SYLLABI

FOR

STANDARDS XI AND XII

(For the Higher Secondary Certificate Examination)

H. S. C. VOCATIONAL SUBJECTS

(Volume I)

ENGINEERING AND TECHNOLOGY GROUP

COMMERCE GROUP

Maharashtra State Board of Secondary and Higher Secondary Education,
Pune – 411004

SYLLABI

FOR

STANDARDS XI AND XII
(For the Higher Secondary Certificate Examination)

(To be implemented in Standards XI and XII from the academic year 2015-2016 and 2016-2017 respectively)

H. S. C. VOCATIONAL SUBJECTS
(Volume I)

1. **Engineering and Technology Group**
2. **Commerce Group**

As sanctioned under Government of Maharashtra School Education and Sports Department.
Letter No.

H. S. C. Competency Vocational Subjects

STANDARDS XI AND XII
SCHEME OF TEACHING

Sr. No.	Subjects	Periods per week		Total
		Theory	Practical	
1.	English	5	--	5
2.	A Modern Indian Language Or A Modern Foreign Language Or A Classical Language	5	--	5
3.	Environmental Education	2	--	2
4.	General Foundation Course	5	--	5
	VOCATIONAL SUBJECT For subjects under - Engineering and Technology Group And Commerce Group			
5.	Paper I	4	8	12
6.	Paper II	4	8	12
7.	Paper III	4	8	12
	Total	29	24	53

CONTENTS

GENERAL FOUNDATION COURSE (90)

Scheme of Examination

Std. – XI

Sr. No	Title of the Paper	Theory		Practical		Visit Report	Student Activity	Oral	Total Marks
		Marks	Time (Hours)	Marks	Time (Hours)				
1	Employability Skill Development	60	$2\frac{1}{2}$	-	-	20	10	10	100
		60	-	-	-	20	10	10	100

Note:

1. 20 marks are allotted for visit reports (Minimum Two visits (course related)) are required.
2. 10 marks are allotted for Student Activity (Every student should prepare, and maintain file)
3. 10 marks are allotted for oral.

Std. – XII

Sr. No	Title of the Paper	Theory		Practical		Project Report	Student Activity	Oral	Total Marks
		Marks	Time (Hours)	Marks	Time (Hours)				
1	Entrepreneurship Development	60	$2\frac{1}{2}$	-	-	20	10	10	100
		60	-	-	-	20	10	10	100

Note:

1. 20 marks are allotted for Project Work (One Project Reports should be prepared by every student.)
2. 10 marks are allotted for Student Activity (Every student should maintaina file)
3. 10 marks are allotted for oral.

Introduction: -

"When the winds of change are blowing, you need to know which way and how fast".

The 'Employability Skill Development' for XI class and 'Entrepreneurship Development' for XII class is a common subject for all the courses under H.S.C Vocational stream. It will help to equip the students to become an entrepreneur or a smart self employed citizen. This will also help them for gaining employment.

This course mainly comprises generic skills, entrepreneurial abilities and basic requirements for trade and commerce. While learning this subject, the student will be able to acquire knowledge about banking, accounting, transportation, communication and management aspects such as self management, team management, quality control, project preparation and time management etc for development and promotion of employability and entrepreneurship skill.

"The businessman is coming to realize that education is to business what fertilizer is to farming".

Objectives:-

To enable the student to:-

(1) Promote self employment ability.
(2) Understand the role of self management through Employability Skill Development.
(3) Learn ethics, values, and interpersonal skill.
(4) Generate awareness about the importance of project work in Entrepreneurial Development.
(5) Get acquainted with career planning, new career opportunities.
(6) Learn about Safety and Health, Time management, Team Management, Financial, Operation & marketing Management.
(7) Acquire basic skills of Business Accounting.
(8) To enable the students to understand working in practical life.
(9) To develop knowledge about Financial Institutions and Government Agencies for encouraging self employment.

Std. XI
Paper: Employability Skill Development
Theory

Sr. No.	Unit	Sub Unit	Periods	Student Activity
1	Self Management	1.1 Identifying one's strength & weakness 1.2 Planning and goal setting. 1.3 Managing self-emotions, ego, pride	10	Every student should prepare a list of self strength and self weakness
2	Time Management	2.1 Time Management, concept 2.2 Attendance, discipline, and punctuality 2.3 Tools to plan the work (Time Management Matrix)	12	Preparation of time schedule of a particular task. a) Work – Game, learning b) Day to day activities
3	Team Building	3.1 Concept of group 3.2 Group dynamics and team building	08	Prepare a group to perform a task.
4	Motivation	4.1 Motivation 4.2 Relationship between needs, drives and goals. 4.3 Objectives of Motivation. 4.4 Classification of Motivation. 4.5 Types of Motivation 4.6 Self Motivation	14	How to motivate a customer for purchasing your product?
5	Ethics and Values	5.1 Concept of ethics and values 5.2 Factors of ethical behaviour. 5.3 Areas of ethical concern 5.4 Remedial measures and laws.	04	Prepare a list of ethics and values socially accepted
6	Interpersonal Skill	6.1 Importance of interpersonal skill 6.2 Positive Relationship, Positive Attitude	09	Group discussion on the interpersonal skill.
7	Stress Management	7.1 Concept of Stress 7.2 Concept of Stress Management 7.3 Causes of Stress 7.4 Methods of stress relief.	08	Arrange a lecture on stress relief – a) Pranayam b) Yoga c) Music exercise etc By using PPT.
8	Interview	8.1 Concept of Interview 8.2 Types of Interview 8.3 Preparation for the interview	14	Arrange a mock interview

		8.4 Dos and Don'ts in an interview		
9	Cross Occupational Competency	9.1 Concept of cross occupational competency 9.2 Organiz and implementation of exercises related to a) Communication and co-operation b) Independency and responsibility.	11	Mock sale and communication used therein for promoting sale.
10	Quality Management	10.1 Meaning of Quality Management 10.2 Concepts of TPM – SGA 10.3 Concepts of TEM, ISO and QMS	12	Arrange a visit to Study Small Group Activity Collect information for ISO certification
11	Safety and Health	11.1 Meaning of occupational safety and health 11.2 Concepts of occupational hazards, hygiene, ergonomic accidents 11.3 Prevention techniques & controling of accidents 11.4 Important Acts related to safety & health 11.5 HIV/AIDS – Safety and precautions	18	Arrange a visit to observe safety precaution Arrange a guest lecture of a Doctor on HIV/AIDS

Std. XII

Paper: Entrepreneurship Development

Theory

Sr. No	Unit	Sub Unit	Periods	Students Activity
01	Entrepreneurial Career	1.1 Need & scope for self employment 1.2 Types of business in different trading sectors 1.3 Importance of skill 1.4 Qualities of good entrepreneur 1.5 Dynamics of entrepreneurship 1.6 Entrepreneurial competencies 1.7 Entrepreneurial goal setting	10	Collect any two success stories of:- entrepreneur/business icons and present it in class room
02	Market Assessment	2.1 Meaning 2.2 Understanding consumer and consumer behavior 2.3 Need and importance of market assessment	12	Conduct actual market survey of any one product

		2.4 Techniques of market assessment 2.5 Market & market segments 2.6 Concept of publicity and advertisement		
03	Project Selection	3.1 Meaning of Project 3.2 Product identification 3.3 Classification of project 3.4 Selection of project 3.5 SWOT Analysis	12	Make SWOT analysis of minimum one project
04	Resource Mobilization	4.1 Meaning of resource and resource mobilization 4.2 Various resources 4.3 Network analysis 4.4 Role of various schemes and institutions for self employment	10	Collect information from various organizations, institutions for self employment schemes i.e. I) DIC II) MCED III) MSSIDC IV) KVIC V) MITCON
05	Project Formulation	5.1 Need for project report 5.2 Elements of project report 5.3 Determining project size 5.4 Selection of place and machineries 5.5 Determining labour and raw materials 5.6 Estimation of project cost 5.7 Break Even Analysis and Profitablility. 5.8 Time schedule, project monitoring and review techniques. (Network Analysis) 5.9 Requirements of banks and financial institutions 5.10 Project Appraisal	20	Prepare a project report on any one project.
06	Initiation of Project	6.1 Procedure for setting of an enterprises as per local requirement 6.2 Registration and legal formalities of firm 6.3 Investment procedure 6.4 Identification of Financial Agencies and bank	09	Identify five licensing authorities business/industry and list out the various license, collect format OR Prepare a dummy loan proposal for business/industry/shop
07	Operation Management	7.1 Concept of Purchasing and Planning materials 7.2 Techniques of material storage analysis a) ABC b) EOQ 7.3 Issue and Accounting of Stores & Materials 7.4 Flow and control of material 7.5 Quality Control and Operation of materials	09	Prepare a report based on issue of material of cottage/small industry/business house.
08	Financial Management	8.1 Book-keeping and Accounting 8.2 Principles of double entry book-keeping	18	Prepare formats of the following a) Journal

		8.3 Understanding financial statement 8.4 Compilation of final accounts 8.5 Cost concept 8.6 Budgetary control		b) Ledger c) Trading Account d) Profit and Loss Account e) Balance Sheet
09	Marketing Management	9.1 Meaning and concept of Marketing Management 9.2 Functions of marketing 9.3 Channels of distribution 9.4 Salesmanship	08	Prepare a layout of an advertisement of any product (Print Media)
10	Industrial Relations and Personnel Management	10.1 Methods and process of recruitment 10.2 Wages and incentives 10.3 Training & appraisal 10.4 Employer and employee relations	06	Prepare an application form with detail bio-data for the post of salesman/clerk/supervisor/ technician/skilled worker
11	Transportation	11.1 Meaning and importance of transport 11.2 Means of transport 11.3 Advantages and disadvantages of transport	06	Prepare a chart of means of transportation and commodities to be transported.

Note:-

1) Subject 'Employability Skill Development' and 'Entrepreneurship Development' should be taught strictly by MBA or equally qualified expert.
2) Each student has to study and prepare one project reports based on concerned vocational course.
3) The sample list of project reports for each group of vocational course is shown in annexure.
4) The project report should be completed under the guidance of MBA or equally qualified expert.

ENGINEERING AND TECHNOLOGY GROUP

1: ELECTRONICS TECHNOLOGY (J1, J2, J3)

Scheme of Examination

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Basic Electricity	80	3	80	3	20	10	10	200
2	Basic Electronics	80	3	80	3	20	10	10	200
3	Digital Electronics	80	3	80	3	20	10	10	200

* IV = Industrial Visits

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Applied and Industrial Electronics	80	3	80	3	10	10	10	10	200
2	Modern Instruments & Communication systems	80	3	80	3	10	10	10	10	200
3	Computer Hardware & Networking	80	3	80	3	10	10	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Introduction

Electronics Technology is one of the important Higher Secondary vocational course under Engineering and Technological group introduced by the state government from the academic year 1988-1989. The state board revised syllabus as per NVEQF (National Vocational Education Qualification Policy). This policy is decided by National Skill Development Corporation (NSDC) under HRD ministry of Government of India to nurture technological advancement & Skill development for job opportunities in various Electronic sectors.

The syllabus of Electronics Technology sector has been evolved in such a way that after completion of the course of two years (Std. XI) [L3] and (Std. XII) [L4] The student would acquire good working skills suited to work as a skilled person in industry. He would also gain knowledge for electronic technician, electronics sales & service.

Objectives

On completion of the course, the student will gain.

- Knowledge of working & operating principles of electronic circuits & equipments.
- Skills for fault analysis and diagnosis of electronic equipment, repair & replacement of faulty parts.
- Skills on assembly, testing, repair, maintenance and installation of electronic equipment.
- Ability to examine schematic layouts wiring diagrams and product details.
- Knowledge of entrepreneurship activities.
- Awareness of safety precautions.

Job Opportunities

After successful completion the course the student can have opportunities in the following fields with acquiring professional skills.

- Audio & TV technician.
- Computer hardware technician.
- Electronics servicing sector.
- Electronic technician.
- Sales & service in consumer electronics.
- Service person in telecom sector.
- Entrepreneur.

Future Education

If student desires he can take admission to direct second year diploma course and also go for higher education.

Std. XI
Paper I: Basic Electricity (J1)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Electrical Safety and Tools	1.1 Electrical Symbols	**22**
		1.2 Electrical safety	
		1.3 Tool Kit	
2.	Introduction to Electricity	2.1 Basic Electrical Terms	**25**
		2.2 Basic Networks	
		2.3 Electrical Laws	
3.	Study of Electronic Components	3.1 Passive Components	**25**
		3.2 Active Components	
		3.3 PCB and Soldering	
4.	Electrostatics	4.1 Electrostatics	**10**
5.	Magnetism and Electromagnetism	5.1 Magnetism	**14**
		5.2 Electromagnetism	
6.	A C Circuits	6.1 AC fundamentals	**12**
		6.2 Resonance	
7.	Electrical Measurements	7.1 Meters	**12**
Total Marks			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Prepare drawing sheet of electrical symbols.	9
2.	Enlist the Safety precautions to be taken in the Electronics Laboratory.	9
3.	Prepare drawing sheet of tools used in the electronics lab.	9
4.	Enlist different voltage sources in the laboratory and note their specifications.	9
5.	Prepare drawing sheet of Active and passive components.	9
6.	Familiarization and use of Ammeter, Voltmeter and Multimeter	9
7.	Verification of Ohm’s Law	9
8.	Verification of Kirchhoff's Current Law.	9
9.	Verification of Kirchhoff's Voltage Law.	9

10.	Identification and testing of Passive components.	9
11.	Study of different types of Switches, relays and Connectors.	9
12.	Identification and testing of Active components.	9
13.	Indentify and draw Pin Configuration of IC's 555,741, 74XX, etc.	9
14.	Prepare layout and PCB of simple circuit like bridge rectifier.	9
15.	Study charging and discharging of capacitor through resistor.	9
16.	Study of series and parallel resistive circuits.	9
17.	Demonstrate solenoid as Electro-magnet.	9
18.	Prepare chart for typical sinusoidal waves for Amplitude, frequency, time period, Peak value, Average value, RMS value.	9
19.	Study of PMMC galvanometer	9
20.	Conversion of PMMC into Ammeter	9
21.	Conversion of PMMC into Voltmeter.	9
22.	Project, Industrial Visit	51
	Total	**240**

Paper II: Basic Electronics (J2)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Semiconductors	1.1 Atomic structure	**15**
		1.2 Semiconducting material	
2.	Special semiconductor diodes	2.1 P-N Junction	**15**
		2.1 Special Diodes	
3.	Power Supplies	3.1 Rectifiers	**25**
		3.2 Filters	
		3.3 Characteristics	
		3.4 Regulators	
4.	Amplifiers	4.1 Transistor	**25**
		4.2 Amplifiers	
		4.3 Multistage amplifiers	
		4.4 Feed backs in Amplifier	
		4.5 Differential Amplifier	
5.	Oscillators	5.1 Basic of oscillator	**20**
		5.2 LC oscillator	
		5.3 RC oscillator	
		5.4 Crystal	
6.	Special Semiconductor devices	6.1 FET	**20**
		6.2 UJT	
		6.3 SCR, Diac, Triac	
Total Marks			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Identification of different types of diodes (LED, PHOTO, PN-junction, ZENER, etc)	9
2.	Testing of diode using analog and digital multimeter.	9
3.	Study of V-I characteristics of PN junction diode.	9
4.	Construct and test Halfwave rectifier.	9
5.	Construct and test Fullwave rectifier.	9
6.	Construct and test Bridge rectifier.	9
7.	Study of LC filter and its ripple factor.	9
8.	Find Line and Load regulation of unregulated power supply.	9
9.	Construct and test Zener diode as voltage regulator.	9
10.	Study of Fixed voltage regulator (using IC-7805/7809/7912 etc)	9
11.	Construct adjustable voltage regulator using IC-LM317).	9
12.	Identification of different types of transistors (UJT, BJT, FET, Power)	9
13.	Study input characteristics of CE transistor configuration.	9
14.	Study output characteristics of CE transistor configuration.	9
15.	Construct Hartley oscillator using transistor.	9
16.	Construct Colpitt's oscillator using transistor.	9
17.	Construct phase shift oscillator using transistor.	9
18.	Study of crystal oscillator.	9
19.	Study of diac, triac, SCR.	9
20.	Study VI characteristics of UJT transistor.	9
21.	Demonstration of FET Amplifier.	9
22.	Project, Industrial Visit	51
	Total	**240**

Paper III: Digital Electronics (J3)
Theory

Sr. No.	Unit	Sub-unit	Periods
1.	Number Systems and Binary Arithmetic	1.1 Number Systems and conversions	10
		1.2 Binary Arithmetic	
		1.3 Codes	
2.	Logic Gates	2.1 Basic Gate	15
		2.2 Derived Gates	
		2.3 Boolean Algebra	

		2.4 Applications of Ex-OR gate	
3.	Logic Families	3.1 Introduction of Logic Families	10
		3.2 TTL Logic Circuits	
		3.3 CMOS Logic Circuits	
4.	Combinational Logic Circuits	4.1 Multiplexer	20
		4.2 De multiplexer	
		4.3 Encoder	
		4.4 Decoder	
5.	Flip-flops	5.1 Introduction to Flip-flop	20
		5.2 S-R flip flop	
		5.3 D flip flop	
		5.4 J-K Flip flop	
		5.5 JK-MS	
		5.6 T Flip flop	
6.	Registers	6.1 Introduction and types of register	10
		6.2 Left shift register	
		6.3 Right shift register	
7.	Counters	7.1 Types of counters	25
		7.2 Ripple counter	
		7.3 Decade counter	
		7.4 Down counter	
		7.5 Up/down counter	
		7.6 Ring counter	
8.	Data conversion	8.1 Need of Data conversion	10
		8.2 DAC	
		8.3 ADC	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Convert binary number to decimal number and vice versa.	9
2.	Convert Hexadecimal number to decimal number and vice versa.	9
3.	Convert octal number to decimal number and vice versa.	9
4.	Subtract binary numbers using 1's compliment method and 2's	9

	compliment method.	
5.	Draw logic diagram for Boolean equation, simplify it by boolean algebra and draw simplified diagram.	9
6.	Indentify IC 7404, 7408, 7432 and verify truth table of all basic gates.	9
7.	Indentify IC 7400, 7402, 7486 and verify truth table of all derived gates.	9
8.	Construct and verify Ex-OR gate using basic gates only.	9
9.	Construct and Prove Demorgan's theorem.	9
10.	Construct basic gates using NAND gate.	9
11.	Construct basic gates using NOR gate.	9
12.	Study of half adder circuit.	9
13.	Study of Full adder circuit.	9
14.	Construct Ex-OR as 4 bit controlled invertors.	9
15.	Construct 4:1 Multiplexer using IC74153 and verify its truth table.	9
16.	Construct 1:4 De-multiplexer using IC74139 and verify its truth table.	9
17.	Construct BCD to seven segment display using IC7447 and verify its truth table.	9
18.	Construct Encoder using IC74147 and verify its truth table.	9
19.	Construct decade counter using IC7490 and verify its truth table.	9
20.	Construct R-2R ladder for 4 bit DAC and test it.	9
21.	Construct and test simultaneous ADC using OPAMP.	9
22.	Project, Industrial Visit	51
	Total	**240**

Std. XII
Paper I: Applied and Industrial Electronics (J1)
Theory

Sr. No.	Unit	Sub-unit	Periods
1.	Operational Amplifier	1.1 Need of OPAMP	30
		1.2 Block diagram OPAMP	
		1.3 Ideal Characteristics	
		1.4 OPAMP Parameter	
		1.5 Linear Applications	
		1.6 Non Linear Applications	
2.	Electronic Timers	2.1 Introduction to IC-555	28
		2.2. Astable multi vibrator	
		2.3 Monostable multi vibrator	
		2.4 Bistable multivibrator	
		2.5 FSK Using 555	
		2.6 Introduction to PWM.PPM,PAM application	

3.	Optoelectronic Devices	3.1 Photo diode	15
		3.2 Photo transistor	
		3.3 LDR	
		3.4 FOC	
4.	Motors	4.1 Motor fundamentals	11
		4.2 Speed control of Motor	
		4.3 Applications	
5.	Modern Electronic Machine	5.1 Copier (Xerox)	14
		5.2 Scanner	
		5.3 Lamination machine	
		5.4 I-card making	
		5.5 Emergency Light	
		5.6 FAX	
6.	Remote Control	6.1 Introduction.	10
		6.2 Ground Station	
		6.3 Remote Station	
		6.4 Applications	
7.	Solar Systems	7.1 Solar Cell	12
		7.2 Applications	
		7.3 Maintenance	
		7.4 Introduction to Solar Power station	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Determination of gain of Inveting amplifier.	9
2.	Determination of gain of Non-Inveting amplifier.	9
3.	Study of Op amp as Adder.	9
4.	Study of Op amp as Subtractor.	9
5.	Study of Op amp as Integrator.	9
6.	Study of Op amp as differentiator.	9
7.	Study of Op amp as Buffer.	9
8.	Study of Op amp as Comparator.	9
9.	Study of Op amp as Schmitt's Trigger.	9
10.	Study of IC 555 in Monostable mode.	9
11.	Study of IC 555 in Astable mode.	9
12.	Study of Optocoupler circuit.	9
13.	Demonstration of solar cells and solar appliances.	9
14.	Demonstration of copier Machine.	9
15.	Demonstration of scanning of document.	9
16.	Construct a circuit of speed control of DC motor.	9
17.	Construct and study FSK using IC 555.	9
18.	Study V- I characteristics of Photo Diode.	9

19.	Demonstration of infra red remote control circuit.	9
20.	Demonstration of FAX machine.	9
22.	Project, Industrial Visit, O.J.T	60
	Total	**240**

Paper II: Modern Instruments and Communication Systems (J2)

Theory

Sr. No.	Unit	Sub-unit	Periods
1.	Transducers	1.1 Introduction	25
		1.2 Resistive Transducers	
		1.3 Capacitive Transducers	
		1.4 Inductive Transducers	
		1.5 Optical Transducers	
		1.6 Active Transducers	
2.	Electronic Instruments	2.1 Introduction	25
		2.2 PMMC	
		2.3 CRO	
		2.4 DMM	
		2.5 Frequency generator	
3.	Electronic Communication	3.1 Analog Communication	25
		3.2 Modulations Satellite Communication	
		3.3 Digital Communication	
		3.4 Fibre –optic Communication	
		3.5 Cell-Phones	
4.	Communication Devices	4.1 Wireless communication devices	08
5.	TV receivers	5.1 TV receivers	22
6.	Consumer Electronic Appliances	6.1 Home Appliances, Commercial Appliances	15
Total Marks			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Study of Themistor NTC, PTC.	9
2.	Use of condenser microphone as a sound transducer.	9
3.	Study and re-coning of the load speaker.	9
4.	Study V-I characteristic of photo cell.	9
5.	Study and use of Optocoupler in any circuit.	9
6.	Construct multirange ammeter using galvanometer.	9
7.	Construct multirange voltmeter using galvanometer.	9
8.	Study the front panel controls of CRO.	9
9.	Measure frequency time period and AC/ DC Voltage using CRO.	9
10.	Measure phase difference using lissageous patterns of CRO.	9
11.	Construct and study AM Modulator circuit.	9
12.	Construct simple diode detector circuit.	9
13.	Construct and study FM transmitter circuit.	9
14.	Installation of DTH.	9
15.	Downloading of various Android Applications for cell phones.	9
16.	Demonstration of Fibre optic communication.	9
17.	Study of television controls.	9
18.	Demonstration of working of LED and LCD TV.	9
19.	Study the working of MP3 music system, Mixer-Juicers.	9
20.	Study the working of Microwave, Washing machine, Air conditioner.	9
21.	Project, Industrial Visit, O.J.T.	60
	Total	**240**

Paper III: Computer Hardware and Networking (J3)
Theory

Sr. No.	Unit	Sub-unit	Periods
1.	Introduction to Microprocessor and Organization of 8085	1.1 Introduction and Evolution of microprocessor	18
		1.2 Basic Blocks of microprocessor	
		1.3 Architecture of 8085 microprocessor	
		1.4 Functional pin diagram of 8085	
2.	Instruction Set and programming of 8085	2.1 Addressing modes of 8085	23
		2.2 Instruction set of 8085	
		2.3 Interrupts in 8085	
		2.4 Assembly language Programming	
3.	Microprocessor X-86 Family	3.1 Introduction to advance microprocessor	12
		3.2 Introduction to X-86 microprocessor	
		3.3 Attributes of X-86 family	

		3.4 Programming model of X-86	
4.	Microcontrollers	4.1 Introduction to Microcontroller	12
		4.2 Advantages over microprocessor	
		4.3 Architecture of 8051	
		4.4 Overview of other microcontrollers	
		4.5 Applications of microcontrollers	
5.	Networking Technology	5.1 Study of transmission Lines	20
		5.2 Network topologies	
		5.3 Protocols	
		5.4 Introduction to connectivity devices	
6.	Fundamentals of Computer	6.1 Basic blocks of computer	20
		6.2 Memories in Computers	
		6.3 Overview of motherboard	
		6.4 Specifications of Computer	
7.	Operating Systems	7.1 Introduction to operating systems	15
		7.2 Services in OS	
		7.3 Overview of windows-98, windows-NT	
		7.4 Access and Security aspects of OS	
Total Marks			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Drawing Sheet of Architecture and pin diagram of 8085 microprocessor.	9
2.	Drawing Sheet of microprocessor Kit.	9
3.	Introduction to operate microprocessor 8085 kit	9
4.	Write a program to store data by different instructions.	9
5.	Draw flow chart and write a program of simple addition (direct addressing mode).	9
6.	Draw flow chart and write a program of simple addition (indirect addressing mode).	9
7.	Draw flow chart and write a program of simple subtraction (direct addressing mode).	9
8.	Draw flow chart and write a program of simple subtraction (indirect addressing mode)	9
9.	Write simple program to study Logical and branch instructions.	9
10.	Write a program to find largest number.	9
11.	Write a program to find Block Move.	9
12.	Write a program to find smallest number.	9
13.	Write a program to exchange that contains two blocks.	9
14.	Write a program to multiply two numbers.	9
15.	Write a program to study PUSH-POP instructions.	9
16.	Write a program to study SIM-RIM instructions.	9

17.	Drawing Sheet of Architecture of 8051 microcontroller.	9
18.	Draw the sheets of different connectivity devices like Modem, Hub, Repeaters and Routers.	9
19.	Draw the sheets of LAN,MAN, WAN	9
20.	Draw the sheets of Network topologies (Star, Bus, Ring)	9
21.	Project, Industrial Visit, O.J.T.	60
	Total	**240**

List of Reference Books (XI and XII)

Electronics Technology

Sr. No.	Author	Title	Publisher
1.	V. K. Mehta	Principles of Electronics	S. Chand & Co.
2.	B. L. Theraja	Basic Electronics	
3.	Madhuri Joshi	Electronic Components and Materials	Shroff Publishers & Distributors Private Ltd.
4.	Walter C. Bosshart	Printed Circuit Boards	Tata McGraw Hill
5.	Paul Malvino	Electronic Principles	Tata McGraw Hill
6.	R.S. Sedha	Applied Electronics	S. Chand & Co.
7.	Allen Mottershed	Electronics Devices & Circuits	Prantice Hall India Ltd
8.	A. K. Sawhney	Electrical & Electronic Measurements & Instrumentations	Dhanpat Rai & Co.
9.	W.D. Cooper	Modern Electronic Instrumentation & Measurement Techniques	Pearson Education, New Delhi
10.	N.N. Bhargava, D.C. Kulashreshtha, S.C.	Basic Electronics & Linear Circuits	Tata McGraw Hill
11.	David J. Bell	Electronics Devices & Circuits	Prentice Hall of India
12.	Malvino & Leach	Digital Principles and Applications	TMH
13.	R. P. Jain	Modern Digital Electronics	TMH

14.	Malvino	Digital Principles	Tata McGraw Hill (TMH)
15.	Ramakant A. Gaikwad	O-Amp & Linear Integrated Circuits	Prentice-Hall of India, New Delhi
16.	K. R. Botkar	Integrated Circuits	Khanna Publisher, New Delhi
17.	D. Balasubramanian	Computer Installation & Servicing	Tata McGraw Hill
18.	J. Millman and H. Taub	Pulse Digital & Switching Waveforms	Tata McGraw Hill
19.	Floyd	Digital Fundamentals	Universal Book Stall New Delhi
20.	M. Morris Mano	Digital Logic and Computer Design	PHI
21.	Ramesh S. Gaonkar	Microprocessor Architecture, Programming and Applications with 8085	Penram International
22.	B. Ram	Fundamentals of Microprocessors and Microcomputers	Dhanpat Rai Publications
23.	Alberrt Malvino	Electronic Principles	Tata McGraw Hill
24.	Grob Bernard	Basic Electronics	Tata McGraw Hill
25.	G. K. Mithal	Industrial Electronics	Khanna Publications
26.	S. Ramabhadran	Principles of Communication	Khanna Publications
27.	A. M. Dhake	Television Engineering	Tata McGraw Hill
28.	J. Kennady	Principles of Communication	
29.	A. P. Mathur	Introduction of Microprocessor	Tata McGraw Hill
30.	Frenzel	Communication Electronics, Principles and application	Tata McGraw Hill
31.	B. Grob	Basic T.V. and Video Systems	Tata McGraw Hill
32.	R.R. Gulati	Modern TV Practice	New-Age International
33.	Govind Rajalalu	IBM-PC and clones	
34.	Jeff Heeth	Understanding fibre optics	BPB New Delhi

TOOLS AND EQUIPMENTS

Sr. No.	Specification	Quantity
1	Neon Tester 500V	10
2	Soldering iron 25 W. 240 V.	10
3	Screw driver set (set of 5)	5
4	Insulated side cutting pliers 150 mm	5
5	Insulated combination pliers 150 mm	5
6	Long nose pliers 150 mm	5
7	Tweezers 100 mm	5
8	Digital Multimeter	10
9	Analog Multimeter	10
10	Electrician Knife	10
11	Soldering Iron Changeable bits 25 W	2
12	Soldering Iron 10 W	2
13	IC plucker	2
14	Server Computer (Tower Model)	1
15	Desktop Computer Latest Configuration	5
16	Printers: Laser	1
17	5KVA online UPS	1
18	LAN Cards	5
19	LCD/DLP Projector	1
20	Pen Drives	3
21	External Hard Disk	1
22	Card Reader	2
23	Router	1
24	CRO (Minimum 20MHz Dual Trace with CT)	3
25	Function Generator (Up to MHz with all Functions)	3
26	Dimmerstat (0-300 V)	2
27	Audio Amplifier systems with Equalizer, Speaker and microphone	2
28	Galvanometer	5
29	DVD player	1
30	Digital Frequency Meter	1
31	A.F. Signal Generator	3
32	Solar panel for light/heat	1
33	RPM counter	1
34	Digital IC trainer kits	1
35	DC regulated power supply (0-30) V, 1A	10
36	Mobile Android	1
37	Microprocessor 8085 Kit	5
38	Emergency Lamp	2
39	Lamination M/c	1
40	Computer Speaker, Head phone, Webcam	1
41	PCB drill machine with drill bit	1

42	DTH setup	1
43	LED/LCD TV with remote	1
44	MP3 music system	1
45	DC-Volmeters (range 0-1/10/25)	Each – 2
46	DC-Ammeters (range 0-1/10/100/500mA)	Each – 2
47	Breadboard	5
48	De toy motor	2
49	Rheostat	3
50	Allen Key Set	2

Note: Raw material/consumable material required as per practicals can be purchased.

List of Electronic Components

1. Passive components
   a. Various carbon resistors of different wattages
   b. Wire wound resistors
   c. Metal film resistors

2. Variable resistors (Pots) Lin, Log carbon and Wire wound resistors

3. Themistor (NTC, PTC)

4. Photo resistors

5. Active components Power diode, Photodiode, semiconducting diode, Zener diode, LED
   Transistors – NPN = BC147, BC148, BF194, 2N3055
   PNP = AC126, AC176

6. Integrated Circuit – IC 555, IC 741, IC 74XX Series, IC 317, IC 340, IC 78XX, IC 79XX

7. Switches as per required

8. Relays

9. Connectors

10. Connecting Wires

11. Soldering Material

12. Flux

13. Electric board

14. Banana pins

15. Copper Clad

16. General purpose PCB

17. $FeCl_3$

18. Capacitors Ceramic Electrolytic

19. Inductors – As per requirement

20. Transformers – As per requirement

21. Resistance box

22. Electromagnet

23. Crystals

24. Diac

25. Traic

26. SCR (Silicon Controlled Rectifier) SN 100

27. UJT (Uni junction transistor) 2N2646

28. FET (Field Effect Transistor) BFT10/11

29. Loud speakers

30. Fiber Optic cable

31. Microphone

32. Photocell

33. Optocoupler

2: ELECTRICAL TECHNOLOGY (T4, T5, T6)

Scheme of Examination

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Electrical Wiring	80	3	80	3	20	10	10	200
2	Electrical Appliances	80	3	80	3	20	10	10	200
3	Electrical Machines	80	3	80	3	20	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Electrical Wiring	80	3	80	3	10	10	10	10	200
2	Electrical Appliances	80	3	80	3	10	10	10	10	200
3	Electrical Machines	80	3	80	3	10	10	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Introduction

All India Council for Technical Education, (AICTE), the apex body for making and maintaining the norms of Technical Education in the country has framed a National Vocational Education Qualification Framework (NVEQF) for the polytechnics and Engineering Colleges.

NVEQF is introduced by Government in order to formally integrate vocational education together with its current conventional educational streams across school and higher education space and provide an opportunity and incentive to students to explore a large universe of opportunity.

It is important that a Vocational Educational Qualification Framework is in place that allow cross mobility of standards and their absorption in Industry with certain skill gained over a fixed period of time or their seamless integration into higher learning that enable them to acquire formal degree and higher skill so that they perform higher level jobs in industry.

The erstwhile Directorate of Vocational Education has gone for NVEQE based curriculum development.

Each curriculum provides a list of Job opportunities (both wage and self) and description of each job. The objective of the course, scheme of studies and examination pattern, syllabus are given.

The present competencies based curriculums on “Maintenance and Repair of Electrical Domestic Appliances - M.R.E.D.A.” and “Repair, Maintenance and Rewinding of Electrical Motors- R.M. & R.E.M. was implemented through Maharashtra State Board of Secondary and Higher Secondary Education, Pune after upgrading them since 2007-08. The two curriculums were falling short to fulfill the needs of Indian as well as foreign industries. To overcome this difficulty different group of expert worked to have a job and self employment generating opportunity by clubbing the two curriculums developed curriculum of Electrical technology vocational H.S.C. course likely to be equivalent to NVQEF level III and IV. The Group of Experts comprised of DVET officials, Experts from industries and Teachers and Instructors teaching to these two curriculums.

The suggestions by the various experts in the field of vocational education and industries will be greatly valued and will go a long way in bringing out a revised version after reviewing by them.

Objectives

- To make students familiar with shop discipline, layout of electrical shop, safety practice.
- To acquire knowledge and skills about safety precautions while working.

- To acquire knowledge about function and use of various electrical tools, equipments and accessories.
- To acquire with properties and usage of different materials (conducting, insulating, wiring etc.)
- To know about electrical symbols of commonly used electrical parts.
- To develop knowledge about the wiring.
- To get introduced to electrical shop to classify different tools machines and equipments.
- To acquire skills for wiring methods.
- To develop knowledge about the wiring.
- To do any type of wiring such as house, industrial, commercial wiring.
- To know about planning layout, setting and up keeping of electrical Interactive Lecture, Workshop/Lab, Self-performed.
- To get knowledge about estimation, costing and billing of wiring.
- To ACQUIRE the detail knowledge of Electrical, Mechanical, cutting and holding tools various machines with their specific use handling and maintenance and precaution while handling.
- To UNDERSTAND how to work on electrical installation and shop floor safety precautions maintenance and upkeep
- To CREATE an awareness about all electrical domestic appliances
- To Develop technician skills in the field of dismantling, Servicing, Overhauling, Maintenance, testing and reassembling of electrical appliances.
- To ACQUIRE the skill in sales and marketing of the latest domestic appliances, equipment, spare parts and raw materials.
- To GAIN the knowledge and skill of motors transformer repairing, servicing and overhauling.
- To become a wire man / electrician with the details of installation, repairing and maintenance of commercial / industrial / house wiring.
- To obtain the detailed skills of reconditioning, repairing, charging and maintenance of various types of batteries, UPS, Invertors.
- To GROW UP as a first generation entrepreneur from non-business family.
- To participate in the development of country not as an employee but as an employer
- To RISE UP as a TECHNOCRAT with ability to take Higher Vocational Education.
- To make students familiar with winding shop discipline, layout of electrical winding shop, safety practice.
- To acquire knowledge and skills about safety precautions while winding.
- To acquire knowledge about function and use of various electrical machines, instrument equipments and accessories.
- To acquire with properties and usage of different materials (conducting, insulating, winding etc).
- To develop knowledge about the winding.

- To acquire skills for winding methods.
- To develop knowledge about the winding.
- To do any type of winding such as motor, transformer winding.

Job Opportunities

Wage Employment

- Technician in local government bodies Corporation, Star Hotels, Electricity Board, co-generation plants, factories, Industries, Townships.
- Wire Man
- Electrician
- Instructor in technical institution
- DG Set Operator
- Lift Operator
- Electrical Supervisor
- Technical writer
- Technician in Banks, IT Industries, General Industries
- Electrical domestic Appliances Assembler
- Electrical Domestic Appliances Tester
- Electrical domestic Appliances repairer
- Electrical Domestic Appliances Service Technician
- Electrical Domestic Appliances salesman
- Electrical Domestic Appliances Demonstrator
- Insurance Surveyor
- Lifts-hoists service Technician
- Pump Mechanic
- Motor rewinder
- Wireman Panel wiring
- Industrial Insurance Surveyor

Self-employment

- Dealership and agency of MNC-EDA
- Owner of EDA Repair shop
- Owner of after sales shop
- Owner Assembly shop of o Electrical Appliances
- Proprietor Service centre for electrical appliances
- Proprietor Service centre for Electric motors
- Free-lance Service Technician
- Proprietor Installation and maintenance services of electrical Machines

- Contractor of domestic, industrial, hotels, banks, hospital, commercial shop, BPO, IT Company, Mobile Tower Maintenance
- Sales shop of electrical items, Batteries
- Owner Generator Set
- Servicing of UPS / Invertors / Batteries
- Owner Generator Set
- Servicing of UPS / Invertors / Batteries
- Licensed electrical Contractor

Std. XI
Paper I: Electrical Wiring (T4)

Objectives

To enable the students to

1) Acquire knowledge and skills about safety precautions while working.
2) Identify and to use different tools used in wiring.
3) All units with properties and usage of different materials.
   (Conducting Insulating, Magnetic, Instructural, Wiring etc)
4) Understand the general concept of Generation of electrical power.
5) Understand the general concept of different wires.
6) Know about electrical symbols used in electrical parts.
7) Know about electrical house wiring.

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Safety Precautions and shock treatment	Shop Discipline	10
		Electrical shocks and procedure for separating person from contact with live wire	
		First Aid different methods of artificial respiration	
		Electric fire	
		Fire Extinguishers	
2.	Electrical common tools	Electrical tools	10
		Pliers, Combination, side cutting, round nose, long nose,	

		Screw drivers, connectors, electrical knife	
		Neon tester, test lamp, series test lamp, pincer, line dori, plumb bob, steel rule, Tenor saw, Hacksaw, Hammer	
		Symbols uses in Electrical technology	
		Reading of electrical drawing	
3.	Current Electricity	Introduction, Generation of electricity, Types of electricity, Effect of electricity and appliances, Different energy sources, EMF, potential difference, current, voltage, resistance, conductance, power, energy, specific resistance, energy billing for a month, direct current and alternating current	10
4.	DC Circuits	Ohm's law, Series CKT, Parallel ckt, series and parallel combination, types of electrical ckt	10
5.	AC circuits	Introduction importance, star delta, capacitor, Fundamentals of AC circuits, Introduction of different ckt, power factor, classification of materials, cables, wires, and insulation low, medium, high voltage	22
6.	Fuse and soldering	Introduction, common fusing material, miniature circuit breaker, (MCB), molded case circuit breakers (MCCB), earth leakage ckt breaker (ELCB), Soldering equipments, precautions	10
7.	Common electrical wiring accessories	Wiring accessories, lamp holders, other accessories, distribution boards, types of wirings, types of wires	12
8.	Domestic wiring (house wiring)	Introduction and necessity of wiring, selection of wiring, types of wiring, I.E. rule of domestic wiring, testing and installation of domestic wiring. Earthing formats for electrical connections	24
9.	Illumination	Introduction, lighting and fixtures	12
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Safety measures to be observed followed in the electrical workshop	4
2.	Demonstration of elementary first aid	12
3.	Personal protection basic injury prevention basic first aid safety signs for danger, warning & caution	8
4.	Artificial respiration techniques of separating person in contact with & live wire	8

5.	Demonstration of use of fire extinguishers	8
6.	Demonstration of trade hand tools	6
7.	Use of crimping tools	8
8.	Measurement of current voltage of power of a appliances	8
9.	Calculate the bill of electricity for one month domestic use	8
10.	Verification of Ohm's Law	8
11.	Measurements of power of a appliance / circuit	8
12.	Calculation of unknown resistance V.I Method & Multimeter method	8
13.	Connecting of lamp in series	4
14.	Connecting of lamps in parallel circuits study of Resistance inductance	8
15.	Practical on P.F improvement of power factor	4
16.	Demonstration and identification of different types of wires & cables	8
17.	Demonstration and practice of using standard wire gauge	4
18.	Demonstration of cable joining kit	4
19.	Skinning the cable and joint practice on single and multistrand wire (straight married and pigtail joint)	8
20.	Market survey of electrical accessories	8
21.	Identification and use of writing accessories	8
22.	Practice one installation of common electrical accessories such as switch, holder, plug on board	8
23.	Two lamps controlled by two independent single pole switch	12
24.	Practice of conduit and concealed on stair case wiring	
25.	Installation and wiring connection of ceiling fan exhaust fan, geyser, water purifier	12
26.	Measurement of insulation resistance of new house wiring by using megger	12
27.	Practice of pipe & plate earthing	12
28.	Practical on electrical tube connection & testing fault & repair	8
29.	Industrial visit	12
	Total	**240**

Paper II: Electrical Appliances (T5)

Objectives

To enable the students to

1) Understand the working principle and construction of common domestic appliances
2) Know the cause of faults in these appliances
3) Acquire skills of testing and repairs of appliances
4) Know the working and construction of cells of batteries
5) Know the students about manufacturing of different appliances.

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Testing Equipments & basic control equipments	Switch, fuse, line tester, electronic line tester, series test lamp for single phase, parallel test lamp for single phase, series test lamp for three phase, parallel test lamp for 3 phase, thermostat, bimetallic relay, thermocouple, overload switch, electromagnetic relay, MCB	10
2.	Electric iron	types of electric irons, ordinary, automatic, steam, spray, laundry	8
3.	Tea/ coffee maker	Electric kettle, coffee percolator, electric coffee mug/stirrer,	6
4.	Electric induction cooker	Electric induction plate cooker, simple rice maker	8
5.	Electric toaster	Ordinary, sandwich, pop up automatic	6
6.	Oven and tandoor	Oven, tandoor maker, Micro wave oven	6
7.	Water purifier	UV/RO, UV light effect on bacteria, reverses osmosis membrane process.	8
8.	Rectifiers and filter ckt	Rectifier, P type N type, Half wave, full wave, bridge rectifier	8
9.	Filter ckts and voltage regulator	Filter ckt, T-L, Pie types, voltage regulator IC	8
10.	Emergency Torch	Miniature lamp type, Farmers torch	8
11.	Battery charger	Battery charger ckt and different components	8
12.	Water boilers and geysers	Types of water boilers and geysers, corner, vertical, horizontal, market survey	12
13.	Cells & batteries	Types of secondary cells, cell in series and parallel, lead acid battery,	16
14.	Project	Project of above appliances	8
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Study precautions testing & repair of line tester parallel & series test	4

	lamp Study of application of heat control equipment such as thermostat bi metallic relay thermocouple	4
2.	Study of and application of over load switch, MCB, ELCB, Electromagnetic relay	4
3.	Dismantling reassembling testing and repairs ordinary laundry iron	12
4.	Dismantling reassembling testing & repairs electric tea / coffee maker	12
5.	Dismantling reassembling testing & repairs electric toaster	12
6.	Dismantling reassembling testing & repairs electric oven and tan door maker	12
8.	Dismantling reassembling testing & repairs electrical microven oven electrical	16
9.	Installation dismantling reassembling testing & repairs of UV & RO	16
10.	Study types of diodes	12
11.	Assemble & test bridge type rectifier with & without filter circuit	16
12.	Dismantling , reassembling testing & repair of emergency former torch	16
13.	Dismantling reassembling testing & repairs of car battery charger	16
14.	Dismantling reassembling testing & repairs of water boilers vertical / horizontal	16
15.	Study construction maintenance of lead acid cell battery	20
16.	Comparative study of above application according to market survey	16
17.	Visit above domestic & commercial appliance services & repair shop	16
	Total	**240**

Paper III: Electrical Machines (T6)

Objectives

To enable the students to

1. Understand the student to use & principle of different measuring electrical Instruments
2. Know various magnet & electromagnet.
3. Know various D.C. Motors construction, working principle & its application.
4. Know various single phase transformer construction principle and transformer equation & small transformer rewinding.
5. Know various single phase motors, construction working principle, applications.
6. Know various speed controls of single phase motors.
7. Students able to rewinding the different single phase motors
8. Students able to estimating, coasting and Billing

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Measuring instruments	Introduction, types of measuring instruments, analog and digital, ammeter, voltmeter, wattmeter, multimeter, Ohm-meter, frequency meter, clip on meter, energy meter, tachometer, megger, earth resistance tester	9
2.	Electromagnetism	Introduction, types of magnets, basic magnetic terms, electromagnet, difference between permanent and electromagnet, magnetic rules, right hand rule, cork screw rule, end rule, dynamically, statically, mutual induction	12
3.	D.C. motor	Introduction of D.C. motor, working principle, construction, types of D.C. motors, necessity of starters, types of starters	15
4.	Single phase Transformer	Introduction, types of transformer, transformation ratio, rewinding, transformer testing	12
5.	Single phase A.C. motor	Introduction, working principles, types of single phase motor, construction, working principles, speed control and change of DOR, lubricants, testing of single phase motors, fault finding and trouble shooting, study of data sheet and up keeping of motor	15
6.	Single Phase A.C. motor winding	Introduction types of single phase motor winding, fundamental definitions, winding tools and equipments, winding materials	15
7.	Rewinding Procedure	Name plate data, inside data, method of removing burn coil and rewinding procedure, varnishing and baking methods, winding problems and developed diagram	30
8.	Estimation, costing and billing	Elements of estimation, elements of costing, billing	12
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Measure the power of single phase resistive load by V.I method	12
2.	To test single phase energy meter with the help of standard wattmeter & stopwatch	8

3.	Identical of magnetic & non – magnetic materials	8
4.	Verification of target & development in current carrying coil in a magnetic field	8
5.	Connection of D.C motor to suitable starter & measure current, voltage & speed	8
6.	Identical of terminal by measuring resistance of field & armature of D.C motor	12
7.	Practical on simple transformer test, continuity short circuit & earth of primary & secondary winding	12
8.	Practice on small / transformer rewinding & verify voltage and current ratio	16
9.	Measure the insulation resistance between winding to core of single-phase transformer	8
10.	Identification of starting and running winding of single phase motor by measuring resistance with the help of multimeter	8
11.	Measure the insulation resistance of single phase motor by using & megger	8
12.	To study the parts of single phase motor, test capacitor by screw driver & multimeter method	12
13.	To start run reverse capacitor start & capacitor run motor measure the current voltage & speed	8
14.	Dismantle and study of carbon brush, and commulator of universal motor reassemble it, start run reverse universal motor measure the current voltage speed.	8
15.	Visit to rewinding shop & prepare detailed report	8
16.	Nothing data of burnt motor and remove burnt coils and clean the slot	8
17.	Insulate the slot and prepare new coils as per old coils test the rewinded motor & insert wedges in the slots	16
18.	Find out start and end terminals & tapping, binding shaping of coils	
19.	Inserting the coils and making connection as per developed diagram, varnishing & baking	16
20.	Assembling a motor and start it after rewinding	12
21.	Study concentric winding in split phase motor	12
22.	Market survey the cost size and specification of winding materials	12
23.	Estimation, costing & billing of single phase AC motor winding	12
24.	Visit to winding and repairing shop of motor	8
	Total	**240**

Std. XII
Paper I: Electrical Wiring (T4)

Objectives

To enable the students to

1. Acquire knowledge and skill about industrial and commercial wiring.
2. Identify and uses of different tools.
3. Understand planning, estimation and costing of industrial and commercial wiring.
4. Know about generation and transmission of electrical power.
5. Know about HT and LT substations
6. Know about different workshop tools and uses

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Industrial and commercial wiring	Introduction	24
		Study of Layouts and wiring diagram	
		Power circuit	
		Street light circuit	
		Control panel wiring	
		Protective Devices	
		Load Balancing of 3 phase supply	
		Troubleshooting and maintenance of wiring system of office	
		Maintenance & repair of commercial/Industrial wiring	
		IE rules	
		Testing of commercial/industrial wiring with megger	
		Earthing	
		Plate and rod type earthing	
		Pipe earthing	
2.	Planning estimation and costing of industrial and commercial wiring	Introduction	16
		Estimation, costing and bill	
		Elements of estimation	
		Proforma for estimation and costing	
		Elements of Costing	
		Material, Labour, Expenses, Methods of costing	
		Content of invoice proforma of invoice	
		Tenders	
3.	Generation and transmission	Importance of electrical power in day to day life	24

		Methods of power generating	
		1) Hydroelectric power station	
		2) Thermal power station	
		3) Nuclear power station	
		4) Solar power generation	
		5) Wind power generation	
		Co- generation	
		Need of co- generation	
		Types of co-generation	
		Topping cycle	
		Bottoming cycle	
		Power system layout types of power transmission system	
		Transmission voltages	
		Types of insulators used in transmission line	
		Lighting arrestor	
4.	HT and LT substation	Introduction	24
		Protective Devices	
		Switch gears	
		Introduction to layout and maintenance schedule	
		Single line diagram	
5.	Illumination	Circuit study installation and application of illumination sources	16
		Mercury, Vapor lamp	
		Sodium Vapor lamp	
		Metal halide lamps	
		LED Based modern lighting fixtures	
		Decoration lighting	
6.	Electrical services interactive lecture workshop lab, self performed	Introduction	16
		Classification of tools	
		Electrical hand tools	
		Mechanical hand tools	
		Cutting and holding tools	
		Application of other tools	
		Application of machines	
		Application of instruments	
		List of equipments	
		Raw materials	
		Planning, Layout and setting of electrical lab self performed	
		Up keeping of electrical shop	
		Safety precaution and measures	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Demonstration on wiring with pvc channel	8
2.	Practice and concealed wiring	8
3.	Practice on surface wiring	8
4.	Measurement of insulation resistance of wiring insulation by using megger	8
5.	Continuity and polarity test by using megger	8
6.	Bus bar MCBs, Elcbs, fuse and DB with cable, gland, fixing in wiring installation.	8
7.	3 phase load balancing	8
8.	3 phase energy meter installation	8
9.	Estimate the cost of material and labour charges required as per market rate.	12
10.	Site visit on installation of different wiring system for office/commercial complex/malls/bank/lodge/hospital.	12
11.	Study of protective device used in power supply and its function	8
12.	Practice on operation estimation and costing of materials and accessories as per layout of industrial wiring	8
13.	Preparation of project report of electrical workshop/lab self performed	8
14.	Installation of DTH wiring	8
15.	Installation of CCTV wiring	8
16.	Installation of different chaser lighting circuit	8
17.	Workout measurement of a building or a shop and prepare the list of item for wiring.	12
18.	Prepare the list of item required for	8
	wiring with specification Visit to generation station and prepare detailed report. Visit to 33kv/132kv substation & Prepare detailed report. Visit 11Kv.440v transformer (DP) and prepare detailed report	8 12
19.	Three Phase load balancing	8
20.	To study protective device in substation	8
21.	Circuit study installation and application of Illumination sources	8
22.	Circuit study installation and application of mercury vapor lamp, sodium vapour lamp and metal halide lamp	12
23.	Circuit study, installation and application of LED based modern lighting fixtures and decoration lighting	8
24.	Electrical interactive lecture workshop/lab self performed and one apartment and one commercial complex.	8
25.	Industrial visit (minimum Three visit)	12
	Total	**240**

Paper II: Electrical Appliances (T5)

Objectives

To enable the students to

1. Understand the principle and uses of different testing and control equipments.
2. Understand the working principle, construction, and uses of different electrical domestic electrical appliances.
3. Acquire skills, testing and repairing of electrical appliances.
4. Know the working principle and construction of stabilizer, mixer, inverters, Refrigerators, washing machines, room cooler, air conditioners etc.
5. Know the functioning of craft, crane and lift.

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Testing of Equipment and basic control equipment	**Testing instruments**	16
		Tester, Continuity tester, Test lamp, growlers	
		Measuring Instruments	
		R, V, I, W, KWH, IR, HZ, COSΦ, KVA	
		Control equipments	
		Control Switch, Fuse, Thermostat overload Relay MCB, Timer, ELCB	
2.	Heat Convertor (Blower Type)	Introduction	4
		Construction	
		Working Principal	
		Overhauling & precaution	
3.	Electric Hand drill machine	Ordinary Hammer tone, controlled speed DOR	6
4.	Introduction to power tools	Electric cutter grinder Hammer-chippers	6
5.	Ordinary Blender Mixer/Food procedure	Lassi Maker, Food procedure, juicer Attachment, food procedure, mixer single speed three speed	8
6.	Domestic Vacuum Cleaner	Carpet cylindrical type wet type up right type	6
7.	Different types of electrical fans	Car fan/ cabin fan table fan, pedestal fan, wall mounting fan, Blow/sprinkler fan ceiling fan, exhaust fan, exhaust cum fresh air fan	18
8.	Domestic floor	Ordinary Hammer tone, controlled speed DOR	4

	mill		
9.	Transistor	as a switch type of configurations common emitter amplifier, introduction to basic component LED Photo diode bridge zener diode, PNP-NPN transistor SCR UJT DIAC, TRAIC, LDR POT, Electrolytic Cap, Resistance Colour code	8
10.	Hand Dryer	Sensor used different types of sensor	4
11.	Emergency Light	Led/CFL fluorescent tube type	4
12.	Refrigerator	Refrigerator Deep Freezers	4
13.	Washing Machine	Ordinary Semi auto, Agitor, Drum, Pulsator, Side loading, Timer & value	6
14.	Room Cooler	Pillar, Window mounting table mounting semi-auto	4
15.	Types of stabilizers inverter, Home protector, UPS, Online Offline	VA capacity, selection, connections, Installations, working with block diagram	6
16.	Air Conditioners	Functioning & Installation	4
17.	Craft, Crane, Lift	Functioning	4
18.	Project on above appliances		8
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Dismantling, resembling techniques of testing instruments	4
2.	Study, Precautions, testing and repair of line tester, parallel & series test lamp for single phase supply and three phase supply.	8
3.	Precautions while using measuring instruments R, V, I, W, KWH, IR, HZ, COS$, KVA, O	4
4.	Study, Dismantling, reassembling, up keeping, testing and repair of heat convector.	8
5.	Study, reassembling, up keeping function owning precaution, testing and repairs of electric hand drill machine	8
6.	Study, reassembling, up keeping function owning precaution, testing and repairs of electric power tools cutter, grinder, hammer	8
7.	Survey of power tools such as hammer/cutter/grinder machines of different make as projects.	8
8.	Dismantling reassembling up keeping testing & repairs blender, juicer, grinder.	8
9.	Dismantling reassembling up keeping testing & repairs mixer/food processor (3/6 speed)	12
10.	Dismantling reassembling up keeping testing & repairs of domestic vacuum cleaner car/pot/cylinder/wet/up-right.	12

11.	Study, dismantling, reassembling, installation, testing and repairs car fan/cabinet fan	12
12.	Study, dismantling, reassembling, installation, testing and repairs car fan/pedestal fan	8
13.	Study, dismantling, reassembling, installation, testing and repairs ceiling fan/exhaust fan	8
14.	Installation techniques, precautions, dismantling, up keeping, resembling, testing and repairs of domestic floor mill	8
15.	Study of transistor biasing PNP, NPN and transistor as a switch	8
16.	Study of basic components testing and symbols	8
17.	Study of transistor as amplifier in common emitter configuration	8
18.	Dismantling, resembling. testing and repair of hand dryer	8
19.	Study, testing, repairs, assembling of emergency CFL light	8
20.	Study, testing, assembling of refrigerator/deep freezer	8
21.	Study, testing, repairs, assembling of washing machine ordinary / semi / automatic	12
22.	Dismantling, resembling, up keeping, testing and repairs of room cooler window, table pillar	12
23.	Study, selection, testing & repairs, installation of UPS, Stabilizers	8
24.	Study, selection, testing & repairs, installation of inverters	8
25.	Study, functioning, up-keeping, testing & installation of air conditioner	12
26.	Study, functioning, up-keeping, testing of hoist, crane & lift	8
27.	Visit exhibition to market survey	8
28.	Study of advanced appliance and detailed report	8
	Total	**240**

Paper III: Electrical Machines (T6)

Objectives

To enable the students to

1. Understand the student about three phase transformer construction and working principle.
2. Know the construction working principle and various types' three phase AC motors.
3. Students should rewinding the three phase motors.
4. Know about electrical pumps maintenance and repairs.
5. Know about different starters and relay settings.

Theory

Sr. No.	Unit	Sub-Unit	No. of Periods
1.	Three phase Transformer	**Introduction**	20
		Working Principle construction of Transformer,	

		connections of transformer	
		distribution and power transformer	
		Transformer testing and maintenance	
2.	3phase AC MOTOR	Types of motor construction	22
		Working principle of poly phase motor (asynchronous motor)	
		Speed control of three phase motors	
		Testing and repairing	
		Installation and commissioning	
3.	Three phase AC motor winding	Fundamental winding terms	30
		Types of winding	
		Introduction of modern winding machine	
		Rewinding procedure of AC machines	
		Different types of winding data and its developed diagrams	
4.	Control circuits	Basic Controllers	16
		Some important definitions	
5.	Electric Pump	Working Principle	16
		Types of pumps	
		Maintenance & repairing of pumps	
6.	Motor starters and Relay setting	necessity of starter	16
		Procedure of relay setting in starter	
		Types of AC motor starter-Construction, working principle and uses of AC motor Starters 1) DOL starter 2) Fully automatic star-dela starter 3) Auto transformer starter 4) Rotor Resistance starter 5 Mobile remote control starter their ckt (connection) diagram.	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Dismantling reassembling techniques of testing instruments	12
2.	To study of 3 phase transformer for its various connections i.e. star/star, star/delta, delta/star, scot	12
3.	Visit to transformer manufacturer	12
4.	Connect, start, run and reverse given 3 phase induction motor	12
5.	Measure starting and running current, voltage & speed of 3 phase induction motor	12
6.	Control the speed of 3 phase induction motor by various methods (by varying method by changing pole method)	12
7.	Dismantling the three phase motor	8
8.	Dismantling testing resembling and installation of three phase motor	12

9.	Noting data of burnt motor and remove the coils and clean the slot	12
10.	Insulate the slots, prepare new coils as per old could, in setting wedges in the slots, of rewound starter, tapping & binding & shaping of rewound starter coil	12
11.	Baking and varnishing of rewound starter	12
12.	Test the rewound motor, assemble the motor, test it and start and run	12
13.	Estimation, costing and billing of 3 phase induction motor rewind	8
14.	Find out start and end terminals by two voltmeter or two amp meter test the coil	8
15.	Study of control circuits accessories, preparation of simple circuits	12
16.	Dismantle the electric pump repairing and reassembling it	12
17.	Dismantle the submersible pump, repairing and reassemble it, study of float switch	12
18.	Study of relays, setting of relays	12
19.	Study of DOL starter and connect to three phase induction motor	12
20.	Study of fully automatic star delta starter and connect to 3 phase induction motor, replacement of faulty parts in starter	12
21.	Visit to rewinding shop and prepare detailed report	12
	Total	**240**

Reference Books

1. Electrical Technology - Edward Hughes
2. Electrical Technology - H. Cotton
3. Study of Electrical Appliances and devices - K.B.Bhatia
4. Elements of Electrical Gadgets - K.B.Bhatia
5. Small Appliances Servicing - P.T. Brook Woll Jr.
6. How to repair small Appliances - Jack Darr
7. Electrical Wiring Estimating & Costing - J. D. Gupta
8. Audels Home appliances servicing - Edwin P. Anderson
9. Electrical Motor Repair - I. M. Anwani
10. Electrical Wiring Estimating & Costing - S. L. Uppal
11. Electrical Motor Winding & Repair - Anwani
12. Basic Electrical Engineering - A Kastkin
13. Basic Electricity (Hindi) - K. B. Bhist
14. Maintenance of Domestic Appliances - R. B. Lal
15. Audels Electrical Motor Guide - Edwin P. Anderson
16. House Wiring Practice - T. D. Bhise
17. Indian Electricity Rules - Nausheer Bharocha
18. Fundamental's of Electricity - Kernard C. Graham
19. Electrical Engineering - B. L. Theraja P - I, II, III, IV
20. Basic electronics - By V. K. Me
21. Basic Electricals - By B. L. Jheraja

INFRASTRUCTURE

1. Classroom =400sf with charts, display board, black board, ohp, computer with internet facility
2. Workshop/lab =600sf with required appliances and wiring material, wiring boards at least two, charts, display board, black board, ohp, computer with internet facility
3. Electric power supply at least 5KW, 3 phase
4. Pure drinking water facility
5. Library may be common but separate store required

List of Equipment		
Sr. No.	**Description**	**Quantity**
1	Air conditioner functioning	1
2	Ammeter A.C. and D.C. analog	8
3	Ammeter multi range A.C. D.C.	8
4	Armature winding machine	1
5	Battery charger	2
6	Battery lead acid diff. types	2
7	Bi-metallic relay,	2
8	Blow lamp with 1ltr capacity	1
9	Wiring board	1
10	Centrifugal Pump	1
11	Ceiling fan winding machine	1
12	Centrifugal switch	1
13	clip on meter	2
14	Coil winding machine with counter clutch arrangement	1
15	Decorating night lamp for ceiling lamp	3
16	Digital energy meter single phase	1
17	Digital energy meter three phase	1
18	Digital panel mounted ammeter 0-20A	2
19	Digital panel mounted voltmeter 0- 500 V	2
20	Digital stop watch	1
21	Digital tachometer	1
22	Dimmer stat single phase	1
23	Dimmer stat 3 phase	1
24	Drawing oven with thermostat 230V single phase	1
25	Dummy new rewinded armature for universal motor	2
26	Dummy squirrel cage rotors of 1/3 phase	2
27	Dummy stators single phase/ three phase	2
28	Dummy transformer core/ stamping diff. sizes	2
29	Earth resistance testing set with spikes	1
30	Electric hand drill machine with bits	2
31	Electric microwave oven	1

32	Electric bell indicator	2
33	Electric blender/juicer	1
34	Electric blow fan	1
35	Electrical cabinet/cabin fan	1
36	Electrical ceiling fan	4
37	Electrical cutter/grinder	1
38	Electrical domestic floor mill	1
39	Electrical domestic vaccum cleaner	2
40	Electrical exhaust fan	2
41	Electrical food processor	1
42	Electrical hand drier	1
43	Electrical heat convector	2
44	Electrical induction cooker	2
45	Electrical invertors	1
46	Electrical iron ordinary, automatic, spray, laundry	4
47	Electrical room cooler	2
48	Electrical Soldering iron	4
49	electrical table fan	1
50	Electrical tea and coffee maker	1
51	electrical toaster	2
52	Electrical UV/RO Purifier	1
53	Electrical voltage stabilizer	1
54	Electrical washing machine Semi/ Automatic	2
55	Electrical water boiler	2
56	Electrical wind generator (model)	1
57	Electronic relay, electronic timer	2
58	Emergency torch/light	2
59	External growler	1
60	Fan regulator diff. types	4
61	Fluorescent tube with accessories	5
62	Frequency meter	1
63	Internal growler 250V	1
64	Mercury vapor lamp	1
65	Sodium vapor lamp	1
66	MCB's and ELCB's	2
67	Capacitor Motor	1
68	Capacitor start capacitor run motor	1
69	Sheded pole motor	1
70	Split phase motor	1
71	Squirrel cage induction motor 3 phase	1
72	Universal motor	2
73	Multi stage pump	1
74	Ohm-meter	1
75	Oil can	1
76	Phase sequence indicator	1

77	Starter auto transformer for 3 phases induction mot.	1
78	Starter automatic star/delta for squirrel cage induction 3 phase motor	1
79	Starter DOL for squirrel cage 3phase induction motor	1
80	Transformer C.T.	1
81	Transformer 230/6V 12V 2.5A	1
82	Power factor meter	1
83	Rectifier bridge, half wave, full wave	3
84	Refrigerator	1
	Total	**142**

List of Tools		
Sr. No.	**Description**	**Quantity**
1	Adjustable pipe wrench350mm	2
2	Adjustable stator holder for rewinding work	2
3	Adjustable wrench	2
4	Allen key set (Metric)	2
5	Auto wire insulation stripper	5
6	Bearing puller suitable for 5HP motors	1
7	Bench vice 150mm, 200mm	2
8	Chisel cold 12mm, 300mm,12mm 350 mm	8
9	Chisel firmer with handle	4
10	Crimping tools	1
11	De-soldering pump and wire	2
12	Dial gauge	1
13	Electrical knife with double blade	5
14	Electronic leak detector digital type	1
15	File set	1
16	Fire buckets 10 ltr	2
17	Fire extinguisher	1
18	Grease gun	2
19	Hack saw mini	5
20	Hammer ball pen	4
21	Hammer claw	2
22	Hammer straight pain	2
23	Hand drill machine with bit	1
24	Home protector	1
25	Hydrometer	1
26	Insulated side cutting pliers 10mm, 150mm	10
27	Mallet	2
28	Pincer	2

29	Pipe cutter	2
30	Pliers insulated combination flat nose, long nose	20
31	Spanner box set	1
32	Spanner set ring type	1
33	Spanner set box type	1
34	Spirit level	1
35	Standard wire gauge	2
36	Scissors	4
37	Screw driver set	5
38	Screw driver connector	5
39	Tube holder	4
40	Winding wire cutter	2
41	Wire pusher	1
42	Coil spreader	2
43	Electrical wrench diff. type	1
44	Tenon saw	2
45	Neon line tester	10
	Total	**138**

3 : AUTOMOBILE TECHNOLOGY (K1, K2, K3)

Scheme of Examination

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V. *	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Automotive Engine	80	3	80	3	20	10	10	200
2	Basic Engg. Drawing and Body Repair	80	3	80	3	20	10	10	200
3	Automotive Dealership	80	3	80	3	20	10	10	200

* IV = Industrial Visits

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V. *	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Power Transmission System	80	3	80	3	10	10	10	10	200
2	Automotive Electricals and Electronics	80	3	80	3	10	10	10	10	200
3	Vehicle Maintenance and Vehicle Rules	80	3	80	3	10	10	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Introduction

All India Council for Technical Education, (AICTE), the apex body for making and maintaining the norms of Technical Education in the country has framed a National Vocational Education Qualification Framework (NVEQF) for the polytechnics and Engineering Colleges.

NVEQF is introduced by Government in order to formally integrate vocational education together with its current conventional educational streams across school and higher education space and provide an opportunity and incentive to students to explore a large universe of opportunity.

It is important that a Vocational Educational Qualification Framework is in place that allow cross mobility of standards and their absorption in Industry with certain skill gained over a fixed period of time or their seamless integration into higher learning that enable them to acquire formal degree and higher skill so that they perform higher level jobs in industry.

Directorate of Vocational Education has gone for NVEQE based curriculum development. Each curriculum provides a list of Job opportunities (both waged and self) and description of each job.

Each curriculum provides a list of Job opportunities (both wage and self) and description of each job. The objective of the course, scheme of studies and examination pattern, syllabus are given.

The objectives of the course, scheme of studies and examination pattern, syllabus are given. The present competencies based curriculums on “Automobile Technology” was implemented through Maharashtra State Board of Secondary and Higher Secondary Education, Pune after upgrading them since 2007-08. The two curriculums were falling short to fulfill the needs of Indian as well as foreign industries.

To overcome this difficulty different group of expert worked to have a job and self employment generating opportunity by clubbing the two curriculums. The Group of Experts comprised of DVET officials, Experts from industries and Teachers and Instructors teaching to these two curriculums. I am sure that the proposed draft of curriculum will be immensely useful not only to the Maharashtra State Board of Secondary and Higher Secondary Education, Pune but also for the implementing agencies. Teachers, Instructors, Book Writers, examiners and research workers of accepted largely by the stake holders. The suggestions by the various experts in the field of vocational education and industries will be greatly valued and will go a long way in bringing out a revised version after reviewing by them.

Objectives

- To make students familiar with shop discipline, layout of automobile shop, safety practice.
- To acquire knowledge and skills about safety precautions while working
- To acquire knowledge about function and use of various automobile tools, equipments and accessories
- To acquire with properties and uses of different materials (Car washer, air compressor, Hydraulic hoist etc)
- To know about road signs and signals commonly used on roads.
- To develop knowledge about the servicing of an automobile
- To get introduced to automobile shop to classify different tools machines and equipments
- To acquire skills of Driving
- To develop knowledge about the denting and painting
- To do any type of repairing such as engine, transmission and other systems
- To know about planning layout, setting and up keeping of automobile workshop
- To get knowledge about estimation, costing and billing of repaired vehicles.
- To ACQUIRE the detail knowledge of Auto electrical and electronics, Sales, Warranty, Insurance of Vehicles, Motor Vehicle ruler etc
- To UNDERSTAND how to work on automobile servicing and maintenance of an automobile
- To CREATE an awareness about all advance automobile systems
- To develop TECHNICIAN SKILLS in the field of Dismantling, Servicing, Overhauling, Maintenance, testing and reassembling of vehicles.
- To ACQUIRE the skill in sales and marketing of latest vehicles, spare parts and raw materials.
- To GAIN the knowledge and skill of servicing and overhauling of 2/3/4 wheeler
- To BECOME a Technician of automobile with the details of servicing, repairing and maintenance of commercial vehicles
- To obtain the details skills of reconditioning, repairing of various type of batteries
- To GROW up as an FIRST GENERATION ENTREPRENEUR from non-business family
- To participate in the development of country not as an employee by as an EMPLOYER
- To RISE UP as a TECHNOCRAT with ability to take higher vocational education
- To make students familiar with painting shop discipline, layout of spare parts shop, safety practice.
- To acquire knowledge about function and use of special tests and equipments used in automobile workshop.
- To develop knowledge about the safety driving
- To acquire skills for warranty methods
- To develop knowledge about Denting, painting, auto electrical etc
- To develop knowledge about sale and value added services.

Job Opportunities

Wage Employment

- General & Mechanic
- Diesel fuel system service mechanic
- LPG system service mechanic
- Vehicle service technician
- CNG System service mechanic
- Auto filter in manufacturing concern in assembly shop or testing shop
- Inspector in auto manufacturing industries
- Dealer service mechanic
- Spare parts sales assistant / manufacturing representative.
- Vehicle surveyor and loss assessor
- Craft instructor (Auto)
- Driver cum mechanic
- Denter and Painter
- Insurance Surveyor
- Auto electrician
- Warranty processor
- Vehicle sales representative
- Technician in Wheel balancing and wheel alignment

Self Employment

- Dealership and agency at MNC-AUTO
- Owner of an Automobile Repair Shop
- Owner of pre-Owned Vehicles sales shop
- Owner denting and painting workshop shop
- Proprietor Service Center for auto electrical
- Proprietor service Center for automobile vehicles.
- Battery Service Technician
- Proprietor Spare Parts Shop
- Proprietor of Tourist Vehicles
- Proprietor of Commercial Vehicles
- Vehicle surveyor and loss assessor
- Taxi cab service provider
- Driving school owner

Std. XI
Paper I: Automotive Engine (K1)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Introduction of automobile vehicle	1.1 History of automobile	08
		1.2 Power transmission diagram	
		1.3 Classification of engine	
		1.4 List the vehicle manufacturing companies and their models	
		1.5 Automotive cycles – Otto cycle, Diesel cycle	
2.	Construction And working of I.C. engine	2.1 Construction and working of 2-stroke S.I. and C.I. engine	20
		2.2 Construction and working of 4-stroke S.I. and C.I. engine	
		2.3 Difference between S.I. and C.I. engine	
		2.4 Difference between 2-storke and 4-stroke engine	
		2.5 Classification of multi cylinder engine	
		2.6 Firing order of multi cylinder engine	
		2.7 Merits and demerits of single cylinder and multi cylinder engine	
3.	Automotive engine parts	Important parts used in 4-stroke engine – engine block, crank case, cylinder head, oil chamber, piston, types of piston, piston pin, connecting rod, crank shaft, cam shaft, flywheel, crank shaft pulley	12
4.	Valve and valve mechanism	4.1 Construction and working of valve mechanism	14
		4.2 Parts used in valve mechanism	
		4.3 Valve timing diagram	
		4.4 Study of OHC and OHV engine	
5.	Cooling System	5.1 Function, necessity of cooling system	14
		5.2 Types of cooling system, air and liquid cooling system, thermosyphon cooling, pump circulation cooling, evaporative system	
		5.3 Components of liquid cooling system – Radiator, radiator pressure cap, water pump, fan and fan belt, water jacket, thermostat valve, hoses, coolant	
6.	Lubrication System	6.1 Objectives of lubrication system	14
		6.2 Types of lubricants – solid, semisolid and liquid lubricants	

		6.3 Information of multi grade oil	
		6.4 Types of lubrication system – gravity feed, splash , pressure lubrication, dry sump lubrication	
		6.5 Parts of pressure lubrication system	
		6.6 Introduction to SAE for viscosity of oil	
7.	Petrol fuel supply	7.1 Purpose of fuel system	20
		7.2 Components of fuel supply system – a) Fuel tank b) Fuel cock c) Fuel filter d) Fuel pump and its types e) Carburetor and its circuit f) Air cleaner and its types	
		7.3 Supercharging, types of supercharger	
		7.4 M.P.F.I. system, sensors used in it	
		7.5 LPG and CNG fuel supply system	
		7.6 Turbocharger	
		7.7 Exhaust system – exhaust manifold, exhaust pipe, muffler and its types, tail pipe	
8.	Diesel fuel supply system	8.1 Layout of 4-cylinder diesel supply system	18
		8.2 Components of fuel system – a) Feed pump b) Diesel filter c) Fuel injection pump (FIP) and its types d) Injector e) High pressure pipe	
		8.3 Phasing and calibration of pump	
		8.4 Types of nozzle, types of injector testing	
		8.5 C.R.D.I. System	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	To study the Technical Specifications of latest two and four wheeler. Take a specimen example of any two and four wheeler.	08
2.	Demonstration on working model of two stroke Petrol Engine.	08
3.	Demonstration on working model of four stroke Petrol Engine.	08
4.	Demonstration on working model of four stroke Diesel Engine.	08
5.	Remove the Cylinder Head and Block-Piston Assembly from four stroke single cylinders Petrol Engine, Clean, Inspect, Repair and Refit.	12
6.	Remove the Cylinder Head of four stroke multicylinder Diesel Engine, Clean, Inspect, Repair and Refit.	12
7.	Draw & study the following circuit diagram of four stroke multicylinder petrol engine a. Battery Ignition System b. Water Cooling System c. Pressurised Lubrication System	12
8.	Remove radiator from four wheeler, Clean, Check for leakage and repair if found defective.	12

9.	Remove Water Pump from four wheeler, Replace if found defective.	12
10.	Remove Lubricating Oil Pump from Engine. Dismantle, Clean, Inspect, Repair, Reassemble and Refit on Engine.	12
11.	To perform oil change of four wheeler - to check and replace Engine Oil, Oil Filter, Diesel Filter and Clean Air Cleaner.	12
12.	Dismount mechanical fuel pump from petrol engine. Dismantle, clean, inspect, report on condition. Suggest remedial measures, repair, reassemble and refit.	12
13.	Tune up a carburetor used on four stroke motorcycle.	12
14.	Tune up a carburetor used on four stroke multicylinder petrol car.	12
15.	Study MPFI system used on latest car.	14
16.	Study of working of CNG and LPG fuel system on vehicles and its components.	12
17.	Dismount fuel feed pump from FIP of diesel engine. Dismantle, clean, inspect, report on condition. Suggest remedial measures, repair, reassemble and refit.	16
18.	Dismount fuel injection pump from diesel engine. Dismantle, clean, inspect, report on condition. Suggest remedial measures, repair, reassemble and refit.	16
19.	Dismount injector assembly from diesel engine. Dismantle, clean, inspect, report on condition. Suggest remedial measures, repair, reassemble and refit.	14
20.	Visit to two wheeler service station.	08
21.	Visit to F.I. pump service station and study the process of phasing and calibration of FI Pump.	08
	Total	**240**

Paper II: Basic Engg. Drawing and Body Repair (K2)
Theory

Section A – Basic Engg. Drawing

Sr. No.	Unit	Sub-Unit	Periods
1.	Introduction	1.1 Introduction, layout of drawing sheet	07
		1.2 Drawing instruments and their correct method of use	
		1.3 Lines – types of line and their use	
		1.4 Lettering – writing single stroke, capital and lower capital letters	
		1.5 Dimensioning	
2.	Orthographic Projection	2.1 Pictorial view and orthographic projection, first and third angle method, concept of plan, elevation and side view	18
		2.2 Preparation of orthographic from isometric	

		view	
		2.3 Projection of point, line, planes and solid by first angle method	
3.	Free hand sketches of automobile parts	3.1 Free hand sketches of Orthographic view of automobile parts and their assemblies like piston, connecting rod, crank shaft, camshaft, valve, rocker arm, universal joint, spark plug, injector, master cylinder, wheel cylinder, air cleaner	08
4.	Isometric Drawing	4.1 Isometric scale and true scale	18
		4.2 Isometric drawing and isometric projection procedure for drawing	
		4.3 Drawing different types of symbol used in drawing	
5.	Screw Threads	5.1 Nomenclature of screw thread, definition and meanings of various element of threads pitch depth of thread, lead, right and left hand thread, major and minor diameter etc	07
		5.2 Various thread section like B.S.W. Buttress, ACME, metric knuckle, square, plane washer, star washer etc	
6.	Fasteners	6.1 Study of nut bolt like hexagonal, square and round headed bolts, studs, nuts, set screws and foundation bolt	07
		6.2 Locking devices like lock nut, split pin, castle nut, keys and engine foundation bolts, rivets, riveted joint	
7.	Introduction to Computer Aided Drafting	7.1 Create, open, save print and drawing file in CAD software	10
		7.2 Drawing various entities like line, circle, ellipse, arc etc in drawing file	
		7.3 Edit existing drawing file	

Section B – Body Repair Works

Sr. No.	Unit	Sub-Unit	Periods
1.	Body frame component	1.1 Introduction of body , types of body , body panels , frame , types of frame , frame alignment	09
		1.2 Introduction and constructional feature of body components i.e. Wings, doors, bonnet, boot lead, tail gate, bumper bars, covers and other component	
2.	Denting and Surface Finishing	2.1 Procedure for cut open bit out dents, miracle denting	10
		2.2 Stripping of old paint	

		2.3 Sanding of different stages	
		2.4 Fitment of repair part and alignment to original shape	
		2.5 Fitting the windshield screen glass	
3.	Painting	3.1 General idea of ISI specification on paint and varnish	16
		3.2 Procedure for doing painting in chronological order	
		3.3 Selection of material, tools and equipments	
		3.4 Application of body filler for surface preparation	
		3.5 Various cleaning agent/sprays – dewaxing, detergent, degreaser, special purpose agent	
		3.6 Sanding on smooth surface prepared, various spray painting gun, method and application	
		3.7 Applying base coat painting, clear coat painting for metallic paint	
		3.8 Introduction, type and method of oven baking procedure i.e. powder coating, plastic coating, electroplating, buffing process etc	
		3.9 Different type of baking oven	
		3.10 Types of paint, lacquer coat, rubbing and polishing	
		3.11 Procedure for inspection of painting work, introduction of robotic painting	
4.	Refit and replace component and estimating and costing	4.1 Introduction of estimating labour charges, material charges	10
		4.2 Costing procedure for body repair and painting	
		4.3 Procedure to remove and replace and refitting of body component	
		4.4 Introduction of new innovation in body and chassis design	
		4.5 Different classes in car hatchback, sedan, SUV, Different classes in buses/truck	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
SECTION - I		
1.	Draw drawing sheet layout and drawing instruments and use of it.	08
2.	Drawing of Lines, lettering, Numbering, Dimensioning	12
3.	Drawing of Geometrical construction like Ellipse, Cycloid etc.	16

4.	Drawing projection of line, point and plane.	12
5.	Orthographic projection of lines and pictorial views	16
6.	Sectional views of screw threads.	08
7.	Free hand sketch of Nut, Bolt and Washers.	08
8.	Free hand sketch of Screw, Stud and Set screw.	08
9.	Free hand sketch of various types of keys.	08
10.	Drawing of Isometric views by third angle method.	16
11.	Edit the drawing by computer aided drafting (AUTOCAD)	12
SECTION - II		
1.	Demonstration and free hand sketch of various types of frame and Body Components.	08
2.	Demonstration and use of special tools used in denting and study of miracle denting tools.	08
3.	Different types of sheets e.g. tin, galvanized, iron, copper, brass, aluminum. Bending, denting and riveting of sheets.	08
4.	Demonstration of gas welding equipments.	12
5.	Demonstration of arc welding and prepare a job.	12
6.	Prepare denting procedure on any single body part.	12
7.	Prepare painting procedure on any single body part.	16
8.	Estimating & Costing of Body & Paint Repair- Labour, Material, Paint Charges, Body components. (Note- Refer labour charges schedule of dealer.)	08
9.	Inspection of tyres regarding tyre size, types of trade, types of tyres, inspection of rim, balancing of wheel, tyre wear diagnosis.	08
10.	To study the process of powder coating, plastic coating, electroplating, buffing etc.	08
11.	Visit to modern body shop and prepare visit report in journal.	08
12.	Visit to modern spray paint booth and prepare visit report in journal.	08
	Total	**240**

Paper III: Automotive Dealership (K3)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Introduction of Automotive dealer	1.1 Standard operational procedure of automotive dealer	10
		1.2 Various department in dealership i.e. sales, spare, service	
		1.3 Introduction to Role of Works manager, service advisor, service engineer, sales executive, spare part manager, technician	

2.	Retail and institutional sale of new vehicles and sale of pre-owned vehicle	2.1 Operating procedure of the organization/dealership for sale enquiries	18
		2.2 Promotions, discount offers, available from dealership and the OEM	
		2.3 Prices, taxes and other applicable cost element for the vehicle	
		2.4 Documentation required for each procedure carried out	
		2.5 The individuals on the job needs to know and understand – how to greet and meet customer walking in to showroom, telephonic enquiries, queries about cost and service and technical aspect of vehicle, how to respond for negative comments, how to arrive at final on road cost of vehicle, documentation required, facilities about insurance and finance offered by dealership	
		2.6 Standard operation procedure of the OEM for valuation of pre-owned vehicle	
		2.7 Calculation of exact pricing for purchase of pre-owned vehicle	
3.	Vehicle accessories and Value Added Services	3.1 Information of sale accessories – Exterior accessories i.e. alloy wheels, bull bar driving light, mud guard, nudge bar, park assist, rear spoiler, roof track, roof rack and attachment, side step, tonneau cover, towing kit, tray bodies, tray liner, tyre pressure monitoring system, vehicle protector, visors, carbon fiber bonnet louvers, carbon fiber boot lid finisher, carbon fiber mirror cover, black and chrome grill set, aerodynamic pack, decal, wheel cap, wind spoiler/deflector, luggage carrier	18
		3.2 Vehicle protection accessories	
		3.3 Interior accessories, entertainment and media accessories	
		3.4 How to calculate the cost of repairs based on accessories installed and labour charges	
		3.5 Value added services	
4.	Spare part operation	4.1 Technical specification of spare part,	18

		study of stock record	
		4.2 The procedure required to use mechanical handing equipments	
		4.3 Maintain record of parts identification and easy retrieval	
		4.4 Spare part terminology and codes	
		4.5 The tools and technology used for packing and storing the parts	
		4.6 Function of material handling equipments	
		4.7 Inventory, inventory control	
		4.8 Responsibilities of store keeper, store keeping	
		4.9 Types of stores	
5.	Monitor and maintain Warranty Claim	5.1 The warranty policy and procedure applicable	14
		5.2 Types of warranties	
		5.3 Terms and condition of warranty, and its tenure	
		5.4 How to interact with customer to make them aware about the benefits of warranty	
		5.5 Warranty claim procedure in proper order	
		5.6 Parameter to be check before settlement of claim	
		5.7 Maintaining record of warranty spare part	
		5.8 Inventory of failed parts	
6.	Introduction of workshop	6.1 Workshop Environment	10
		6.2 Workshop Discipline	
		6.3 Workshop Ethics	
		6.4 Workshop Layout	
		6.5 Safety Precaution	
		6.6 First Aid	
7.	Tools and Equipments Used in dealer workshop or garage	7.1 Description of various tools and equipment used in automobile garage i.e. Hammer, pliers, chisels, files, spanners, hacksaw, scriber, Allen key sockets, pipe wrench	14
		7.2 Description of various machines and equipments used in automobile garage i.e. air compressor, car washer, mechanical and hydraulic jack, pneumatic grease gun, oil spray gun, mechanical press, hydraulic	

		press, hand and pedestal grinder, pillar drill machine	
8.	Special tools and equipments in dealer workshop or garage	8.1 Description of measuring tools – vernier caliper, micrometer, dial indicator, tachometer, feeler gauge, compression gauge, vacuum gauge, cylinder bore gauge, Ohm meter, battery cell tester, hydrometer, depth gauge, thermometer	18
		8.2 Description of equipments – spark plug tester, timing light gun, boring machine, honning machine, wheel alignment gauge, air drill, air hammer, piston ring expander, piston ring compressor, connecting rod aligner, exhaust gas analyzer, injector tester, V belt tension gauge, valve spring compressor, bearing puller	
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Study standard layout of two wheeler and four wheeler Automotive Dealer.	12
2.	To study the job card, Preparation of job card on demo.	12
3.	To study the duties of Works Manager, Service Engineer, Service Adviser, Sales Executive, Spare parts store Manager in Automotive Dealer.	16
4.	To study the valuation process of pre-owned cars.	12
5.	Demonstration and fitting of sale accessories.	12
6.	Demonstration and fitting of protection accessories.	12
7.	Demonstration and fitting of entertainment and media accessories.	12
8.	To study the information related to Warranty Claim Procedures.	12
9.	To study the spare parts terminology and codes.	16
10.	To study the safety rules in workshop and first aid facilities.	12
11.	Demonstration, Sketch and use of various Hand tools i.e. Hammer, Chisels, Pliers, File etc.	20
12.	Demonstration and use of various Spanners used in Automobile Workshop.	20
13.	Demonstration sketch and use of measuring tools like vernier caliper, micrometer, multimeter outside and inside caliper etc.	20
14.	Demonstration and use of special tools like spark plug spanner, Torque wrench and oil filter wrench, valve spring compressor, Piston ring expander and compressor.	20

15.	Study of various machines used at dealer's workshop like Wheel Alignment Machine, Hoist, Car Washer, Compressor, Pneumatic tools etc.	16
16.	Visit to Automotive dealer of two wheeler.	O8
17.	Visit to Automotive dealer of four wheeler.	08
	Total	**240**

Std. XII
Paper I: Power Transmission Systems (K1)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Clutch	1.1 Objectives/purpose to clutch 1.2 Classification of clutch 1.3 Parts of clutch and their function 1.4 General characterstics of ideal clutch 1.5 Detail study of types of clutch friction-cone clutch, single plate, multi plate, diapram clutch, hydraulic clutch, automatic-semi centrifugal, centrifugal, torque convertor, fluid flywheels. 1.6 Clutch adjustments 1.7 How to operate clutch, Double operating or D-clutching	16
2.	Gear box	2.1 Introduction to gear box and its purpose 2.2 Resistance to speed of vehicle 2.3 Type of gear 2.4 Principle of gear box, 2.5 Construction of gear box 2.6 Types of gear box-sliding mesh, constant mesh, synchromesh, planetary or epicyclical gear box 2.7 Over drive 2.8 Gear box sensors 2.9 Variator 2.10Automatic transmission a)semi b) fully 2.11Introduction to power take off	18
3.	Drive lines	3.1 Functions of propeller shaft 3.2 Types of drive-Front wheel drive, rear wheel drive a)Hotch kiss drive b) Torque tube drive, four wheel drive 3.3 Necessity of universal joint and slip joint 3.4 Types of universal joint a) cross and yoke type b)constant velocity type c) pot type d) fabric and rubber type	10
4.	Rear Axle and	4.1 Introduction to real axle	12

	Differential	4.2 Function to real axle 4.3 Types of rear axle a) live axle b) dead axle 4.4 Types of live axle a) rigid axle b) flexible axle 4.5 Rear axle casing a) banjo type b) split type 4.6 Types of rear axle a) semi floating b) three quarter floating c) full floating axle 4.7 Function of differential 4.8 Principle of differential 4.9 Standard/Simple differential 4.10 Types of differential a) Standard differential b) non slip differential c) double reduction type 4.11 Backlash adjustments with special equipments	
5.	Steering system	5.1 Introduction to steering 5.2 Objectives of steering system 5.3 Steering linkages, components of steering linkage 5.4 Introduction to steering gear box, types of steering gear box a) worm and sector b) worm and roller c) worm and nut d) worm and re-circulating ball bearing nut type e)worm and worm gear type f) cam and peg type g) rack and pinion type h) power steering i) electronic power steering (EPS) 5.5 Difference between HPS and EPS 5.6 Introduction to Steering geometry 5.7 Content of steering geometry a) Ackerman's principle b) toe in and toe out c) camber angle d) caster angle e) KPI f) included angle	16
6.	Suspension System	6.1 Introduction to suspension system 6.2 Function to suspension system 6.3 Types of Suspension springs a) Leaf spring b) Coil spring c) Torsion bar 6.4 Types of leaf spring a) Semi elliptical leaf spring b)Quarter elliptical leaf spring c) Three quarter elliptical leaf spring d) Transverse e) Cantilever 6.5 Independent suspension system types a) Parallel link method or wishbone independent suspension b) Vertical slide c) Swinging arm d) Divided axle e) Mach Pherson strut suspension 6.6 Construction & working of Air suspension system 6.7 Shock Absorber Types a) Mechanical b) Hydraulic shock absorber 6.8 Introduction a) piston type shock absorber 1) single acting 2) double acting 6.9 Introduction of shock absorber testing	12

7.	Brake	7.1 Introduction to brake 7.2 Function of brake 7.3 Characteristic of brake 7.4 Classification of brake a) external contacting b) internal contacting brake 7.5 Types construction and working of internal expanding brakes a)mechanical brake b)hydraulic brake c) vaccum servo brake d) air pressure brake e) disc brake 7.6 Introduction of hand brake 7.7 Principles of hydraulic brake system, construction and working of hydraulic brake, merits an demerits of it 7.8 Components of hydraulic brake system a)master cylinder-tandem master cylinder b) wheel cylinder 7.9 Brake bleeding 7.10 Characteristic of brake oil 7.11 Brake lining material 7.12 Combination valve in hydraulic brake system (front and rear disc brake) 7.13 Introduction to Anti-skidding-brake system (ABS), necessity and working principles of ABS, various parts in ABS, types of ABS, advance ABS with EBD (embedded) introduction 7.14 Introduction to Sensors used in ABS	18
8.	Wheels Tyres	8.1 Purpose of tyre 8.2 Types of tyre-solid, pneumatic and tubeless 8.3 Tyre inspection, tyre removal, rotation of tyre, defects in tyre due to over and under inflection 8.4 Types of wheels, split type, disc, pressed steel wire and spooked wheels 8.5 Repairs of tyres and tubes such as valcanising and tyre retarding	12
9.	Diagnosis of vehicle repair	9.1 Standard operation procedure for repair and servicing of vehicle 9.2 Use of skill i.e. test drive, core skills, generic skills, writing skills	06
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Dismantle multiplate clutch of any motorcycle, clean, inspect, report on condition and suggest remedial measures, repair & refit.	08

2.	Dismount single plate clutch of car/jeep, dismantle, clean, inspect, report on condition, suggest remedial measures, repair & refit.	16
3.	Dismantle Gear Box of any four stroke motorcycle, clean, inspect, report on condition and suggest remedial measures, repair & refit.	16
4.	Dismount Synchromesh Gear Box of any car/jeep, dismantle, clean, inspect, report on condition and suggest remedial measures, repair & refit.	12
5.	Dismount propeller shaft from rear wheel drive vehicle, dismantle both Universal Joints, clean, inspect the parts & replace U Joint repair kit and refit propeller shaft on the vehicle.	12
6.	Dismount Differential Unit of any car/jeep, dismantle, clean, inspect, report on condition and suggest remedial measures, repair & refit.	12
7.	Dismount Steering Gear box from four wheeler, Dismantle, Clean, Inspect and Report on conditions, Suggest remedial measures, repair and refit.	12
8.	Demonstration and Study the Power Steering System used on car.	12
9.	Overhaul the Handle Bar Assembly of motorcycle.	12
10.	Perform the wheel hub greasing of car/jeep.	12
11.	Overhaul the front fork assembly of motorcycle.	12
12.	Dismantle front axle with independent suspension, inspect, report on condition of parts, repair and refit it properly.	12
13.	Dismantle front axle with rigid suspension, inspect, report on condition of parts, repair and refit it properly.	12
14.	Overhaul Master & Wheel cylinder of car/jeep.	16
15.	Overhaul the drum brake system and adjust brake shoe clearance and pedal free play.	12
16.	Overhaul the disc brake system.	12
17.	To top up Brake fluid and carry out Brake Bleeding process.	08
18.	Perform the process of tube valcanisation by using hot patch machine.	08
19.	To study the procedure of identify the problems in engine by using various types of skills.	08
20.	Visit to Tyre Retreading Centre.	08
21.	Visit to Computerised Wheel Balancing & Alignment unit.	08
	Total	**240**

Paper II: Automotive Electrical and Electronics (K2) Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Basic Principle of Electricals and Electronics	1.1 Simple electrical circuit and parallel circuit	12
		1.2 Identification of AC and DC, magnetism, electromagnetism and electromagnetic induction	

		1.3 Insulators, conductors, types of resistance	
		1.4 Common electrical terms and symbols	
		1.5 Vehicle earthing and earthing methods	
		1.6 Purpose of resistor, capacitor and inductor,diode	
		1.7 Different types of diodes, transistors, power supply for electronics ckt, fuses and their types and rating	
2.	Use of tools and equipments	2.1 Introduction, principles and uses of following tools and equipments – Hydrometer, high rate discharge tester, multi meter, continuity meter, alternator regulator tester, spring tension tester, spark plug tester, CRDI scanner and battery analyzer	12
		2.2 A.C. refrigerant filling machine, growler machine, battery charger, ammeter, voltmeter	
		2.3 Executive auto electrical tool kit	
		2.4 Laptop	
3.	Ignition System	3.1 Necessity of ignition system, requirements of ignition system	16
		3.2 Types of ignition system – Magneto ignition, battery ignition, electronic ignition system	
		3.3 Parts of ignition system – ignition coil, condenser, distributor, C.B. point, spark plug and H.T. cable	
4.	Battery	4.1 Introduction of battery	18
		4.2 Types of battery	
		4.3 Lead acid battery, dry cell battery (maintenance free)	
		4.4 Chemical reaction in battery	
		4.5 Battery charging and types – constant voltage charging, constant current charging, high rate charger trickle charging	
		4.6 Battery testing – sp gravity, open volt, high rate discharge test, cadmiums test	
		4.7 Effect of battery mishandling on environment and common trouble in battery with remedies	
5.	Starter Motor	5.1 Introduction of Starter Motor	18
		5.2 Working principle of starter motor	
		5.3 Construction and working of starter motor	
		5.4 Drive arrangements and types of drive – bendix and follo thro drive	
		5.5 Starter motor switches, solenoid switch	
6.	DC and AC Generator	6.1 Introduction of DC generator	18
		6.2 Construction and working of DC generator and its part	
		6.3 Generator controllers, cutout relay and regulators	
		6.4 Introduction of alternator	

		6.5 Principle of alternator	
		6.6 Construction and working of alternator and its parts	
		6.7 Voltage regulator, regulator unit, warning lamp, rectifier	
7.	Light Circuit	7.1 Different components in light circuit	12
		7.2 Refocused bulbs and seal beam	
		7.3 Fuses used	
		7.4 Sensors used in light circuit, flashers circuit	
		7.5 Electrical horn circuit, electric horn, horn relay	
		7.6 Electrical wiper motor	
		7.7 Speedometer/Odometer	
		7.8 Different gauges used in automobile and their functions	
		7.9 Introduction to ECU/ECM	
8.	Latest Innovation and Development in Modern Car	8.1 Auto air conditioning system	14
		8.2 Air bags	
		8.3 Power window	
		8.4 Central locking system	
		8.5 Introduction and working of navigation system, intelligent transport system	
		8.6 Introduction of theft deterrent system – Remote key less entry, Immobilizer system, passive entry system, finger print technologies and satellite system	
		8.7 Convenience and entertainment system – Audio visuals, analogue tapes, radio etc	
		8.8 Electrical and hybrid vehicle system	
Total			**120**

Practicals

Sr. No.	List of Practicals	Periods
1.	Free hand sketch of electrical symbols, different wire joints, soldering of wires, clips & lugs.	16
2.	By using multimeter check current, voltage & resistance of different types of coils, diodes, rectifier, field winding, armature, CDI etc.	16
3.	To dismantle Magneto ignition system of single cylinder engine, inspect and diagnosis the parts.	16
4.	To dismantle Battery ignition system and Electronic ignition system of multi cylinder engine, inspect and diagnosis the parts.	20
5.	Demonstrate the Internal construction of Battery by using a cut model.	12
6.	Check battery charging condition by using Hydrometer & Digital Multimeter.	12
7.	Dismantle the D.C. generator, inspect the all parts and check the	16

	armature on growler machine. Report on condition; suggest remedial measures, repair & refit.	
8.	Dismantle the alternator, inspect the all parts, report on condition and suggest remedial measures, repair & refit.	16
9.	Dismantle the startor motor, inspect the all parts and check the armature on growler machine. Report on condition; suggest remedial measures, repair & refit.	20
10.	Draw wiring diagram of Head light, Brake light, Tail light & Indicator light. Check all bulbs and fuses.	16
11.	Clean & adjust C.B point, Spark plug gap by using feeler gauge & check ignition timing by neon timing torch.	16
12.	To study the Air Conditioning system of a car.	16
13.	Overhaul Electrical Fuel Pump used on MPFI car.	16
14.	To study four wheeler electrical circuit diagram.	16
15.	Visit to Auto Electrical Service station.	08
16.	Visit to Modern four wheeler Service Station.	08
	Total	**240**

Paper III: Vehicle Maintenance and Vehicle Rules (K3)
Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Engine	Faults 1.1 Engine does not turns over 1.2 Engine does not start 1.3 Engine runs but misfires 1.4 Engine lacks power 1.5 Engine overheats 1.6 Noisy engine 1.7 Engine stalls and backfire	8
2.	Fuel System	Faults 2.1 Excessive fuel consumption 2.2 Smokey exhaust 2.3 Poor acceleration and lack of power 2.4 Stalling of engine	5
3.	Lubrication System	Faults 3.1 Excessive oil consumption 3.2 Low oil pressure 3.3 Excessive oil pressure	4
4.	Cooling System	Faults 4.1 Engine overheat 4.2 Engine warm up slowly 4.3 Cooling system leaks	4

5.	Electrical System	Faults 5.1 Engine does not cranking 5.2 Battery does not charge 5.3 Generator does not produce current 5.4 Defects in coil 5.5 C.B. point burn 5.6 Defective spark in plug 5.7 High tension coil leakage	7
6.	Clutch	Faults 6.1 Clutch slips while engaging 6.2 Clutch grab or chatter 6.3 Clutch spins or drags 6.4 Noisy clutch 6.5 Clutch pedal pulsation 6.6 Cluth lining wear fast	7
7.	Gear Box	Faults 7.1 Noise in transmission 7.2 Hard gear shifting 7.3 Gear slips 7.4 Chattering or grabbing of gear 7.5 No power transmission 7.6 Oil leakage from gear box	6
8.	Differential	Faults 8.1 Continuous noise in differential 8.2 Knocking in differential 8.3 Growling while taking turn 8.4 Power is not transmitting	4
9.	Suspension System	Faults 9.1 Spring noise 9.2 Hard and rough ride 9.3 Vehicle sway 9.4 Sagging of spring 9.5 Steering difficulties 9.6 Distortion in frame and body	7
10.	Steering System	Faults 10.1 Hard steering 10.2 Car wandering 10.3 Car pulling to one side 10.4 Front wheel shimmy 10.5 Wheel tramp 10.6 Excessive play in steering system	8
11.	Brake	Faults 11.1 Hard brake 11.2 Brake pedal goes to floor 11.3 Spongy brake 11.4 Noisy brake 11.5 Brake grab	8

		11.6 Uneven braking to wheels 11.7 Wheel skids when brakes applied 11.8 Brake pedal pulsation	
12.	Wheels	Faults 12.1 Tyre wears 12.2 Tyre cracks 12.3 Improper tyre contact to floor	4
13.	Air Conditioning System	Faults 13.1 A.C System not working 13.2 Low cooling 13.3 A.C. gas leakage	3
14.	Categories of vehicle	14.1 Various automotive vehicle – definition of light motor vehicle, medium motor vehicle, heavy motor vehicle, stage carriage, contract carriage, invalid carriage, private carriage, public carriage	9
		14.2 Importance of traffic sign, types of traffic sign	
		14.3 Signaling by driver	
15.	Motor Vehicle Rules	15.1 Rules related to – number plate of vehicle, location of light, minimum space required for passenger, gangway, floor to ceiling, front rear overhang	9
		15.2 Safety aspects in term of condition of tyre, brake, steering system	
		15.3 Importance and eligibility of Driving license, procedure to issue driving license	
		15.4 Registration, permit, fitness certificate	
		15.5 Rules related to driving habbits, offences and penalties regarding driving of vehicle	
		15.6 Rules related to safety precaution such as air bag, seat belt, collapsible steering	
16.	Road Transport	16.1 Introduction of transportation, role of transportation in industrial growth	6
		16.2 Modes of transport	
		16.3 Rules regarding transport vehicle carrying hazardous gases, chemicals, flammable gases	
17.	Environment Pollution	17.1 Pollution control norms (EURO norms), necessity of Euro Norm, Bharat stages	7
		17.2 Unleaded petrol, speed petrol, CNG, introduction of new vehicle operated on battery	
		17.3 Fuel saving tips	
		17.4 Role of every person and automobile	

		industry to control pollution	
18.	Automotive Insurance	18.1 Insurance, importance of insurance	8
		18.2 Types of vehicle insurance – first party insurance, third party insurance	
		18.3 Details of application form, various information required for vehicle being insured, documents required, insurance premium, and benefits for customer	
		18.4 Procedure of insurance claim, documents required for insurance claim	
		18.5 Calculations of insurance premium and insurance claim benefits	
		18.6 Zero depreciation policy	
19	Driving Skills	19.1 Explain main controls and their operation and function a) foot control b) acceleration c) clutch d) foot brake/hand brake e) steering wheel f) gear shifting g) wind screen wiper h) indicators i) heater j) door and lock 19.2 Explain precaution on entering vehicle, starting vehicle, turning vehicle to left or right, parking, driving on straight road, cornering on slip road, driving on ghat area. 19.3 Explain routine safety checks performed on vehicle. 19.4 Role of driver in case of accidents on road.	6
Total			**120**

Practical

Sr. No.	List of Practicals	Periods
1.	Study of Motor Vehicle Act-1988.	12
2.	Study of different forms used in RTO Office.	12
3.	Sketch different road signs & signals as per Motor Vehicle Act.	12
4.	Study of different types of safety features used in car.	12
5.	To sketch hand signals to be made by driver while driving.	08
6.	Check vehicle exhaust by Exhaust Gas Analyser (PUC)	12
7.	Carry out major tune up of car/jeep.	12
8.	Conduct compression & vacuum test on multicylinder petrol engine & draw your conclusions.	12
9.	Check cylinder bore and cylinder head. To study engine reconditioning process of same parts.	12
10.	To check connecting rod, crankshaft and cam shaft. To study	16

	reconditioning process of same parts.	
11.	Perform Ram Servicing of four wheeler and lubricate the points.	12
12.	Check Toe-in and Toe out by wheel alignment gauge.	12
13.	Check & correct tyre inflation of four and two wheeler including spare wheel.	12
14.	Overhaul multicylinder petrol engine.	20
15.	Overhaul multicylinder diesel engine.	20
16.	Study the Insurance Procedure of accidents affected vehicle.	12
17.	Perform Road test of four wheeler & introduction to driving skills.	16
18.	Visit to PUC center.	08
19.	Visit to RTO office.	08
	Total	**240**

Reference Book

1. Each manufacturer brings out booklets titled as Owner's manual brochures on maintenance etc.
2. Manufacturers, printed workshop manuals, wall charts etc. approach can be made to acquire progressively.
3. A] Tata-McGraw Hill, New Delhi
   B] Taraporewala and Sons, Bombay – Automobile Engineering
4. M/s Khanna Publishers, New Delhi – Automobile Engineering
5. The Motor cycle – L. Herman, ASIA publishing House
6. Moped Repair Hand book – Paul Dempsey, TAS BKS Blue Ridge Summit P. A.
7. Motor cycle overhauls – W.C. Hay, Craft Pitmans
8. Motor cycle mechanics – George Leer and L.S. Moshev Prentice Hall, New Jersey
9. Introduction to Auto Mechanics Gibbs and Meyer Pub – Canfield Press, Santrancisco
10. Automotive mechanics – S. Srinivasan, Pub. Tata McGraw Hill
11. Auto Engg. R.B. Gupta, Surya Prakashan, 16/7698, New Market, New Rohtak Road, New Delhi-5
12. Automotive Engineers – H.E. Ellinger, D.B. Taraporewala and Sons, Bombay
13. Car Repairs and maintenance – A.W. Judge, Pitman Publishing House
14. Automobiles Electrical Maintenance – A.W. Judge, Pitman Publishing House
15. Auto Brakes and Brake Testing – M. Platt
16. Work book for Automotive Service Trouble shooting William H. House
17. Motor in safety – Learn safe Driving – A Gannet Publication
18. Auto Steering Braking Suspension, Stain Abbey
19. Automotive Machines – William and Crows
20. Automobile Engineering – G.B.S. Narang
21. Automobile Engineering – Jospeth Hitler
22. Automobile Engineering – Mathur
23. Automobile Engineering – Kripal Singh

24. Automobile Engineering – Khanna
25. Principles of Electronics – V.K. Mehta
26. Basic Electronics (Ref. book) – B.L. Thereja
27. Spare Parts Catalogue of Two Wheeler
28. Spare Parts Catalogue of Four Wheeler
29. Paint Technology.

३०. मोटारीची निगा व दुरुस्ती - श्री. श्री. आपटे, उधम प्रकाशन नागपूर
३१. टू-व्हिलर मेकॅनिक - श्री पाटील
३२. मोटार मेकॅनिक - दंड गव्हाळ
३३. ऑटो व डिझेल सायकल - श्री श. पंडीत
३४. ऑटो ट्रान्समिशन - श्री पंडीत
३५. गॅरेज मॅनेजमेंट अँड व्हेईकल - श्री पंडित

AUTOMOBILE TECHNOLOGY

LIST OF TOOLS

Sr. No.	Name	Qty
1	Double open ended spanner (Merit size) 6 to 32 mm	02 Set
2	Double ended spanner(RSF size) 9 to 25 mm	01 Set
3	Double ended ring spanner 6 to 32 mm	02 Set
4	Adjustable spanner 20 cm	02 Nos
5	Spark plug spanner 14mm	2
6	Spanner socket of 8 to 32	1
7	Spanner T flex for screwing up and unscrewing in inaccessible position	1
8	Allen key set metric	1
9	Allen key set inch size	1
10	Circlip piler	1
11	Combination piler	1
12	Pipe wrench	1
13	Nose piler (Straight and Round)	1
14	Screw driver of 6 different sizes	2 Set
15	Torque wrench 0 to 67.5 kg.m.	1

16	Valve spring lifter	1
17	Valve seat cutting tools complete with guides and pilot bar(all angles)	1
18	Stud extractor	1
19	Compression gauge	1
20	Vacuum gauge	1
21	Piston ring expander and remover	1
22	Cylinder bore gauge capacity 6.25 to 15 cm	1
23	Pressure grease gun	1
24	Feeler gauge center type	1
25	Bearing puller(different sizes)	1
26	Mechanical jack	2
27	Hydraulic jack	2
28	Special punch for fitting bearing	2
29	Special punch for fitting oil seals	2
30	Oil can plugger type	2
31	Valve Die	1
32	Unserviceable bearing roller	4
33	Timing light	2
34	Mileage checking gauge	1
35	Electronic unit and H.T. Coil checking machine	1
36	Blow stove (for soldering)	1
37	Wheel spanner cross type	2
38	Pneumatic gun	1
39	Spring balance - 50 kg	1
40	Hammer Ball pein 0.75 kg	5
41	Hammer cross pein 0.7 kg	5
42	Hammer Ball pein 2.00 kg	2
43	Chisel cold flat 19 mm	5
44	Chisel cold cross out 9x3 mm	4
45	Chisel half round 9 mm	5
46	Hammer plastic 50 gm.	2

47	Hammer copper 1 kg.	1
48	Hacksaw frame adjustable for 20.30 cm blades	4
49	Center punch	4
50	Steel rule 15 cm English and Metric	5
51	Steel rule 100 cm English and Metric	2
52	Hand Brace1/4”	1
53	Brench vice 5”	4
54	Vice jaw clamp	1
55	File flat 18”rough, 2nd cut smooth	5
56	File half round 10”rough 2nd cut	5
57	File triangular 10” 2nd cut smooth	5
58	File round 10” 2nd cut smooth	5
59	Scrapper flat	1
60	Scrapper half round	1
61	File brush	2
62	Tool box	5
63	G.I. Tray (different sizes)	5
64	Oil can	4
65	Wall charts for various parts, system of the engine	1 Each
66	Pipe vice (small)	1
67	Anvil	1
68	Number punch	1
69	Sledge hammer	1
70	Scriber	2
71	Letter punch	2
72	Oil filter wrench	1
73	Magnet holder	1
74	clutch nut socket wrench	1
75	Clutch center holder	1
76	clutch center shaft	1
77	Special denting tools	1
78	Drawing board	10

79	T Square	10
80	Wire Brush	2
81	Chipping hammer	2
82	Blow Lamp	1
83	Cleaning brush	4
84	Floor brush	1
85	Taps and dies complete set in box	1
86	Twist drill metric 3mm*12mm*1mm-2 sets	1
87	Hand reamer or parallel shank 7.5 to 12 mm by 1.5mm	1
88	Painting brush	2
89	Micrometer-Inside/outside	2
90	Special purpose tool as per manufacture of two wheeler and four wheeler	1

MACHINES AND EQUIPMENTS

Sr. No.	Name	Qty
1	Bench drilling machine medium size	1
2	Pedestal grinder 1 HP motor wheel 10inch	1
3	Arc welding set	1
4	Compressor	1
5	Battery charger unit	1
6	Tube vulcanizing machine	1
7	Exhaust gas analyser	1
8	Printer	1
9	Computer	1
10	Car washing machine	1
11	Spray painting gun	1
12	Types of threads	1 each
13	Battery 6 V , 12 V Lead acid and dry	1
14	Animated automobile CDs	2
15	Model of four –stroke petrol engine	1

16	Model of four-stroke diesel engine	1
17	Model of two –stroke petrol engine	1
18	Sectional Petrol engine	1
19	Sectional Diesel engine	1
20	Sectional gear box	1
21	Sectional differential assembly	1
22	Model of Ignition system	1
23	Model of brake assembly with master cylinder	1
24	Old unserviceable engine 4-stroke petrol engine	1
25	Old unserviceable engine 4-stroke diesel engine	1
26	Old unserviceable engine 2-stroke petrol engine	1
27	Old unserviceable carburetor of - i) Hero Honda ii) Honda Active iii) Kinetic Honda iv) Scooter v) Maruti Car vi) Fiat car	1
28	Old unserviceable fuel injection pump	1
29	Old unserviceable nozzles	2
30	Old unserviceable front axle	1
31	Old unserviceable rear axle	1
32	L C D Projector with screen	1
33	Internet connection	1
34	Laptop	1
35	Spark plug tester	1
36	Injector Tester	1
37	Air Conditioning Model of car	1
38	Toe in gauge	1
39	Old radiator	1
40	Mechanical fuel pump	1
41	Electrical fuel pump	1
42	Vapouriser of LPG fuel supply system	1
43	Fuel feed pump	1
44	Old body components(door/fender/bonnet)	1
45	Accessories (old front bumper/carriage/wheel cap/steering cover/foot rest etc.)	1

46	Wheel alignment gauge	1
47	Tube vulcanizer	1
48	Connecting rod aligner	1
49	Camber angle bubble gauge	1

VEHICLES

Sr. No.	Name	Qty
1	Old unserviceable scooter shaft drive (two-stroke) Running condition	1
2	Old unserviceable motor cycle (four-stroke) Running condition	1
3	Old Jeep (Diesel) - Running condition	1
4	Old Car (Petrol) - Running condition (advance)	1

SAFETY EQUIPMENTS

Sr. No.	Name	Qty
1	Goggles for grinder	4
2	Goggles for welding	4
3	Welding glass shield	2
4	Apron	1
5	Hand gloves	4
6	Fire extinguisher(powder type)	1
7	Metal Stand for lifting car (ghodi)	4
8	First aid box	1
9	Stretcher	1
10	Sand bucket	2
11	Pad locks	4
12	Metal Racks	2
13	Steel Cupboard	3
14	Work benches with wooden top (6 X 4)	1
15	Pigeon hole locker	1

MEASURING INSTRUMENTS AND INSPECTION EQUIPMENTS

Sr. No.	Name	Qty
1	Outside caliper	4
2	Inside caliper	4
3	Vernier caliper	1
4	Depth gauge	1
5	Dial Indicator range 5 mm	1
6	Try square	4
7	Straight edge	1
8	Steel tape 5 meter	1
9	Pair of V Blocks	1
10	Special gauge for crown wheel and pinion adjustment	1
11	Surface gauge	1
12	Magnifying glass	1
13	Tyre pressure gauge	2
14	Screw pitch gauge	2
15	Tacometer	1
16	Multimeter	2
17	Angle plate	1
18	Surface plate	1

ELECTRICAL ITEMS

Sr. No.	Name	Qty
1	Heater	1
2	Soldering iron	2
3	Inspection Lamp	2
4	Electrical wire 50 mtr	1

5	Insulation Tape	3
6	Growler	1
7	Soldering flux	1
8	Voltmeter-DC-25 volt	1
9	Ammeter	1
10	Hydrometer	2
11	High rate battery cell tester	1
12	Coil and condenser tester	1
13	Spark plug cleaning and testing machine	1
14	Electrical Accessories:	
	i) Electrical horn	1
	ii) Horn relay	1
	iii) Electric bulbs different types	1
	iv) 12 v Head light side beam	1
	v) Electrical wiper unit	1
	vi) Electrical 12 v flasher	1
	vii) Electrical fuel pump	1

4: CONSTRUCTION TECHNOLOGY (K7, K8, K9)

Scheme of Examination

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Building Materials & Safety Management	80	3	80	3	20	10	10	200
2	Building Construction	80	3	80	3	20	10	10	200
3	Civil Engineering Drawing and AutoCAD	80	3	80	3	20	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Concrete Technology	80	3	80	3	10	10	10	10	200
2	Estimates and Contracts	80	3	80	3	10	10	10	10	200
3	Surveying	80	3	80	3	10	10	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Introduction

Construction Technology is introduced as a vocational course. This course is of two years. Students who have passed SSC are eligible for admission i.e. SSC passing is basic entry qualification for the course. Students get the facility of vocational education is formal education flow at +2 levels.

This vocational course is demand driven course. Construction industry is one of the largest industries in India. Millions of people are working in this field. It is demand of construction of construction industry to provide people at supervisor level to assist site engineer or project manager. In government sector there is demand for civil engineering assistant. Surveyor is the person who plays the important role in construction industry. These surveyors can be provided through this vocational education. Architectural assistant is demand of architectural field which can be fulfilled by this vocational education.

Qualified and skilled staff will be available at appropriate post in construction industry through this education due to best syllabus, teaching method training method, and individual guidance. The students who have passed this course can work as a construction contractor in government and private sector. This vocational course will provide employment and self employment oriented education to overcome the drawbacks in regular formal education.

There is continuous increasing in the population of India which is now participating in education rather than in the labour market. Skill Development initiatives under the National Skill Development Mission have played an important role in the process of vocational Education at 10+2 stage. The objectives of the curriculum are to enhance the employability of youth through this competency based modular vocational courses, to maintain students' competitiveness to fill the gap between the educated and the employable personnel. These courses are continued/revised keeping the foresight of future and directives of National Vocational Education Qualification Framework (NVEQF).

Salient features of this course are.

Demand driven course, Practical oriented training, Facility of on the Job Training, Industrial visits. Well equipped laboratories well designed theory and practical syllabus. Entrepreneurship Development Cell, Placement cell, Limited Seats, Individual Guidance, Government Driven and Granted Course Job Opportunities in government sector as well as in private sector, Provides facility of registration as government contractor, Provides apprentice training facility, further Education: Admission to II year diploma in Civil Engineering, Admission to BA, B.com, B.Cs, BBA, etc.

Objectives

- Employment in government & Semi Government sector at appropriate post like civil engineering assistant in PWD, ZP, CIDCO, MIDC, MHADA, MUNCIPAL CORP, Municipal Council, Grampanchayat etc.
- Building Construction Site Supervisor.
- Surveyor.
- Assistant Site Engineer.
- Technical Assistant.
- Sub Overseers.
- Assistant to Architect.
- CAD Draftsman.
- Material Testing Lab Assistant.
- Assistant to Junior Engineer.
- Estimator.
- Billing Assistant.
- Quality control Supervisor.
- Plumber.

Self employment

- As a registered government contractor, sub contractor, labour contractor, centering contractor.
- Manufacturer of fly ash bricks Building Material supplier, Trader of Construction material such as hardware, sanitary ware, manufacturer etc.

Std. XI

Paper I: Building Material and Safety Management (K7)

Objectives

To enable the students to

1. To know the materials used in building construction.
2. Acquire the knowledge of building materials used for construction of building elements.
3. To provide experts in quality testing of material in construction industry.
4. To produce a good quality supervisor replacing site engineer.
5. To provide assistant to quality control engineer.
6. To create lab assistants for building material testing laboratory.
7. To produce a technical assistant for material purchase department.
8. To create awareness about latest & modern building materials available in market.
9. To provide information for estimation.

10. To provide technically qualified and practically trained supervisors to building construction.
11. To create awareness about safety in building construction industry among the students.
12. To provide well known safety supervisors in building construction.

Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Stone	1.1 Introduction usefulness of stone in construction industry. 1.2 Types of stone from different rocks 1.3 Properties of different types of stones 1.4 Trading business of stone and its products.	06
2.	Aggregates	2.1 Introduction & Definition. 2.2 Type of aggregates according to source, size, shape etc. 2.3 Properties of aggregates. 2.4 Laboratory tests	10
3.	Bricks	3.1 Introduction, History of brick. 3.2 Soil Burnt bricks. 3.3 Fire bricks 3.4 Fly ash bricks 3.5 Concrete blocks (bricks). 3.6 Light weight bricks.	12
4.	Cement	4.1 Introduction and general information. 4.2 Definition of cement, and ingredients of cement and chemical compounds. 4.3 Types & grades of cement 4.4 Field tests of cement 4.5 Laboratory test of cement 4.6 Storage of cement.	12
5.	Steel	5.1 Introduction 5.2 Importance of steel in RCC Structure. 5.3 Types of steel hard, medium, mild. 5.4 Properties of steel. 5.5 Different forms of steel and uses. 5.6 Theoretical weight calculation of different forms of steel.	06
6.	Mortar	6.1 Introduction 6.2 Definition and function 6.3 Ingredients and function of each	08

		ingredient. 6.4 Types of mortar. 6.5 Preparation method of cement mortar. 6.6 Properties of good quality mortar 6.7 9 Additives/Adhesives in a mortar	
7.	Tiles	7.1 Introduction, general uses. 7.2 Properties of good quality tiles 7.3 Type of tiles 7.4 Ceramic tiles, Cement, clay, Stone, Artificial Tiles and Paving.	08
8.	Painting Materials	8.1 Preparation of Surface for paint. 8.2 White wash, Colour wash & Distemper 8.3 Types of paint. 8.4 Oil paint: 8.5 Wall papers	10
9.	Miscellaneous Materials	9.1 Introduction 9.2 Glass facade 9.3 Ferrous and non ferrous metal. 9.4 Damp proofing & waterproofing material.	08
10.	Health & Safety Management	10.1 Construction expectation 10.2 General construction rules 10.3 Alcohol and drugs 10.4 Emergency response procedure 10.5 First aid and medical services 10.6 Pre task planning 10.7 Safety communication and safety management by walking around. 10.8 Project hazardous material control 10.9 Pollution prevention 10.10 Solid waste management 10.11 Waste water management 10.12 Environmental Health and safety (EHS) rules	12
11.	Accidents and Safety	11.1 Accident prevention program. 11.2 Site safety program. 11.3 Personal protective kit 11.4 Major possible injuries and first aid. 11.5 Site rules and regulations.	12
12.	Possible Accidents, Precautions and Actions	12.1 Accidents at different stages 12.2 Excavation 12.3 Placing 12.4 Slab form work 12.5 Concreting of slab	12

		12.6 Removal of Centering & Shuttering of columns, beams, slabs etc. 12.7 Electrical works 12.8 Masonry and plastering work, painting work, Plumbing work. 12.9 Lift work. 12.10 Transportation. 12.11 Safety- Check list for every activity. 12.12 Health and safety management law.	
13.	Green Building	13.1 Concept of Green building 13.2 Green building standards. 13.3 Low energy building.	04
		Total	**120**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Stone**		
	1. Study of Market for stones and their market forms. Study of comparative rates, main source, price at main source, dealer/sub dealer/retailer's price taxes profit loss etc	16	By arranging visits or By arranging lecture of supplier
	2. Identification and use of different types of stones such as marble, granite etc.		Presenting collected samples.
	3. Durability test of different stones.		Demonstration
2.	**Aggregates**		
	1. Study of crusher project through PPT or recording & flow diagram.	30	LCD projector presentation
	2. Determine specific gravity and water absorption of aggregates.		Demonstration and individual Practicing.
	3. Determine the bulking of sand.		
	4. Determine clay and silt content in an aggregate.		
	5. Determine the crushing strength of an aggregate.		
	6. Determine the impact value of an		

	aggregate.		
	7. Determine fineness modules.		
3.	**Bricks**		
	1. To conduct Field tests of bricks to prove the quality of different types of bricks. Colour, surface texture, size, absorption etc.	20	Demonstration and individual Practicing.
	2. Efflorescence test of brick		
	3. Dimensions and tolerance test of bricks.		
	4. Determination of compressive strength of all types of bricks. Soil brick, fly ash, ACC, concrete bricks		Demonstration
4.	**Cement**		
	1. Fineness test of cement by using I.S. sieve no.9	30	Theory part : Class teaching by using LCD projector
	2. Field tests of cement to check its quality.		
	3. Consistency test of cement.		Demonstration and individual Practicing.
	4. Setting time tests(Initial setting time, final setting time)		
	5. Soundness test of cement.		
	6. Compressive Strength Test of cement.		Demonstration and practicing.
5.	**Steel**		
	1. Field tests of steel elasticity, corrosion, hardness, uniformity, standards, etc.	16	Classroom Teaching
	2. Identification & weight calculation of steel according to size.		Practical by demonstration & use of steel table
6.	**Mortar**		
	1. Preparation of cement mortar.	16	Demonstration and practicing.
	2. Workability test of mortar.		
7.	**Tiles**		
	1. Field tests of different tiles.	20	By Organising Planned and designed visit
	2. Visit to paving block manufacturing unit.		
	3. Visit to tile traders for market survey to study of comparative rates, main source, manufacturing price, dealer/sub dealer / retailer's price taxes profit loss etc.		
8.	**Painting Materials**		
	1. Visit to hardware paint shop &	20	By Organising

	Sanitary ware to study all and paints hardware material forms, their market rates, use, price of manufacturer, dealer, retailer, taxes on it		Planned and designed visit
9.	**Miscellaneous Materials**		
	1. Market survey for different building materials used in building construction.	16	By Organising market visit.
10.	**Health & Safety Management**		
	1. Study of Environmental Health and Safety (EHS) rules.	20	Demonstration and presentation by arranging safety workshop.
	2. Prepare a project on waste water management.		
11.	**Accidents & Safety**		
	1. Study of personal protective kit and its practical use	12	Showing the film on safety in building construction.
12.	**Possible Accidents, Precautions and Actions**		
	1. Prepare check list of safety for different construction activity and observe it on site.	12	Demo. By film and on site.
13.	**Green Building**		
	1. Prepare a project report on green building.	12	Film presentation Classroom teaching Laboratory working. Site visits.
		Total	**240**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Paper II: Building Construction (K8)

Objectives

To enable the students to

1. Awareness about terminology used in construction.
2. To know the Terminology in line out and each activity.
3. Identification of building elements.
4. To make aware about Importance of foundation in building construction.
5. Study of types of foundation.
6. Construction technology of each activity.
7. To study the skills used in building construction.
8. To acquire the different skills to be needed in building construction.

9. To learn the check lists of execution of each activity.
10. To develop the supervision skills among the students.
11. To learn the allied activities like plumbing.
12. To know the water proofing techniques.
13. To know about finishing activities.
14. To know about vertical transportations
15. To provide best technicians for construction industry.
16. To provide technically qualified & practically trained supervisors, quality control assistant, technical assistant etc. to construction Industry.
17. To provide the technically qualified and skilful contractor to construction industry.
18. To create special contractors for special activity like water proofing contractor, termite proofing contractor, painting contractor, tilling contractor, cladding contractor etc.

Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Building Elements and Terminology	1.1 Introduction. 1.2 Types of building. 1.3 Plot & related Terminology. 1.4 Lineout & related Terminology. 1.5 Building Terminology. 1.6 Sequence of building construction items.	06
2.	Foundation	2.1 Introduction. 2.2 Definition and function. 2.3 Loads on foundation 2.4 Points to be considered while selecting the type of foundation. 2.5 Bearing capacity of soil. 2.6 Types of foundation. 2.7 Causes for failure of foundation & remedial measures.	12
3.	Masonry Work	3.1 Introduction. 3.2 Technical terms in masonry work. 3.3 Types of brick masonry according to quality & material used. 3.4 Bonds in brick masonry. 3.5 Bonding of old work to new work. 3.6 Repairing of brick masonry. 3.7 Supervision points in brick masonry. (Check list for construction) 3.8 Construction of fly ash brick masonry. (Check list) 3.9 Construction of light weight brick masonry. (Check list) 3.10 Construction of concrete block	12

		masonry. (Check list) 3.11 Fire brick masonry work 3.12 Stone masonry 3.13 Technical terms. 3.14 Dressing of stone. 3.15 Types of stone masonry and their characteristics. 3.16 Method of stone masonry work. 3.17 Supervision points of stone masonry. (Check list)	
4.	Walls	4.1 Introduction. 4.2 Types of walls. 4.3 Load & non load bearing walls. 4.4 Retaining walls 4.5 Cavity walls. 4.6 Partition walls. 4.7 Glass cladding, glass partitions.	04
5.	Plastering & Pointing		
	A) Plastering	5.1 Introduction, definitions 5.2 Importance 5.3 Technical terms in plastering & pointing. 5.4 Types of plaster. 5.5 Application of plaster. 5.6 Curing of plaster. 5.7 Supervision points in plastering. 5.8 Defects in plaster and repairs of plaster	08
	B) Pointing	5.9 Introduction 5.10 Purpose of pointing 5.11 Types of pointing. 5.12 Application. 5.13 Repairing of old pointing. 5.14 Supervision points	06
6.	Roof and Roof Covering	6.1 Introduction, 6.2 Technical terms. 6.3 Type of roofs. 6.4 Pitched roof. 6.5 Flat roof. 6.6 Method of fixing AC sheets. Check list for construction. 6.7 Method of fixing GI sheets. Check list for construction. 6.8 Drainage arrangement of flat and pitched roof.	10
7.	Floors, Floorings and Cladding	7.1 Introduction 7.2 Technical terms used in floor &flooring. 7.3 Types of floor. 7.4 Advance materials used for flooring.	10

		7.5 Cladding 7.6 Check list for construction of flooring.	
8.	Doors & Windows	8.1 Introduction. 8.2 Technical terms related to doors and windows. 8.3 Location and sizes of doors &windows. 8.4 Types of doors and windows, and frames for it. 8.5 Types of doors & windows according to material used.	10
9.	Stairs & Stair Case	9.1 Introduction. 9.2 Technical terms. 9.3 Location of stair. Characteristics of Good staircase. 9.4 Classification of staircase.	08
10.	Plumbing	10.1 Introduction. 10.2 Technical terms. 10.3 Plumbing system. 10.4 Water supply system. 10.5 Assessment of water. 10.6 Service connection from authority. 10.7 Uses of different pipes. 10.8 Taps valves and cocks. 10.9 Water supply scheme for house. 10.10 Sanitary system. 10.11 Uses of different pipes 10.12 Fixing of different sanitary fittings. 10.13 Construction of septic tank. Sludge soak pit. 10.14 Drainage scheme for residential unit.	12
11.	Waterproofing and Damp proofing	11.1 Introduction. 11.2 Reasons of dampness. 11.3 Sources of dampness. 11.4 Material of damp proofing. 11.5 Material for water proofing 11.6 Methods of water proofing of flat roof. 11.7 Water proofing / damp proofing treatment to pitched roof.	10
12.	Painting	12.1 Introduction. Importance of painting. 12.2 Oil painting, Oil painting to new wood work. 12.3 Oil painting for old wood work. 12.4 Oil painting on steel work.(new / old) 12.5 Oil painting on plastered surface. 12.6 Oil painting on damp wall 12.7 Spray painting. 12.8 Distempering 12.9 Plastic painting.	12

		12.10 Exterior paints 12.11 Graining application 12.12 Defects in painting	
		Total	**120**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Building Elements and Terminology**	**18**	
	1. Visit to construction site to know the terminology.	8	Class teaching
	2. Reading of drawings required for line out.	4	Demonstration.
	3. Practical of Line out for load bearing structure.	2	Practicing for perfectness
	4. Practical of Line out for RCC structure.	4	
2.	**Foundation**	**20**	
	1. Construction of column footing foundation.	4	Class teaching.
	2. Construction of under- reamed pile foundation.	4	Presentation through LCD
	3. Visit to construction site to study the different types of foundation such as combined, continuous, cantilever footing, raft & pile foundation.	8	Demonstration and presentation. In lab. and on site
	4. Determination of bearing capacity of soil by penetration method.	4	Test in building yard.
3.	**Brick Masonry**	**24**	
	1. Construction of stretcher bond without/ kachha mortar.	4	Demonstration and Individual practicing. By using mortar without binding material.
	2. Construct a circular of wall of 2m diameter in header bond without/ kachha mortar.	4	
	3. Construct a brick wall from given drawing in English bond without/kachha mortar.	4	Theory by class room teaching.

	4. Construction of brick wall in Flemish bond from given drawing with kachha mortar.	4	Theory by class room teaching.
	5. Visit to construction site to study the different types of masonry works.	4	Organise Visits.
	6. Site visit to check the stone masonry work as per standard.	4	Inspection as per check list.
4.	**Walls**	**10**	
	1. Construction of cavity wall.	6	LCD presentation and Demonstration on site or in laboratory
	2. Prepare a check list of construction of different walls & implementation of it & study of R.C.C. band for partition walls.	4	
5.	**Plastering & Pointing**		
	A] Plastering	**20**	
	1. Application of Cement plastering. (Internal & external)	8	Demonstration in college by arranging experts.
	2. Application of Cement plastering. (Internal & external) Application of Gypsum plastering.	8	Demonstration in college by arranging experts. And individual Practicing.
	3. Prepare a check list of pointing for supervision and implementation of it.	4	
	B] Pointing	**4**	
	4. Visit to pointing work to study the pointing method.	4	Demonstration on site.
6.	**Roof and Roof Covering**	**20**	
	1. Draw the different types of roofs.	4	Demonstration in college by arranging experts
	2. Fixing of roofing sheets. (GI & AC)	8	
	3. Study of the RCC slab /Roof Casting method.	8	
7.	**Floors, Flooring and Cladding**	**30**	
	1. Prepare the vitrified tile flooring, without using binding material minimum 10 sq. m.	6	By arranging skilled tile fitter as demonstrator in college Or on site demonstration Individual Practicing.
	2. Fixing of paving blocks to prepare flooring without binding material minimum 10sq.m.	8	
	3. Wall tilling by preparing surface on minimum 5sq.m	8	
	4. Stone tile cladding	8	
8.	**Door & Windows**	**12**	

	1. Construction of different types of doors.	4	Demonstration in laboratory By using doors prepared for demonstration. Demonstration at Collaborated or linked workshop.
	2. Construction of aluminum sliding window.	8	
9.	**Stairs & Stair Case**	**8**	
	1. Study of different types of stairs, by sketching and with the help of models.	4	Demonstration in laboratory.
	2. Construction of RCC dog logged stair.	4	
10.	**Plumbing**	**36**	
	1. Threading to various G.I. Pipes.	4	Demonstration In laboratory
	2. Join different types of pipes by using proper fittings. (GI, UPVC, CPVC, PVC etc.)	4	
	3. Fixing of different taps and valves by using necessary fittings.	4	
	4. Laying the RCC, SW, PVC & CI pipes.	4	
	5. Fixing of wash basin.	4	
	6. Fixing Indian WC pan.	4	
	7. Fixing of commode (flooring, wall hung)	4	
	8. Fixing of sink.	4	
	9. Fixing of urinal pot.	4	
11.	**Water Proofing and Damp proofing**	**18**	
	1. Laying of Brick bat water proofing.	8	Demonstration In laboratory
	2. Laying of tar felt water proofing.	2	
	3. Application of water proof coating.	4	
	4. Application of crack filler to external surface.	4	
12.	**Painting**	**20**	
	1. Application of distemper.	4	By arranging Expert's demonstration in laboratory or on site. And practicing.
	2. Application of plastic / lustre paint.	4	
	3. Application of cement paint/external paint.	4	
	4. Application of oil paint.	4	
	5. Graining application in painting.	4	
		Total	**240**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Paper III: Civil Engineering Drawing by Autocad (K9)

Objectives

To enable the students to

1. To impart the drafting skills among the students.
2. To impart the knowledge to students about rules and regulations regarding submission drawing.
3. To produce best civil draftsmen to construction industry.
4. To Impart drafting skills among the students through AutoCAD software.
5. To develop the student as a best supervisor.
6. To develop the skills of reading of all types of drawings for implementation.
7. To make students as technically and practically perfect personnel in construction industry.
8. To impart knowledge to students for work as per drawing.
9. To produce assistant to architect.
10. To Impart basic interior designing skills.

Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Engineering Drawing	1.1 Introduction 1.2 Importance of engineering drawing	02
2.	Drawing Materials and Instruments	2.1 Drawing materials and their usage. 2.2 Drawing instruments and their usage.	02
3.	Lines, Lettering & Freehand Sketching	3.1 Types of lines and their application in drawing 3.2 Lettering. Introduction and importance 3.3 Proportioning in lettering. 3.4 General rules in lettering. 3.5 Types of lettering. 3.6 Free hand sketching meaning, necessity and sketching practice.	04
4.	Dimensioning	4.1 Introduction and importance 4.2 Types of dimensioning 4.3 General rules for dimensioning	02
5.	Orthographic Projections	5.1 Introduction. Principles of orthographic projection. 5.2 Methods of orthographic projections. 5.3 Orthographic projections of simple objects.	08
6.	Sections	6.1 Introduction and importance 6.2 Method's for representing section. Various material conventions and sections.	08

		6.3 Sections of simple objects.	
7.	Building Measurement and Drawing	7.1 Introduction, different type of buildings residential, industrial, hospital, market, school and bus stands etc. 7.2 Understanding of plan, elevations and section for building drawing. 7.3 Building components and their drawing symbols 7.4 Measuring units for building measurement and their conversions. 7.5 Area calculations. Plinth area, built up area and carpet area	10
8.	Building Rules and Regulations	8.1 Extract from building rules and bye laws: Documents and plans Number of copies, Undertaking from supervisor 8.2 Submission drawings List of drawings, documents, and scales for different drawings. Drawing lay out, No. copies for submission Tracing , ammonia printing, 8.3 General/ zoning regulations – residential, agricultural and industrial. Rules and regulations for different zones. 8.4 Regulations regarding layout of building – Ground coverage, side margins, restriction on room sizes, stairs, Openings, parking provision, height restrictions, floor space index (FSI) calculations 8.5 Area calculation and tabulations as per statutory requirements.	10
9.	Working Drawing	9.1 Introduction, necessity and 9.2 Drawings for execution. Site plan, Plan, elevation, and sections through various places, lay out plan of buildings garden, internal roads, water lines, drainage lines etc. 9.3 Drawing for building components like stairs, door/ window details, toilets fittings, kitchen, flooring etc. 9.4 Plumbing drawing.	10
10.	Interior Design	10.1 Introduction and importance of interior designing 10.2 Space utilization concepts. 10.3 To enable to design and develop residential interior and to learn essential skills of space planning & furniture & finishes.	08

11.	Computer aided drawing (CAD)	11.1 Usage of CAD software for drawing with computer. 11.2 Different available CAD software. 11.3 Introduction to CAD software screen/ GUI. 11.4 Different methods of input. 11.5 Different co-ordinate systems used in CAD software. 11.6 Opening/ viewing and saving CAD drawing.	06
12.	Commands	12.1 Draw commands:- Draw lines using different co-ordinate system, like Cartesian, system, and relative co-ordinate system, polar co- ordinate system. Drawing circle, rectangle and polygons. Object selection method, erasing drawing, undo and redo commands Drawing poly lines. Different Environments like Snap, grid and Ortho, etc similar commands. 12.2 Editing Selecting Objects for Editing Moving Objects, Copying Objects, Rotating Objects, Scaling Objects, Mirroring Objects, offset, Hatch, Rotate, Move, Array, Blocks, Editing with Grips etc. Text in Drawing, Types and Modifying 12.3 Modifying Commands:-working with annotations, adding text in a drawing, modifying multiline text, formatting multiline text, adding notes with leaders to your drawing. Creating tables. 12.4 Dimensions:- Dimensioning Concepts Adding Linear Dimensions Adding Radial & Angular Dimensions Editing Dimensions 12.5 Layers: Concepts of layer, Layer states, Changing an object layer Modifying different properties of layer. 12.6 Hatching:- Hatching, Editing hatches.	10
13.	Advanced Editing Commands	13.1 Trimming and extending objects. Stretching objects. Creating files and chamfers Offsetting objects Creating arrays	14

		of object 13.2 Inserting blocks:- Concept of block Inserting block Editing of block 13.3 Setting up of layouts:- Working in lay outs Creating and arranging drawing in viewports. Guide lines for layout. 13.4 Printing drawing:- Printing layouts Printing from model tab.	
14.	Building Drawing using CAD	14.1 Building components drawing: Foundation, doors, windows, staircase, roof, flooring etc. 14.2 Submission drawings:- demarcation drawings. site plan, key plan, location plan, block plan, floor plans, elevation, section passing staircase, section passing through wick., schedule of doors and windows *	26
		Total	**120**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Lines, Lettering & Freehand Sketching**	**12**	
	1. Draw different types of lines lettering and conventional symbols used in building construction.	4	Student will be able understand and draw the basic engineering drawings.
	2. Draw sanitary fittings and fixtures by free hand sketching.	4	Demonstration On Board and practicing.
	3. Construction of geometrical figures.	4	By class teaching and giving assignment
2.	**Dimensioning**	**4**	
	1. Draw a figure showing rules for dimensioning.	4	By preparing drawing sheets accordingly.
3.	**Orthographic Projections**	**16**	
	1. Draw orthographic projections of given simple object by first angle method, enough practice and 5 to 8 examples.	8	By preparing drawing sheets accordingly.
	2. Draw orthographic projections of simple object by third angle	8	By preparing drawing sheets accordingly.

	method, enough practice and 5 to 8 examples.		
4.	**Sections**	**8**	
	1. Draw sections in the above topics 5 to 8 Examples.	8	By preparing drawing sheets accordingly.
5.	**Building Measurement and Drawing**	**24**	
	1. Sketching practice of various components of Building e.g. Foundation, floors, stairs and stair cases, doors and windows, different types of roofs.	14	Demonstration On Board and practicing.
	2. Measurement of existing building. Preparation of the existing building plan.	10	
6.	**Building Rules and Regulations**	**50**	
	1. Preparation of line plan for a few type of buildings.	14	Demonstration On Board and practicing.
	2. Preparation of detailed plan, elevation and section for one building.	14	
	3. Preparation of the submission drawing for small residence ground only structure as per local statutory guidelines.	22	
7.	**Working Drawing**	**16**	
	1. Preparation of RCC drawing for at least two building components with important reinforcement detailing.	16	Demonstration On Board and practicing.
8.	**Computer Aided Drawing (CAD)**	**4**	
	1. Introduction to CAD software & commands used.	4	Demonstration on LCD projector and Individual practicing.
9.	**Commands**	**48**	
	1. Draw different geometrical figures by using different CAD Software commands.	8	Demonstration on LCD projector and Individual practicing.
	2. Draw given objects by using different commands used in CAD software.	8	Demonstration on LCD projector and Individual practicing.
	3. Drawing of various components of Building e.g. Foundation, floors, stairs and stair cases, doors and windows, different types of roofs using CAD software.	18	Demonstration on LCD projector and Individual practicing.
	4. Measurement of existing building.	14	Demonstration on LCD

	Preparation of the existing building plan using CAD software.		projector and Individual practicing.
10.	**Building Drawing using CAD**	**58**	
	1. Preparation of the submission drawing for small residential structure as per local statutory guidelines Preparation of detailed plan, elevation and section for one two storied building using CAD software	26	Demonstration on LCD projector and Individual practicing.
	2. Preparation of RCC drawing for building components with important reinforcement detailing using CAD software.	16	Demonstration on LCD projector and Individual practicing.
	3. To Design the interior for living, Kitchen and Bed room.	16	Demonstration on LCD projector and Individual practicing.
		Total	**240**
Industrial visits & visits for market survey should be performed & well organised at linked industry or traders.			

Std. XII
Paper I: Concrete Technology (K7)

Objectives

To enable the students to

1. To aware the students about very important technology
2. To impart the knowledge about quality control
3. To impart testing skills among the students
4. To impart execution skills of concreting activity
5. To impart quality control skills in RCC
6. To impart knowledge of erection of formwork.
7. To impart knowledge for preparation of reinforcement for different activities.
8. To develop the supervision skills of students.

Theory

Sr. No.	Unit	Sub-Unit	Periods
1.	Introduction	1.1 Brief introduction, definition, 1.2 Properties of concrete 1.3 Uses of concrete 1.4 Types of concrete.	04

2.	Ingredients of Concrete	2.1 Cement: physical properties of cement. 2.2 Aggregates: classification of aggregates according to size and shape. 2.3 Grading of Aggregate: Fineness modulus. 2.4 Water: Quality required as per IS 456-2000.	08
3.	Properties of Concrete	3.1 Properties of fresh concrete. 3.2 Properties of concrete in harden state.	08
4.	Water Cement Ratio	4.1 Principle of water-cement ratio law/ Duff Abram's water-cement ratio law: 4.2 Relation between water cement ratio and strength.	06
5.	Workability	5.1 General, definition, concept of internal function. 5.2 Factors affecting workability. 5.3 Measurement of workability.	08
6.	Concrete Mix Design	6.1 Concept of mix design. 6.2 Variables in proportioning & various method of proportioning 6.3 Introductions of various grades of concrete as per IS456-2000, proportioning for normal mix as prescribed by IS 456-2000 and adjustment on site for bulking of fine aggregate, water absorption, and workability.	12
7.	Admixtures	7.1 Introduction. 7.2 Classification of admixtures- 7.3 Accelerators 7.4 Retarders 7.5 Air entraining agents. 7.6 Super plasticizers. 7.7 Other Admixture.	08
8.	Special Concretes	8.1 Introduction, 8.2 Light weight concrete. 8.3 Aerated concrete 8.4 High density concrete 8.5 Sulphur infiltrated concrete. 8.6 Fibre reinforced concrete 8.7 Cold weather concreting. 8.8 Hot weathering concrete. * 8.9 Ready mix concrete.	08
9.	Conducting Operations	9.1 Storing of cement. 9.2 Storing aggregates. 9.3 Batching of ingredients. 9.4 Mixing of ingredients. 9.5 Transportation of concrete. 9.6 Placing of concrete.	12

		9.7 Compaction of concrete 9.8 Curing of concrete. 9.9 Jointing. 9.10 Defects in concrete. 9.11 Check list of different stages.	
10.	Reinforcement in Concrete	10.1 Introduction. Terminology in RCC & Introduction to all RCC members. 10.2 Tools and equipments required For bar cutting & bending. 10.3 Properties of reinforcement steel. 10.4 Checklist for reinforcement for different RCC members.	14
11.	Form Work	11.1 Introduction, Objects of form-work, properties of good quality form-work. 11.2 Types of formwork as per material used in formwork. Advantages of different materials used for formwork.* 11.3 Erection method of Form works for different RCC members. 11.4 Checklists for formwork of different RCC member.	08
12.	R.C.C. Structural Member	12.1 Reading and interpretation of RCC members. * 12.2 Checklists for construction of different RCC member.	16
13.	Scaffolding	13.1 Introduction. 13.2 Purpose of scaffolding. 13.3 Material used for scaffolding. 13.4 Characteristics of good scaffolding. 13.5 Types of scaffolding. 13.6 Various types of rope knots metal coupling, 13.7 Erection of scaffolding. 13.8 Checklist for different scaffolding.	08
		Total	**120**

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Ingredients of Concrete**	**16**	
	1. To determine the F.M. of aggregates.	8	Student will be

			able understand and draw the basic engineering drawings.
	To determine specific gravity and water absorption.	8	Demonstration and Practicing.
2.	**Properties of Concrete**	**8**	
	1. To determine the compressive strength of concrete.	8	Demonstration and Practicing Method
3.	**Water Cement Ratio**	**8**	
	1. Perform and analyse the effect of water cement ratio on strength of cement.	8	Demonstration and Practicing Method
4.	**Workability**	**12**	
	1. To determine the workability of concrete by slump cone.	4	Demonstration and Practicing Method
	2. To determine workability of concrete by compaction factor test method.	4	
	3. To determine the slump by K slump tester.	4	
5.	**Concrete Mix Design**	**24**	
	1. To design the concrete mix for various strengths:- m100, m200, m250, etc.	16	Demonstration and Practicing Method
	2. To determine the bulking of sand.	4	
	3. To determine water content in aggregates.	4	
6.	**Special Concretes**	**8**	
	1. Visit to ready mix plant.	8	Observation VCD presentation
7.	**Conducting Operations**	**24**	
	1. Study of store on site.	4	Demonstration and Practicing Method
	2. Non destructive test on hardened concrete: Rebound hammer method Ultrasonic pulse velocity test.	8	

	3. Core testing for compressive strength.	4	
	4. Visit to construction site study the machinery and equipments used in construction industry.	8	Organise site visit
8.	**Reinforcement Concrete**	**48**	
	1. Prepare reinforcement for footing.	6	Demonstration and Practicing Method
	2. Prepare reinforcement for ckeâolumn.	6	
	3. Prepare reinforcement for beam.	6	
	4. Prepare reinforcement for slab –one way, two way, PT slab, continuous & cantilever, etc.	8	
	5. Prepare reinforcement for lintel and chajja.	6	
	6. Prepare reinforcement for stair.	8	
	7. Prepare reinforcement water tank.	8	
9.	**Formwork**	**56**	
	1. Erection of form work for RCC lintel and chajja.	8	Demonstration and Practicing Method
	2. Erection of formwork for RCC pardi.	8	
	3. Erection of formwork column footing.	4	
	4. Erection of form work for column.	8	
	5. Erection of formwork for beam slab.	8	
	6. Erection the formwork for staircase.	8	
	7. Erection of formwork for lift case.	8	
	8. Erection of formwork for round column.	4	
10.	**R.C.C. Structural Member**	**36**	
	1. Visit to construction site to know the reinforcement and formwork method for different activities.	12	Demonstration and Practicing Method
	2. Visit to construction site to study the concreting operations of various items.	4	
	3. Visit to ready mix plant.	4	

	4. Scaffolding	08	
	5. To erect different types of scaffoldings.	08	Demonstration and Practicing Method
		Total	**240**
Practical should be conducted in demo lab for more practice. Demo lab should be well designed and well equipped. Visits should be arranged at only linked and collaborated construction industry for effective results.			

Paper II: Estimates and Contracts (K8)

Objectives

To enable the students to

1. Candidate should be enabled to read engineering drawing.
2. To learn construction process of building items with respect to requirement material, their proportion and labour, tools & plants, equipments.
3. To understand qualitative difference as per specifications & rates of building material.
4. To understand cost relationship with respect to quality and quantity of building construction.
5. To enable for taking out measurements of building items.
6. To enable for computation of quantity of building items.
7. To enable to compute quantity of material for building items.
8. To enable for rate analysis and cost assessment.
9. To enable to prepare tenders.
10. To study the different contract methods.
11. To study different (construction) execution procedure.
12. To study different bills.
13. To study the construction store as store keeper.
14. To understand the responsibilities as building site supervisor/work supervisor/master clerk.

Theory

Sr. No.	Unit	Sub-Unit	Period

1.	Introduction to Estimates	1.1 Introduction 1.2 Definition of Estimate terms used in estimates. 1.3 Purpose of Estimate	04
2.	Types of Estimates	2.1 Types of Approximate Estimates. 2.2 Detailed Estimate 2.3 Comparison between approximate and detailed estimates.	04
3.	Measurement of Building Work	3.1 Methods of Measurement – 3.2 Rules for measurement. 3.3 Units of measurement for different items.	04
4.	Detailed Estimates	4.1 Data required for preparing Estimate 4.2 Steps in Preparation of Detailed Estimate 4.3 Various forms in Estimate –	04
5.	Specifications	5.1 Introduction 5.2 Definition, points to be included specifications 5.3 Importance of specifications. 5.4 Types of Specifications 5.5 Points to be noted while preparing specification. 5.6 Specifications for different items.	06
6.	Quantities of Materials	6.1 Introduction, points to be taken into consideration for material calculations. 6.2 Importance of material calculation. 6.3 Calculation of Quantities of Material for different items.	12
7.	Rate Analysis	7.1 Introduction. 7.2 Importance/necessity 7.3 Data required for Rate analysis. 7.4 Factors affecting analysis of rates 7.5 Analysis of rate for various items.	14
8.	Taking out Quantities/Quality Surveying	8.1 Introduction 8.2 General, Points to be considered while taking out quantities 8.3 Rules for taking out quantities. 8.4 Methods of taking out Quantities 8.5 Quantity survey for simple items.	18
9.	Construction Planning	9.1 Classification of construction 9.2 Planning – 9.3 Resources of construction 9.4 Construction team 9.5 Construction organization in government sector such as PWD, ZP, Municipal corporations.	08
10.	Construction	10.1 Introduction ,General Idea 10.2 Types of labor	08

	Labour	10.3 Labour acts.	
11.	Quality Control	11.1 Meaning, definition, importance. 11.2 Necessity of quality control. 11.3 Stages in quality control. 11.4 Major items for quality control. 11.5 Quality control of different items.	10
12.	P.W.D. works	12.1 Classification of P.W.D.works 12.2 Method of carrying out works- Department and contract. 12.3 Preparation of bill, Types of bill 12.4 Important points to be considered while checking bill. 12.5 Rules for MB writing.	08
13.	Contracts	13.1 Introduction, definition. 13.2 Different types of contract 13.3 Contract documents.	10
14.	Tender	14.1 Introduction, definition, General Idea. 14.2 Concept of quotation & tender 14.3 Types of tender, types according to cost and nature. 14.4 Stages in tender preparation 14.5 Tender notice. 14.6 Submission of tender. E-tendering. 14.7 Scrutiny of tender. 14.8 Work order. 14.9 Deposit works. 14.10 Earnest money and security deposits penalty. 14.11 Types of submission of tenders. 14.12 Tender documents. 14.13 Documents for registration as a contractor.	10
		Total	**120**

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Types of Estimates**	**8**	
	1. To calculate the different types of areas of existing building. Such as plinth area carpet area, covered area, built up area.		Class teaching For Theory

			And Field work for Practical.
2.	**Measurement of Building Work**	**16**	
	1. To take measurement of different items executed and calculate the quantities by proper method of measurement.		Practical in suitable and convenient Site by demonstration And actual practicing to student.
	1. Take all measurements in FPS. Method and convert it into MKS units for calculating quantities of different items.		
3.	**Detailed Estimates**	**8**	
	1. To prepare a sheets used in estimation, measurement sheet, abstract sheet, composite form measurement and coast.		Class Teaching
4.	**Specifications**	**12**	
	1. To prepare specification for excavation work.		Class Teaching
	2. To prepare a specification for RCC work.		
	3. To prepare specification for B. B. Masonry.		
	4. To prepare specification for Plaster.		
	5. To prepare specification for painting.		
	6. To prepare specification for flooring. (Selective item should be performed)		
5.	**Quantities of Materials**	**36**	
	1. Calculate the quantities of materials for different items.		Class Teaching
	2. Brick Masonry (for different proportions)		
	3. PCC (for different proportions)		
	4. Stone masonry (all types with different proportions)		
	5. Plastering 12mm thick,20mm thick (different proportions)		

	6. Pointing (different proportions)		
	7. RCC (with different proportions)		
	8. White washing and color washing.		
6.	**Rate Analysis**	**36**	
	1. Prepare the rate analysis for different construction items.		Class Teaching
	a. Earthwork in Excavation		
	b. PCC / RCC		
	c. Brick Masonry		
	d. Stone Masonry		
	e. Cement Plaster		
	f. Pointing		
	g. White washing		
	h. Distempering		
	i. Oil Painting		
	j. Cement Paint		
7.	**Taking out Quantities/Quality Surveying**	52	
	1. Calculate the quantities of different items for construction of compound wall from given drawing.		Class Teaching
	2. From given drawing of steps calculate the quantities of different construction items		Class Teaching
	3. Calculate the quantities of simple column footing from given drawing		Class Teaching
	4. Calculate the quantities of different items of RCC trapezoidal footing from given drawing.		Class Teaching / Laboratory Teaching
	5. Calculate the quantities of different items required for construction of circular and semicircular steps from given drawing.		Class Teaching
	6. Calculate the quantities of different items for rectangular water tank constructed in brick masonry by using both long wall –		Class Teaching

	short wall and centre line method from given drawing.		
	7. Calculate the quantities of different items for circular water tank from given drawing.		Class Teaching
	8. Calculate the quantities of different items for two rooms from given drawing by using long wall-short wall and centre line method.		
	9. Calculate the quantities of different items for three rooms from given drawing by using long wall-short wall and centre line method.		
	10. Calculate the quantities of different items for four rooms having toilet blocks from given drawing.		Laboratory teaching. Practicing by Giving Assignment.
	11. Calculate the quantities of different items for four roomed bungalow constructed in RCC from given drawing.		
	12. Calculate the quantities of different items for two storied RCC building from given drawing and prepare detailed estimate for this.		
8.	**Quality Control**	**16**	
	1. Prepare a checklist of quality control for RCC work and implement it on any construction site. Prepare a report of quality control.		Class Teaching
9.	**Works**	**16**	
	1. Take measurements of completed items and enter it into measurement book with all rules.		Class Teaching
	2. To prepare a bill from MB and DSR.		
10.	**Contracts**	**12**	
	1. Visit to PWD/Govt. office to study Different contract methods, tender Methods, and documents used for it.		Oraganise Visit
11.	**Tender**	**28**	
	1. Prepare a project:		Class teaching. Demonstration and arranging
	2. Draw four room plan of bungalow (ground floor) using AutoCAD Software.		
	3. Submission Drawing /2 packets, 3packets.		

	4. Working drawing.		Workshop To Impart Knowledge Of tender procedure for getting work.
	5. Detail Estimate for same.		
	6. Prepare a Tender form.		
	7. Prepare a Tender notice.		
	8. Submission of Tender, E-tendering.		
	9. Tender Opening stages.		
	10. Stages in Scrutiny.		
	11. Prepare a Work order.		
	12. Execution procedure		
		Total	**240**
Student should be perfect in estimation by practicing in both theory and practical. Student should be able to fill tenders for getting govt. Works, encourage the students for the same.			

Paper III: Surveying (K9)

Objectives

To enable the students to

1. To read all types of maps.
2. To read revenue land record maps.
3. Perform survey to prepare maps.
4. Perform survey to prepare layout and mark the plots.
5. To collect information for fulfillment at objectives
6. To mark the layout in the plot for the proposal construction.
7. To determine topography of land. (Rise and fall of the ground level)

Theory

Sr. No.	Unit	Sub-Unit	Period
1.	Fundamentals of Surveying	1.1 Meaning, importance and need of surveying 1.2 Different type of survey 1.3 Equipments	08

		1.4 Fundamentals of land survey	
2.	Chain Surveying	2.1 Linear survey methods, chain and its types, optical square, cross staff, locating ground feature by offsets – field book, conventional symbols, plotting chain survey and computation of areas, errors in chain Surveying and their elimination.	12
3.	Compass Surveying	3.1 Principles and use of prismatic compass, adjustments, Bearings. 3.2 Local attraction and its adjustments. 3.3 Method of Chain and compass surveying of an area. 3.4 Adjustments of traverse. 3.5 Errors in compass surveying and precautions	14
4.	Plane Table Surveying	4.1 Study of Equipment 4.2 Orientation 4.3 Methods of Plane Tabling, Three Point method.	14
5.	Leveling	5.1 Introduction and principles of Dumpy Level, 5.2 Basic definitions, 5.3 Detail of dumpy Level and use of Dumpy Level in surveying, 5.4 Temporary adjustment of Levels, Sensitiveness of bubble tube; 5.5 Methods of leveling – Differential, Profile & fly Leveling, 5.6 Effect of curvature and refraction, Automatic levels, 5.7 Plotting longitudinal sections and Cross sections; 5.8 Measurement of area and volume	16
6.	Contouring	6.1 Introduction to Topographic Map, 6.2 Characteristics of Contour. 6.3 Contour Interval. 6.4 Methods of Locating Contours, 6.5 Interpolation of Contours	12
7.	Auto Level & Digital Level	7.1 Introduction and use of Auto level. 7.2 Introduction and use of Digital level for multiple leveling	14
8.	Theodolite Survey	8.1 Component parts of transit theodolite 8.2 Measurement of horizontal angles 8.3 Co-ordinate & transverse table. 8.4 Digital Theodolite Construction and uses 8.5 Determination of horizontal of vertical angles and also slopes	16
9.	Total Stations	9.1 Introduction to total station survey 9.2 Method of using the total stations for surveying, free station surveys, tie distance, remote height 9.3 Computations (COGO) 9.4 Longitudinal and Transverse profiles	14

		9.5 Contour map, cut and fill volumes staking out, cross station reference line, road program	
		Total	**120**

Practical

Sr. No.	List of Practicals	Periods	Procedure to Perform Practicals
1.	**Fundamentals of Surveying**	**24**	
	1. Study of various instruments like Tapes, Chains, Cross-Staff, Optical square, Line Ranger, Ranging Rods.	8	Demonstration
	2. Direct Ranging For minimum 50 meter length.	8	
	3. Indirect Ranging taking some obstacles minimum 50 mater length.	8	
2.	**Chain Surveying**	**36**	
	1. To Plot & To determine area by chain surveying by Triangulation Method.	8	Class Teaching
	2. Study of various symbols used in surveying.	4	Demonstration
	3. To calculate the area of field with plotting by cross-staff surveying.	8	Practicing
	4. Setting out right angles by Optical Squares.	8	
	5. Ranging by Line rangers.	8	
3.	**Compass Surveying**	**16**	
	1. Study of Prismatic Compass.	8	
	2. To Plot & To Calculate area of field by Compass Surveying.	8	
4.	**Plane Table Surveying**	**16**	
	1. To Plot & To Calculate area of given field by Plane table surveying (radiation and orientation method)	16	
5.	**Leveling**	**40**	

	1. Study of Dumpy Level.	4	Class Teaching Demonstration Practicing
	2. Reading the leveling staff.	8	
	3. Practice in recording & finding reduce level by collimation method.	4	
	4. Practice in recording & finding reduces level by rise and fall method.	8	
	5. Taking fly levels for distance of 2.0km.	8	
	6. Profile leveling for Road Project.	8	
6.	**Contouring**	**16**	
	1. Study of Contour with Characteristics.	4	
	2. Plotting cross-sections of field with drawing contour.	12	
7.	**Auto Level & Digital Level**	**24**	
	1. Study of Auto Level.	8	Class Teaching
	2. Leveling Practice by Auto Level by Rise & Fall Method. 3. Recording levels in Field Book with check complete.	8	Demonstration
	4. Leveling Practice by Auto Level by Collimation Plane Method. 5. Recording levels in Field Book with check complete.	8	Practicing
8.	**Theodolite Surveying**	**32**	
	1. Study of theodolite	8	Class Teaching and Demonstration
	2. Adjustment & setting of theodolite	12	Demonstration of instrument and Practicals
	3. Taking readings and recording those readings in the field book	12	
9.	**Total Stations**	**36**	
	1. Study of total stations	4	Demonstration and Practicals
	2. Method of using the total station survey	8	
	3. Calculations/Computations (COGO)	8	

	4. Study of contour maps	8	
	5. To draw cross section and road program	8	
		Total	**240**

REFERENCE BOOK

Sr. No.	Name of the book	Authors & Publications
1	Building construction	B.C. Punmia
2	Construction Management	Vajrani & Chandola
3	Construction Management	Harpal Singh.
4	Building Construction	Sushil Kumar
5.	Building Construction	Rangwala.
6.	Building Material	Chaudhari
7.	Concrete Technology	M.S. Shetty/ S CHAND.
8.	Concrete Technology.	S.S. Chaudhari/ NIRALI
9.	Building Material and Construction.	RK Jain,V.R. Phadke/ Nirali
10.	Practical Building Construction & its Management.	Mantri Publication
11.	Building Construction	W.B. Mckay
12.	Surveying	B.C. Punmia
13.	Cement Concrete Mix Design	M. Y. Sabnis
14.	Surveying- Vol. 1, Vol. 2	Kanitkar and Kulkarni
15.	Building Drawing	Shah, Kale, Patki,
16.	Building Drawing	Y. S. Sane
17.	Building Drawing	Guru Charan Singh
18.	RCC Design	Shah , Kale
19.	National Building Code ,BIS, New Delhi	BIS, new Delhi.
20.	Water Supply and Sanitary Engineering	S.C. Rangwala
21.	Water Supply and Sanitary Engineering	J. S. Birdie
22.	Building Material	Harpalsingh
23.	Introduction to CAD	D.D. Vaisonet, publisher: Mc Graw Hill, New Delhi
24.	The ABC's of AUTOCAD	Alan and Miller Published by BPB pub
25.	Mastering AUTOCAD	George Omura Published

26.	Inside Auto CAD the ABC's of Auto CAD 2004	Racker and Rice Alan Miller Technical Publication Singapore.
27.	Auto CAD Practice	BPB Publishers New Delhi.
28	Estimating and Costing	B.N. Dutta
29	Estimating and Costing	Vazirani & Chandola
30	Building Construction, Vol. 1. to 4	W.B. Mackey
31	Construction Foundation Engg.	Bharat Sing
32	Estimating and Costing	Chakrabourti
33	Contract and Accounts	B.S. Patil
34	Notes for Computer Course Auto CAD	Fadake, Moghe.
35	Concrete Technology	K.C. Krishnaswami. & A.A. Khandekar Publication Dhanpatray.

MACHINERY AND EQUIPMENTS REQUIRED

SR	PARTICULAR	QTY
1	LCD PR0JECTOR WITH LAPTOP	1
2	COMPRESSIVE STRENGTH TESTING MACHINE (DIGITAL)	1
3	SET OF MOULDS CONCRETE & MORTAR CUBES 150 MM, 70.5MM (4 Nos each)	1
4	K SLUMP TESTER	1
5	SLUMP CONE SET	2
6	COMPACTION FACTOR APPARATUS	1
7	VICAT'S APPARATUS WITH ALL ATTACHMENTS.	1
8.	SIVE ANALYSIS SET FINE & COARSE	1
9	ELECTR0NIC WEIGH BALANCE (SENSITIVE BALANCE)	1
1O	SIEVES FOR FINENESS OF CEMENT SIEVE NO. 9	
11	VIBRATING MACHINE (12000 RPM+/-400)	1
13	WEIGHING BALANCE (100KG)	1
14	MINI CONCRETE MIXER.	1
15	CONCRETE NEEDLE VIBRATOR	1

16	TILE CUTTER MACHINE	2
17	TILE POLISHING MACHINE (WITH DIFFRENT NUMBER STONES)	1
18	BAR BENDING MACHINE	1
19	POWER CUTTER	1
2O	DRILLING MACHINE	2
21	METAL TRAY SET	2
22	CORE CUTTING MACHINE WITH ATTACHMENT	1
23	MECHANICAL RAMMER (COMPACTOR)	1
24	MONO BLOCK PUMP SET	1
25	MASONRY GRINDER	1
26	REBOUND HAMMMER.(NORMAL)	1
27	REBOUND HAMER (DIGITAL)	1
28	VIBRATING TABLE FOR MOULD	1
29	CONCRETE(HARDENED) TESTING KIT	1
30	AGGREGATE IMPACT VALUE APPARATUS	1
31	CRUSHING VALUE APPARATUS.	1
32	SEDIMENTATION PIPPET FR SILT CONTENT	1
33	SET OF BEAKER	1
34	GRADUATED CYLINDERS SET	1
35	MEASURING CYLINDERS 100, 5OO 1000ML.	1
36	90 MICRON SIEVE.	4
37	GUAGING TROWEL	4
38	STOP WATCH	2
39	OVEN	1
40	METAL TRAYSET.	1
41	DRILLING MACHINE	1
42	SPRAY PAINTING MACHINE	1

43	PAINT REMOVER STOVE	1
44	LEE CHATTELIERS APPARATUS	1
45	STEEL BAR CUTTER	1
46	K SLUMP TASTER	1
47	BAR BENDING TABLE	1
SURVEYING TOOLS		
1	METRIC CHAINS	2
2	CROSS STAFF	2
3	CROSS STAFF (ALL TYPES)	4
4	PRISMATIC COMPASS	2
5	METALIC TAPES	4
6	RANGING ROD	6
7	ARROWS (CHAIN PINS)	24
8	PLUMB BOB	6
9	OPTICAL SQUARE	4
10	PRISMATIC COMPASS	2
11	PLANE TABLE	2
12	ALIDADE	2
13	DRAWING BOARD	2
14	DUMPY LEVEL	1
15	THEODOLITE	1
16	AUTO LEVEL	1

17	DIGITAL LEVEL	1
18	DISTOMAT (EDM)	1
19	DIGITAL THEODOLITE	1
2O	TOTAL STATION	1
21	ADVANCED SURVEING GPS	1
22	TAPES 30M	4
TOOLS AND EQUIPMENTS		
1	MASON' S TOOL KIT	4
2	BRICK LAYER'S TOOL KIT	4
3	TILER'S TOOL KIT	4
4	BAR BENDER'S TOOL KIT	4
5	PLUMBER'S TOOL KIT	4
6	CARPENTER'S TOOL KIT (FORM WORK)	4
7	PAINTERER'S TOOL KIT	4
8	MORTAR MIXING PAN	2
9	WATER SRAYER, SPADES , BUCKET, METAL, PLASTIC PANS (each)	1O
1O	SAFETY TOOL KIT	6
11	WHEEL BURROW 0F TYRE WHHELS	6
12	BATCH BOX	2
13	HELMETS	25
14	FIRST AID TOOL BOX /FIRST AID BOX	2
15	TUB FOR CURING	1
16	GUM SHOES. SET	10

FORM WORK MATERIAL		
1	TOTAL SET OF FORWORK FOR 50 SQ. M. (STELL PLATES, STEEL PROPS WITH ALL FITTINGS etc, PLYWOOD FOR SHUTTERING, WOODEN PLANKS, WOODEN PLANKS etc,)RCC SLAB,FOOTING , COLUMN , BEAM, ETC.	1 S E T
DRAWING TOOLS		
1	DRAWING BOARDS	25
2	TEE SQURE	25
3	MINI DRAFTERS	2
4	TECHERS GEOMETRY BOX	2
5	COMPUTERS	10
6	LAP TOP	2 Nos.
7	SET SQUARES SET	4
8	INSTUMENT BOX	4
9	DRAWING SHEET CASE	4
1O	PLOTTER	1
11	PRINTER	2
12	INVERTER	1
13	PEN DRIVES 8GB	2
14	BLANK CDS	2
AUTO CAD TOOLS		
1	AUTO CAD SOFTWARE WITH LIENSE	1
2	SOFTWARE FOR 3D	1
2	FURNITURE FO COMPUTER SETTING	LS

4	INTRIOR OF LABORATORY	LS
SPACE AVAILABILITY		
	SPACE REQUIREMENT	
1	DRAWING HALL FOR 2O STUDENTS---------- (6OO SQ. FT.)	1
2	DEMO LABORATORY---------- (400 SQ. FT.)	1
3	CONST. & SURVEYING LABORATORY ---------- (600 SQ. FT.)	1
4	STORE ---------- (600 SQ. FT.)	1
5	BUILDING YARD ---------- (2000 SQ. FT.)	1
6	MATRIAL STORAGE ---------- (600 SQ. FT.)	1

5. MECHANICAL TECHNOLOGY (K4, K5, K6)

Scheme of Examination

Std. – XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Basic Elements of Machine Shop	80	3	80	3	20	10	10	200
2	Basic Machine Shop Practice	80	3	80	3	20	10	10	200
3	Engineering Drawing and W/s Calcuation	80	3	80	3	20	10	10	200

I.V.: Industrial Visits
OJT: On the Job Training should be conducted in XI Std summer vacation

Std. – XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.	OJT	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Operations and Maint. Of M/C Tools -I	80	3	80	3	10	10	10	10	200
2	Operations and Maint. Of M/C Tools – II	80	3	80	3	10	10	10	10	200
3	Engineering Science and Utilities Machinery	80	3	80	3	10	10	10	10	200

I.V.: Industrial Visits
OJT: On the Job Training should be conducted in XII Std summer vacation

Introduction

Keeping in mind the need of Society which will be highly productive in present and future scenario the syllabus of mechanical technology enhance the self-employability vertical mobility in the course field, mechanical capability and even skilled based approach among the students who will get through the successful utilization of knowledge in future.

The new framing format of syllabus will facilitated the adequate scope for improvement in their skills regarding machine operation and maintenance. After the successful completion of syllabus, the student can develop the first hand experience of work which will be beneficial for the formation of the innovative technological world of this new advanced era. In introduction with computer based learning, this syllabus will change the perspective of mechanical technology and its implementation in various fields wherever the students enter with knowledge of it.

Job Opportunity

A) Self employment in the following field.

1. Fabrication.
2. Fitting & Welding
3. Plumbing.
4. Turning.
5. Machining.
6. CNC Lathe & CNC Milling.
7. Spare Parts.
8. Different Types of job work,

B) Employment as a work shop Charge men in:

1. Machine Shop.
2. Fitting/Assembly Shop.
3. Welding Shop.
4. Manufacturing Unit.
5. Machine Maintenance.
6. Job Inspection.
7. Sales Assistant.
8. Plumbing.

Employment in Government, Semi-Government or Private Sector up to lower management category.

C) Employment as skilled labour in:

1. Turning.

2. Fitting.
3. Welding.
4. Machining.
5. CNC Machining.

D) Further Education:

If student desires, he can take admission in first year of degree course, second year of diploma course of engineering or for further apprenticeship in the course field.

E) Teaching Scheme:

Theory: 120 periods (40 min) per paper (80 hrs).
Practical: 240 periods per paper (160 hrs)
On the job Training: 20 days x 04 hrs – 80 hrs minimum (on the job training should be conducted in Std. XI summer vacation).
Industrial Visits: Total 12 visits (During XI and XII Std.)

Objectives

To enable the student to:

1) Develop skill in fitting & bench work
2) Develop skill in job inspection with the help of precision measuring instruments & gauges.
3) Develop the skill in fabrication by providing the knowledge of welding.
4) Provide a sound working & operational knowledge of different machine tools like, Lathe Milling Machine, Shaping Machine, Power Hacksaw, Grinding Machine, CNC Lathe and Planning Machine.
5) Develop adequate knowledge of engineering drawing.
6) Provide adequate knowledge of maintenance machine.
7) Provide adequate knowledge of jigs and fixtures.
8) Knowledge of entrepreneurship activities.
9) Learn advanced machining operation and other related studies in the industries around by way of arranging technical study visits and arranging study lectures of personal from industries.
10) Developed proper knowledge of Carpentry tools and joints.
11) Develop skills in workmanship.
12) Provide basic knowledge of computers.
13) Provide adequate knowledge about machines and foundation.
14) Develop adequate knowledge planning and scheduling various machine operations.
15) Provide basic knowledge about electricity and internal combustion engine.
16) Develop skill as a plumber.
17) Develop confidence and entrepreneurship skill by arranging industrial visits.

Std. XI

Paper I: Basic Elements of Machine Shops (K4)

Theory

OBJECTIVES:

1) Gain knowledge about Metal and Non-Metals.
2) Gain knowledge about Measuring Instruments.
3) Develop measuring skills with the help of precision instruments.
4) To develop the skills in fitting work.
5) To develop the skill in welding specially in fabrication work.
6) Gain knowledge about Carpentry work.
7) Gain knowledge and skill about Plumbing work.
8) Develop skill in workmanship.
9) Change the outlook through industrial visit.
10) Gain knowledge about safety rules.

Sr. No.	Unit	Sub Unit	Periods
1.	Engineering Material	1.1 Introduction to Material 1.2 Metals 1.3 Non-Metals 1.4 Ferrous Metals 1.5 Non Ferrous Metals 1.6 Alloy Metals 1.7 Effect of Alloying on base metal 1.8 Steel Classification 1.9 Mechanical properties of Metals 1.10 Heat Treatment 1.11 Testing of Material	20
2.	Measuring Instruments	2.1 Introduction 2.2 Classification of Measuring Instruments 2.3 Study of Non-Precision Instruments 2.4 Study of Precision Instruments 2.5 Study of Comparator Instruments 2.6 Study of Angular Measuring Instruments 2.7 Introduction to Gauges 2.8 Classification of Gauges 2.9 Care and Maintenance of Measuring Instruments	20
3.	Fitting and Bench Work	3.1 Necessity of Bench work. 3.2 Hand tools used in fitting work 3.3 Marking tools used in fitting shop 3.4 Operations in fitting shop	20

		3.5 Interchangeability 3.6 SIZE, Actual Size, Nominal Size 3.7 Limit Fit and Tolerance 3.8 Allowance and Clearance 3.9 Surface roughness symbols	
4.	Welding	4.1 Introduction 4.2 Classification of Welding 4.3 Welding tools and equipments 4.4 Welding symbols 4.5 Soldering and Brazing 4.6 Pipe welding 4.7 Introduction to MIG, TIG welding 4.8 Defects and Remedies in welding 4.9 Safety in welding shop	20
5.	Plumbing	5.1 Introduction 5.2 Pipe Material 5.3 Plumbing Hand tools and equipments 5.4 Plumbing fittings joints 5.5 Care and maintenance of plumbing system	10
6.	Bearing	6.1 Introduction 6.2 Classification 6.3 Material of Manufacturing of Bearing 6.4 Bearing Mounting 6.5 Care and maintenance of bearings	10
7.	Carpentry and Moulding	7.1 Necessity 7.2 Types of Timber 7.3 Hand tools used in Carpentry 7.4 Types of Carpentry joints 7.5 Moulding Introduction 7.6 Moulding Classification 7.7 Moulding hand tools	10
8.	Safety Rules	8.1 Definition of Accident 8.2 Need of Safety 8.3 Safety Rules in work shop 8.4 Safety Equipments 8.5 Fire and Electrical Safety	10
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	Introduction to workshop, its layout & safety in shop.	06
2.	Study of Fire fighting equipments and their uses.	06
3.	Hardening, annealing & hardness testing – 1 Job	12
4.	Physical Introduction to outside & inside calipers for measuring o/s & I/S parameters.	04
5.	Physical Introduction to measuring instrument like a. Vernier Caliper b. Micrometer	08
6.	Least count of vernier caliper & micrometer. Exercise on the use of vernier caliper & micrometer.	10
7.	Filing a flat surface & check for flatness.	16
8.	Filing at right angle & check for right angle & straightness – 1 Job	16
9.	Filing a square – 1 Job	16
10.	Step Filing and form filing – 1 Job	16
11.	One job of fitting male & female – 1 Job	20
12.	Safety in welding shop, setting up the welding plant.	10
13.	Single 'v' Butt & Double "v" Butt joint by arc welding – 1 Job	20
14.	Soldering & Brazing – 1 Job	12
15.	Gas Welding – 1 Job	10
16.	Visit to local industries (minimum Two)	16
17.	Bearing mounting & Alignments	10
18.	Fillet joints on M.S. Flat by arc welding – 1 Job	08
19.	Study of different joint of plumbing and 1 Job on plumbing practice	08
20.	Study of carpentry joint.	16
	Total	**240**

Paper II: Basic Machine Shop (K5)
Theory

OBJECTIVES:

1) Gain knowledge about mechanical drives.
2) Develop skill in drilling
3) Develop skill in turning
4) Impart knowledge about Power Hack Saw
5) Impart knowledge about Computer
6) Develop knowledge about Manufacturing Process.

Sr. No.	Unit	Sub Unit	Periods
1.	Mechanical Drives	1.1 Introduction 1.2 Methods of drive 1.3 Elements of Power Transmission 1.4 Study of different types of drive 1.5 Study of brake system 1.6 Selection, care and maintenance of drives	20
2.	Drilling Machine	2.1 Introduction 2.2 Classification and specification 2.3 Study of different types of drilling machine 2.4 Tool holding and job holding devices used on drilling machine 2.5 Operations on drilling machine 2.6 Cutting speed, feed	20
3.	Lathe Machine	3.1 Introduction 3.2 Working Principle of Lathe machine 3.3 Types of Lathe machine 3.4 Size of Lathe machine 3.5 Main parts of Lathe machine 3.6 Lathe Accessories 3.7 Lathe Attachments 3.8 Lathe Operations 3.9 Types of Cutting tool 3.10 Cutting speed, feed and depth of cutting 3.11 Lubricants and Coolants	30
4.	Power Hack Saw	4.1 Introduction 4.2 Working Principle 4.3 Types of Hack Saw machine 4.4 Hack Saw blade 4.5 Specification of Hack saw machine 4.6 Care and maintenance of Hack saw machine	10

5.	Computer Application to work shop	5.1 Introduction 5.2 Fundamental to Computer 5.3 Hardware and Software of Computer 5.4 Antivirus of Computer 5.5 Introduction to NC and CNC Machine	20
6.	Manufacturing Process	6.1 Introduction 6.2 Classification 6.3 Study of different Manufacturing Process 6.4 Plant layout 6.5 Factory laws and rules.	20
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	Study of power transmission elements belt, pulley and gear. and chain.	08
2.	Study of construction of coupling and clutch with installation and maintenance.	08
3.	Facing – 1 Job	12
4.	Centering – 1 Job	12
5.	Plain Turning – 1 Job	12
6.	Grinding of cutting tools on pedestal grinder – 1 Job	12
7.	Step turning – 1 Job	16
8.	One composite job on lathe – 1 Job	24
9.	Taper turning – 1 Job	20
10.	Knurling & Chamfering – 1 Job	16

11.	Drilling & Tapping on drill machine – 1 Job	10
12.	Form Turning – 1 Job	18
13.	Grooving – 1 Job	08
14.	Study of block diagram of computer for Input & Output devices	08
15.	Study of existing plant layout	08
16.	Study of factory laws and rules	08
17.	Study of safety rules & equipments.	08
18.	Study of different types of tools & grinding of tool geometry (Drill & Lathe machine tools)	08
19.	Reaming operation on drill machine – 1 Job	08
20.	Local industrial visit (two)	16
	Total	**240**

Paper III: Engineering Drawing and Workshop Calculation (K6)

Theory

OBJECTIVES:

1) Impart knowledge about engineering drawing instruments.
2) Gain knowledge about geometrical construction
3) Develop skill in drawing orthographic and isometric view
4) Gain knowledge about development of surface
5) Gain knowledge about screw threads, fasteners and welding joints.
6) Develop the skill in machine drawing
7) Develop the skill in Auto CAD, 2D and 3D
8) Impart knowledge about engineering calculation.

Sr. No.	Unit	Sub Unit	Periods
1.	Engineering	1.1 Drawing Instruments 1.2 Lines and Lettering	10

	Drawing	1.3 Dimensioning Technique	
2.	Geometrical Construction	2.1 Simple geometrical construction 2.2 Engineering curves.	10
3.	Orthographic Projection	3.1 Method of Projection	15
4.	Isometric Projection	4.1 Isometric views	15
5.	Development of Surfaces	5.1 Development of Surfaces	15
6.	Screw threads, fasteners and welding joints	6.1 Types of thread 6.2 Forms of thread 6.3 Types of fasteners 6.4 Rivets and foundation bolts 6.5 Welding joints	15
7.	Auto CAD, 2D, 3D	7.1 Introduction of Auto CAD, window dialog box 7.2 Menu bars, Tool bars 7.3 Introduction to 2D 7.4 Draw commands, modify command 7.5 Dimension menu commands 7.6 Introduction to 3D, 3D modeling 7.7 Drawing environment paper space and mode space	20
8.	Engineering Calculations	8.1 Mensuration 8.2 Logarithm 8.3 Trigonometry 8.4 Introduction and calculations of measurement and conversion.	10
9.	Trigonometry	9.1 Trigonometry 9.2 Introduction and used of Trigonometry 9.3 Measurement of angles using Trigonometry 9.4 Calculation of height and distances using Trigonometry	10
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	Lines & Lettering	10
2.	Drawing conventions as per IS 696 – 1972	10
3.	Drawing instruments & their uses.	10
4.	Geometrical Constructions	16
5.	Orthographic Projection by first angle method	16
6.	Orthographic Projection by third angle method	16
7.	Isometric views	14
8.	Types of screw & threads	12
9.	Rivets & foundation bolt	14
10.	Free hand sketches of welding joints	12
11.	Development of Surfaces	16
12.	Introduction to Auto CAD	06
13.	Introduction of Auto CAD Window dialog box, bars, tool bars & command window	08
14.	Drawing & modifying CAD commands.	08
15.	Draw commands – Line, circle, Reactangle Ellipse & parabola.	08
16.	Make a block, write its instruction and then insert shape if required.	08
17.	Sketch 3D line on X, Y & Z planes	12
18.	Creating work axis & work points.	10
19.	Study of Trigonometry ratio for different angle.	10
20.	Industrial visit (Two)	16
21.	Study of calculation of standard shape, figures and volume.	08
	Total	**240**

Std. XII

Paper I: Operations and Maintenance of Machine Tools – I

(K4)

Theory

OBJECTIVES:

1) To develop the skill of students as TURNER.
2) To gain the knowledge about mass production lathe and CNC lathe
3) To develop efficiency and sound working, knowledge of different machine tools like lathe, shaper, slotter and press machine.
4) To gain knowledge about installation and alignment of machine tools.
5) To develop knowledge of preparing practical and geometrical test chart of machine tools.
6) To acquire definite vocational skills required for industries.

Sr. No.	Unit	Sub Unit	Periods
1.	Centre Lathe	1.1 Working principle of lathe machine 1.2 Block diagram and specifications 1.3 Special operations like drilling, boring, threading, taper turning. 1.4 Lathe cutting process i.e. oblique and orthogonal. 1.5 Care and maintenance of Lathe Machine 1.6 Cutting speed, feed, depth of cut and machining time.	20
2.	Capstan and Turret Lathe Machine	2.1 Introduction as a mass production Lathe 2.2 Comparison between centre lathe and Capstan and Turret Lathe 2.3 Classification of Machine 2.4 Difference between Capstan Lathe and Turret Lathe 2.5 Main parts of Capstan and Turret Lathe 2.6 Work holding devices 2.7 Tool holding devices 2.8 Capstan and Turret Lathe Tools 2.9 Capstan and Turret Lathe Operations 2.10 Turret tooling layout	20
3.	C.N.C Lathe Machine	3.1 Introduction 3.2 Classification 3.3 Specification 3.4 Advantages, limitation, application and future	20

		of C.N.C Technology 3.5 Study of CNC machine control unit (key and menus) 3.6 Study of CNC interpolation and co-ordinate system	
4.	Shaper Machine	4.1 Introduction 4.2 Working Principle 4.3 Classification 4.4 Specification 4.5 Principle Parts 4.6 Shaper Mechanism 4.7 Shaper Operations 4.8 Cutting speed, feed and depth of cut 4.9 Care and maintenance of Shaper	20
5.	Slotting Machine	5.1 Introduction 5.2 Working Principle 5.3 Classification 5.4 Specification 5.5 Principle Parts 5.6 Work holding devices 5.7 Slotter Operation 5.8 Cutting speed, feed and depth of cut	15
6.	Erecting and Testing of Machine tools	6.1 Introduction 6.2 Location and foundation 6.3 Erection 6.4 Testing, Practical, Geometric check 6.5 Test Chart	15
7.	Press and Press work	7.1 Introduction 7.2 Classification 7.3 Press Size 7.4 Press Tools 7.5 Methods of Punch Support 7.6 Methods of dies Support	10
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	Parallel cylindrical turning & boring to size – 1 Job	16

2.	Blind boring – 1 Job	14
3.	Internal thread cutting – 1 Job	14
4.	Taper turning by offset method – 1 Job	16
5.	Study of working of C.N.C machine	10
6.	Study of control System of C. N. C. Machine	10
7.	Preparation of cast iron blocks in different shapes on shaping machine – 1 Job	16
8.	Preparation of composite assembly involving operation on lathe machine, shaping & drilling machine.	22
9.	Inspection & overhauling of machine (Lather, shaper, drill machine & power hacksaw)	16
10.	Dismantling & Assembling lathe tailstock.	08
11.	Dismantling & Assembling lathe carriage.	08
12.	Study of slotted link crank mechanism of shaper machine.	16
13.	Slotting operation – 1 Job	16
14.	Make a test chart of lathe machine & shaper machine.	16
15.	Study of method of Punch and die support on press machine.	16
16.	Industrial Visit (any two)	26
	Total	**240**

Paper II: Operations and Maintenance of Machine Tools – II (K5)

Theory

OBJECTIVES:

1) To develop the student as a skill machinist.
2) To develop the student proficiency and sound working, operational knowledge of milling machine, grinder machine etc.
3) To gain knowledge about modern methods of machining.
4) To develop the skill in machine tool maintenance.
5) To gain knowledge of modern super finishing operations.

Sr. No.	Unit	Sub Unit	Periods
1.	Milling Machine	1.1 Introduction 1.2 Working Principle 1.3 Classification 1.4 Specification 1.5 Work holding devices 1.6 Cutter holding devices 1.7 Milling cutters 1.8 Milling operations 1.9 Indexing and dividing head 2.0 Indexing method 2.1 Spur gear milling operation 2.2 Cutting speed, feed and depth of cut 2.3 Care and maintenance of machine 2.4 Introduction to C.N.C Milling.	45
2.	Grinding Machine	2.1 Introduction 2.2 Classification 2.3 Specification 2.4 Grinding wheel 2.5 Abrasives 2.6 Bonds and bonding process 2.7 Grinding wheel balancing, dressing and truing. 2.8 Care and maintenance of machine	25
3.	Modern Methods of Machining	3.1 Introduction 3.2 Classification 3.3 Study according to Mechanical Energy (Ultrasonic Machining, Abrasive Jet Machining) 3.4 Study according to Chemical Energy (ECM, EGM) 3.5 Study according to Thermo Electrical Energy (IBM, PAM, EDM, EBM, LBM)	20
4.	Mechanical Preventive Maintenance	4.1 Necessity 4.2 Classification 4.3 Merits and demerits of brake down and preventive maintenance 4.4 Regular programming, inspection and	15

		record keeping of maintenance 4.5 Preparation of preventive maintenance chart 4.6 Preparation of history sheet of machine 4.7 Introduction to total productive maintenance (T.P.M)	
5.	Super Finishing Operations	5.1 Necessity 5.2 Merits and demerits of super finishing operation 5.3 Study of lapping, honing 5.4 Study of electroplating and anodizing	15
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	Preparation of different shapes from M.S. round bar a. Square – 1 Job b. Hexagonal – 1 Job	28
2.	Cutting key way on shaft – 1 Job	16
3.	Cutting spline on shaft – 1 Job	20
4.	Cutting spur gear on C.I. block (one gear for batch of four students)	20
5.	Cutting spiral groove on shaft – 1 Job	20
6.	Preparation of slots with steps on C.I. block (All operation on one job and one job for batch of four students)	20
7.	Surface grinding on M.S. plate on surface grinding machine – 1 Job	14
8.	Preparation of preventive maintenance programme for workshop machines.	14
9.	Dismantling & assembling of milling machine table.	14

10.	Dismantling & assembling of dividing head	14
11.	Study of modern methods of machining – Any one	14
12.	Study of super finishing operations – Any one	14
13.	Prepare a history sheet & general inspection chart for maintenance of milling machine.	16
14.	Industrial visit (any two)	16
	Total	**240**

Paper III: Engineering Science and Utilities Machinery (K6)

Theory

OBJECTIVES:

1) To gain knowledge about force, work, power energy and friction.
2) To gain adequate knowledge about lifting machines.
3) To develop skill in manufacturing jigs and fixtures.
4) To gain adequate knowledge about electric motors transformers and I. C. Engines.
5) To gain adequate knowledge about Hydraulic and Pneumatic System.
6) To gain basic knowledge about refrigeration.

Theory

Sr. No.	Unit	Sub Unit	Period
1.	Unit System	1.1 Introduction 1.2 Types of Unit 1.3 Unit Systems	5
2.	Force work, Power and Energy	2.1 Definition of force 2.2 Effect of force 2.3 Composition and Resolution of force 2.4 Definition of work, unit of work 2.5 Definition of power, unit of power 2.6 Engine power (I.H.P, F.H.P, B.H.P) 2.7 Definition of energy, unit of energy 2.8 Types of energy, total energy 2.9 Law of Conservation of energy	15

3.	Friction	3.1 Introduction 3.2 Types of friction 3.3 Laws of friction 3.4 Limiting frictional force 3.5 Co-efficient of friction 3.6 Angle of friction 3.7 Advantages and disadvantages of friction	10
4.	Simple Lifting Machine and conveyour system.	4.1 Introduction (definition of machine) 4.2 Types of machine 4.3 Some important terms of machine. M.A, V.R, efficiency, ideal machine etc 4.4 Relation between input and output of machine 4.5 Study of some simple lifting machine like simple axle and wheel, screw jack etc 4.6 Study of some simple conveyor system	15
5.	Jigs and Fixtures	5.1 Introduction 5.2 Necessity of jig and fixture 5.3 Classification of jig and fixture 5.4 Study of simple drilling jigs 5.5 Study of fixtures	10
6.	Internal Combustion Engine	6.1 Introduction 6.2 Difference between I.C engine and E.C. engine 6.3 Classification of I.C engine 6.4 Study of I.C engine main parts 6.5 Petrol and diesel cycle of combustion 6.6 Two stroke and four stroke engine 6.7 Cooling system of I.C. engine 6.8 Ignition system of petrol engine 6.9 Fuel supply system	15
7.	Electric Motor and Transformer	7.1 Introduction 7.2 Classification of motor 7.3 Motor connection 7.4 Care and maintenance of motor 7.5 Introduction to transformer 7.6 Classification of transformer	10
8.	Hydraulics	9.5 Introduction 9.6 Pump definition and classification 9.7 Study of Hydraulic shaper and Hydraulic jack 9.8 Study of different hydraulic valves 9.9 Advantages and disadvantages of hydraulic system	15

		9.10Care and maintenance of Pneumatic System	
9.	Pneumatics	9.1 Introduction 9.2 Aims and objectives of Compressed Air 9.3 Classification of Air Compressor 9.4 Study of Single Stage Air Compressor 9.5 Advantages and disadvantages of Pneumatic System 9.6 Care and maintenance of Pneumatic System	15
10.	Basic of Refrigeration	10.1 Introduction 10.2 Necessity of refrigeration 10.3 Methods of refrigeration 10.4 Unit of refrigeration 10.5 Refrigerating effect	10
Total			**120**

Practical

Sr. No.	Name of the Practicals	Periods
1.	To find out resultant force by resolution method a. Parallelogram law of forces b. Triangle law of forces	16
2.	To find out coefficient of friction between two surface a. Glass & wood b. Wood & wood	16
3.	To find out M.A, V.R & efficiency of following simple machines. a. Simple wheel & axle b. Simple screw jack c. Simple pulley block	24
4.	Preparation of simple model of jig and fixtures	16
5.	Study of Petrol Engine	16
6.	Study of Diesel Engine	16
7.	Study of Centrifugal Pump and its dismantling and assembling.	10
8.	Study of Hydraulic mechanism with schematic drawing.	10
9.	Study of Water hammer by schematic diagram.	10

10.	Study of Hydraulic jack by schematic diagram.	10
11.	Study of pneumatic system with schematic drawing.	10
12.	Study of Bore well Pump and its dismantling and assembling.	14
13.	Study of star-delta, startar connection with diagram.	12
14.	Study of Reciprocating Pump	12
15.	Study of single stage air compressor	10
16.	Preparing layout of electrical wiring of machinery.	12
17.	Study of Refrigeration method/cycle	10
18.	Industrial visit (any two)	16
	Total	**240**

List of Tools, Equipments, Machinery and Furnitures (For the batch of twenty students)

Sr. No.	Names with Specification of the tools, equipments, Machinery and Furnitures	Qty. for Instructor	Qty. for Trainees	Remarks
1	Steel Rule – 30 cm graduated both in metric and English	01	20	
2	Outside Spring Caliper – 150 mm	01	20	
3	Inside Spring Caliper – 150 mm	01	20	
4	Hermaphrodite Caliper – 150 mm	01	20	
5	Divider Spring – 150 mm	01	20	
6	Centre Punch – 100 mm	01	20	
7	Hammer Ball Pein – 0.5 kg	01	10	
8	Cross Pein Hammer 0.5 kg	01	10	
9	Cross Pein Hammer – 0.5 kg	01	10	

10	Combination Plier – 200 mm	01	10	
11	File Flat bastard – 300 mm	01	20	
12	File Flat 2nd cut – 250 mm	01	20	
13	Engineers Screw Driver	01	20	
14	File Flat smooth – 300 mm	01	20	
15	File Triangular 2nd cut – 250 mm	01	20	
16	File Round 2nd cut – 200 mm	01	10	
17	File Half Round 2nd cut – 200 mm	01	10	
18	File Triangular smooth – 200 mm	01	10	
19	File square 2nd cut – 200 mm	01	10	
20	File warding smooth – 150 mm	01	10	
21	File knife edge smooth – 150 mm	01	10	
22	Needle file set	01	02	
23	Cold Chisel – Flat 25 x 200 mm	01	10	
24	Cold Chisel cross cut	01	10	
25	Cold Chisel round hose	01	10	
26	Surface plate 500 x 500 Grade – 01	01	01	
27	Metal Stand table for Surface plate	01	01	
28	Screw driver set (Multi Head)	01	01	
29	Scribing block – Universal 300 mm	01	01	
30	Vee Block – Universal	01	05	
31	Try Square – 150 mm	01	20	
32	Straight Edge Steel – 500 mm	01	01	
33	Steel Tape – 05 meter	01	01	
34	Spirit Level	01	01	

35	Hammer Ball Pein – 800 gms with handle	01	01	
36	Screw Driver Heavy Duty – 300 mm with handle	01	10	
37	Hammer Lead 01 kg	-	01	
38	Allen key set inches	01	02	
39	Allen key set metric	01	02	
40	Spanner Set D.E.C.P Series	01	02	
41	Apollo Box Spanner Set / Ring spanner set	01	02	
42	Reduction Sleeve MT as required	-	01	
43	Angle Plate 150 x 100 x 150	01	01	
44	Solid Parallels in Pairs (Different sizes)	01	05	
45	Oil can pressure feed 500 mg	01	10	
46	Oil stone – 150 x 50 x 25	01	02	
47	Twist Drills – 03 mm to 13 mm (Parallel shank)	01	02	
48	Drill chuck – 0 – 20 with Taper shank	01	01	
49	Centre Drill – A – 01 to 05	-	02 Set	
50	Grinding Wheel Dresser (Star Type/Diamond type)	-	01	
51	C – clamps – 100 mm	-	02	
52	C – clamps – 200 mm	-	02	
53	Tap and Die Set in Box metric pitch	01	02	
54	Tap and Die Set in Box British pitch	01	02	
55	Die Set for pipe threads (up to 2”) with die stock	01	01	
56	Drill – HSS Taper shank (upto 20 mm)	01	01	
57	Reamer – 06 mm to 13 mm straight	01	01	

	shank			
58	Hack saw – Adjustable – 250 to 300 mm with blade	01	20	
59	Letter Punch – 3 mm Set	01	01	
60	Number Punch – 3 mm Set	01	01	
61	Magnifying Glass – 75 mm	01	02	
62	Hand Vice – 50 mm jaw	01	02	
63	Bench Vice – 150 mm	-	20	
64	Work bench of bench vice for fitting work	-	05	
65	Micrometer – outside – 0-25 mm	01	04	
66	Micrometer – outside – 25-50 mm	01	04	
67	Micrometer Depth Gauge – 0-150 mm	01	04	
68	Vernier Caliper 150 mm	01	04	
69	Digital Vernier Caliper – 0-150 mm	01	04	
70	Vernier Height Gauge 300 mm	01	04	
71	Vernier Bevel Protractor with L.C of 0.5	01	-	
72	Dial Gauge with Stand	01	04	
73	Screw Pitch gauge for metric and British pitch	01	01	
74	Radius Gauge – Metric Set (01 to 06 mm)	01	01	
75	Feeder Gauge (Metric) Set	01	01	
76	Plug gauges 5 to 25 mm	01 Set	-	
77	Ring gauges 5 to 25 mm	01 Set	-	
78	Pipe wrench 50 cm	01	02	
79	Pipe Bending Machine Manually Operated	-	01	

80	Pipe Vice	-	02	
81	Leg Vice	-	01	
82	Chain wrench	01	-	
83	Hand Gloves Pair and Aprons for students (Leather made)	-	04	
84	Welding Screen – Helmet type with plain and dark glasses.	01	10	
85	Welding Screen – Hand type with plain and dark glasses.	01	10	
86	Welding Goggles Pair	01	10	
87	Welding Scaling Hammer with handle	01	05	
88	Holding tongs – 30 cm	01	04	
89	Wire Brush – S. Steel	-	10	
90	Wire Brush – M. Steel	-	10	
91	Spark Lighter	-	04	
92	Chipping Screen – Hand	-	06	
93	Safety Boots for welders	-	10	
94	Weld Measuring Gauge Fillet and Butt	01	01	
95	Welding torch with 5 to 10 nozzles High Pressure and Low Pressure	01	02	
96	Welding torch tips (All assorted tips must fit into the torch)	01	06	
97	Cutting torch oxy-acetylene	01	02	
98	Electrode holder	01	02	
99	Welding rubber hose for oxygen and acetylene	As per requirement		
100	Cylinder Valve key	As per requirement		
101	Rubber Hose clips	As per requirement		

102	Pressure regulator – Oxygen for brazing	01	02	
103	Pressure regulator – Acetylene for brazing	01	02	
104	Pressure regulator – Oxygen for cutting	01	01	
105	Pressure regulator – Acetylene for cutting	01	01	
106	Tip Cleaner	01	02	
107	Welding Cable (To carry 350 amps)	As per requirement		
108	Lugs for cables	As per requirement		
109	Oxygen Cylinder	01	-	
110	Acetylene Cylinder	01	-	
111	Trolley for Cylinders	01	-	
112	Gas welding table	01	-	
113	Carpentry set of hand tools	-	02 Set	
114	Moulding set of hand tools	-	02 Set	
115	Inclined Plane with glass surface	-	02 Set	
116	Weighing box (1 to 500 gms) with pan.	-	02 Set	
117	Slotted weights with hook of 500 gm.	-	02 Set	
118	Laboratory model of Simple Wheel and Axle	-	02	
119	Laboratory model of Screw Jack	-	02	
120	Laboratory model of Simple Pulley Block	-	01	
121	Centrifugal Pump	-	01	
122	Reciprocating Pump	-	01	
123	Star Delta Starter	-	01	
124	Fire buckets with stand	-	02	
125	Safety Goggles	01	10	

126	Almirah	01	06	
127	Trainees Locker – Pigeon Holes – 10 Nos	-	02	
128	Fire Fighting Equipments, First Aid Box	01	01	
129	Storage Rack and Storage Self	As per requirement		
130	Table and Chair for Instructor	02 each		
131	Lathe general purpose S.S.S.C Cone Pulley type, motorized, 15 cm centre, height 1500 cm bed length with chuck and standard accessories	-	08	
132	Lathe general purpose S.S.S.C all geared head-stock types, motorized, 15 cm centre height, 1500 cm bed length with chuck and standard accessories and standard taper attachment	-	02	
133	Pedestal grinder – Double Ended with 170 mm wheels (one fine, one rough)	-	02	
134	Surface Grinding Machine – wheel dia 180 mm (approx) Reciprocating Table, Longitudinal Table Traverse 200 mm (approx) fitted with Adjustable Traverse stop Magnetic chuck – 250mm x 120mm with set of Grinding wheels, Diamond tool Holder for dressing and set of spanner etc	-	01	
135	Cylindrical Grinder with Internal Grinding attachment – Centre height – 130 mm with standard accessories	-	01	
136	Milling Machine – Universal with standard accessories, attachments and different size and shape milling cutters	-	02	
137	Shaper Machine up to 40 cm stroke length with standard accessories	-	01	
138	Slotter Machine with standard accessories	-	01	
139	CNC Trainer Lathe Machine with	-	01	

	Siemens Sinumerik 842 D/latest Version FANUC Oil/Latest Version CNC System, Servo Stabilizer and with necessary turning cutting tools and tooling packages, necessary accessories, Installation and Commissioning			
140	Drilling Machine – Pillar type 20 mm capacity with standard accessories	-	01	
141	Hand Drilling Machine (12mm) electric	-	02	
142	Power Hack Saw Machine (Hydraulic with all accessories)	-	01	
143	Disc Grinder (Hand grinder) – 100 mm	-	02	
144	Cutter off (Hand Shear electric)	-	01	
145	Anvil (Standard size)	-	01	
146	Transformer welding set with all accessories – 300 Amp	-	01	
147	Arc Welding Machine Set Rectifier type 400 Amp with all accessories	-	01	
148	TIG Welding Machine Set, 300 Amp AC/DC with water cooled torch and standard accessories	-	01	
149	Arc Welding Table all metal with positioner	As per requirement		
150	Desktop Computer with 4th Generation Core i5 Processor, 06 GB RAM with compatible Motherboard, Windows 8.1 Operating System, DVD Combo Drive, 1 TB HDD, 18" TFT/LED Monitor, 2 GB Graphics Card, 10/100/1000 Ethernet Card.	01	05	
151	Laser Printer / Lan Printer	01	01	
152	Wireless LCD Projector	01	-	
153	UPS	As per requirement		

154	Lan Switch 16 Port	As per requirement		
155	Drawing board half imperial size with 'T' – square	01	20	
156	Auto CAD Latest Version Software	01	05	
157	Computer table with chairs	As per requirement		
158	Black Board / White Board / smart board	As per requirement		
159	Adjustable Spanner	01	02	
160	Hydraulic Hand Press Machine with all occessories	-	01	
161	Single Stage Air Compressor	-	01	
162	Two Stroke I.C. Engine Model (Petrol and Diesel)	-	01 Each	
163	Four Stroke I.C. Engine Model (Petrol and Diesel)	-	01 Each	
164	Induction Furnace with temp. controller.	01	-	
165	Hardness Testing Machine	01	-	
166	Vacuum Cleaner	01	-	

List of Text Books and Reference Books
Std. XI & XII

Sr. No.	Title of Book	Author	Publisher
1	Elements of Workshop Technology Vol. I & II	S. K. Hajra Chaudhary	Media Promoters & Publishers Mumbai
2	Elements of Mechanical Engg.	S. K. Hajra Chaudhary	Media Promoters & Publishers Mumbai
3	Engineering Drawing	N. D. Bhatt	Charatar Book Stall, Anand

4	Geometrical & Machine Drawing	N. D. Bhatt	Charatar Book Stall, Anand
5	Workshop Technology	B. S. Raghuwanshi	Dhanpal Rai & Sons Delhi
6	Engineering Drawing I.S. Code -696-1972	-	-
7	Engineering Drawing	Wagholkar & Mandke	Nirali Prakashan Pune – 2
8	Elements of Mechanical Technology	Prof. P. V. Mandke	Nirali Prakashan Pune – 2
9	Hydraulics	Jagdishlal	-
10	Heat Engines Vol. I & II	Patel & Karamchandani	Acharya Book Depot
11	Basic Plumbing	Philbin	Prentice Hall
12	Teach Yourself Plumbing	Inness J. H.	The English Universal Press Trust
13	A Text Book Applied Mechanics	R. S. Khurmi	-
14	Applied Mechanics	Dhande / Jamdar	Anmol
15	Workshop Technology Vol. I & II	W. A. J. Chapman	Arnold
16	Blue Print Reading for Mechanical Trade	B. R. Sachdeva	McGraw Hill, Delhi
17	Shop Tools care & repair	De Witt Hunt	East West Pvt, Ltd., New Delhi
18	Theory of Machines	P. L. Ballaney	Khanna Publishers Delhi – 6
19	Automobile Engg. Vol. I & II	Kripal Singh	Lomas Offset Press, Delhi
20	Basic Electric Engineering	Prof. Prakash Shah	Arn Vidyutshala,

	Part 4		Publication, Pune
21	Elementary Engineering Drawing	Bhatt & Panchal	Charatar Publishing House, Anand
22	Working in Microsoft Office	Ron Mansfield	Tata McGraw Hill Co. Ltd., New Delhi
23	Manual of CNC	-	-
24	Computers Today	-	Galgotia Publication Pvt. Ltd., 5 Ansari Road, New Delhi
25	Auto CAD Manual	-	-
26	CAD CAM Manual	-	-
27	Auto CAD 2005 for engineers and designers	Prof. Shyam Tikon	Dream Tech.
28	Inside Auto CAD 2005	David J. Harrington	Tech. Media
29	Auto CAD 2013 for Dummies	Mark Middle Brork P. N. Rao	Wiley Publishing Inc. Wiley Dream Tech, India Pvt. Ltd.
30	CAD/CAM Principles & Application	-	Tata McGraw Hill Publication
31	CAD/CAM Computer aided design & manufacturing	Mikell P. Grover Emory W. Zimmer C.J.R	PHI Publication (Educational Economical Edition)
32	Mastery CAD/CAM	Ibrahim Zeid	Tata McGraw Hill Publication
33	Mastering Auto CAD 2015 & Auto CAD LT 2015	George Omura Brian Benton	-
34	Workshop Calculation	Shri. A. A. Baseshankar	Vijayshree Publication, Nagpur
35	Workshop Science	Shri. A. A. Baseshankar	Vijayshree Publication, Nagpur

36	Hydraulics, Fluid Mechanics and Hydraulics Mechanics	S. Chand (R. S. Khurmi)	
37	Material Science and Metallurgy	O. P. Khanna	Dhanpat Rai and Sons
38	Welding Technology	M. B. Dnadgavhal	Anmol
39	Engineering Science	V. P. Boery	
40	Refrigeration and Air Conditioner	Dhanpat Rai and Sons	
41	Industrial Engineering and Management	O. P. Khanna	Dhanpat Rai and Sons
42	Industrial Organisation and Engineering Economics	T. R. Banga S. C. Sharma	Khanna Publishers
43	Auto Engineering	R. B. Gupta	Surya Prakashan
44	Electrical Engineering	B. L. Thereja	
45	Basic Plumbing	Philbin	Prentice Hall
46	Teach Yourself plumbing	Inness J. H.	The English University Press Ltd.

List of Raw Materials
(For the batch of twenty students)

Consumable	Semi Consumable	Miscellaneous
1) M.S. Round Bar (Assorted Size) 2) M.S. Flat (Assorted Size) 3) M.S Angle (Assorted Size) 4) C.I. Block 50x50x50 5) Hack Saw Blades 6) Power Saw Blades 7) Lubricating Oil 8) Coolant (cutting) Oil	1) H.S.S. Tool bit 2) Carbide tools (Brazed tip assorted size and type) 3) Drill bits (Parallel and taper shank) 4) Centre/Combination Drill 5) Cleaning Brush (Machine cleaning) 6) Wire brush	1) Nut and bolts Assorted 2) Washers (Assorted) 3) Studs/Rivets (Assorted) 4) Belts/Ropes 5) Strings 6) Handles for files, hammers etc 7) Hooks

9) Gear Oil 10) Grease 11) Kerosene/Diesel/Petrol 12) Cotton waste 13) Emery Paper/Cloth 14) G.I/Plastic pipe and fittings 15) Hole tight 16) Teflon tape 17) Electrodes (Assorted) 18) Gas welding rods 19) Flux 20) Soap/Detergent Powder 21) Soldering Stick 22) Galvanized/M.S Sheet 23) Welding Gas (Oxygen-Acetylene) 24) Aluminum Rod for CNC Machine Job 25) Match Box/Gas Lighter 26) Welding Screen glasses plain & dark 27) First aid material	7) Bearing (Assorted size and type) 8) Electric fitting material 9) Milling cutters 10) Shaper tools 11) Slotter tools 12) CNC lathe tools	

6: COMPUTER TECHNOLOGY (X4, X5, X6)

Scheme of Examination

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)				
1	Office Automation	80	3	80	3	20	10	10	200
2	Desktop Publishing	80	3	80	3	20	10	10	200
3	Computer Hardware & Networking	80	3	80	3	20	10	10	200

* IV = Industrial Visits

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	I.V.*	OJT**	Total Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)					
1	Web Page Designing	80	3	80	3	10	10	10	10	200
2	Database System	80	3	80	3	10	10	10	10	200
3	Multimedia and Animation	80	3	80	3	10	10	10	10	200

* IV = Industrial Visits

** OJT = On Job Training

Introduction

Computer Technology covers almost every aspect of our daily lives from business to leisure. In this era of globalization it is necessary to have adequate skills in computer techniques.

The syllabus of Computer Technology has been evolved in such a way that after completion of the course of two years (Std. 11^{th} and 12^{th}), the student would acquire good working skills suited to work as an IT person.

He/she would also gain confidence to work as DTP operator, Hardware and Networking Technician and also Web Designer etc.

Objectives:

- To make the student computer literate.
- To make him/her familiar with Internet techniques.
- To make him/her aware about basic hardware aspects of computer, telecommunication and other devices.

- **Specific objectives:**
  Wage employment and self employment opportunities:
  1. Data Entry operator
  2. DTP operator
  3. Hardware & Networking Technician
  4. Assistance of Database Administrator
  5. Web Designer
  6. Animator

Std. XI
Paper I: Office Automation (X4)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	Introduction to Computer	1.1 Basic Anatomy: 1.1.1. Characteristics of Computer 1.1.2. Classification of Computer 1.1.3. Generation of Computer 1.1.4. Data Representation	03
2.	Operating System	2.1 Concept, Definition, Need 2.2 Overview of O.S 2.2.1. Feature of O.S 2.2.2. Types of O.S 2. 2.3. Windows XP 2.2.4. Windows 7 and 8 2.2.5. LINUX	07
3.	Advanced Office Suite	3.1 Word Processing 3.1.1. Creating Hyperlink Text 3.1.2. Inserting water mark 3.1.3. Importing files in other format 3.1.4. Creating symbolic shortcuts 3.1.5. Saving as a PDF 3.2 Spreadsheet 3.2.1. Get external data from webpage 3.2.2. Connect to (Import) external data from databases 3.2.3. Import Text (.txt or .csv) files 3.2.4. Creation Macros 3.2.5. Study of Pivot Table 3.3 Presentation 3.3.1. Combine shape tools 3.3.2. Use of picture crop 3.3.3. Save presentation as Video 3.3.4. Study of photo album	20
4.	Accounting Software	4.1. Introduction to Accounts 4.2. Advantages of computerized accounting 4.3. Introduction to Tally/Wings accounting/ Hisab/ Marg/ Gnucash/Busy and its features(**any one**) 4.4. Creation and configuration company menus	80

		related to Accounts 4.5. Creating, Displaying and Altering Groups 4.6. Creating, Displaying and Altering Ledgers 4.7. Voucher Entries 4.8. Displaying Trial Balance, Profit and Loss Account and Balance Sheet 4.9. Cost center	
5.	Internet	5.1. Internet Overview 5.1.1.WWW 5.1.2. Web server - Roll of Web Server and Client 5.1.3. Browsers - Internet Explorer, Mozilla Firefox 5.1.4. E-Mail 5.1.5. Messengers - Service and client and their features 5.2. Internet application 5.2.1. Reservation system 5.2.2. Online Banking 5.2.3. Online Shopping 5.2.4. Online Share trading	10
		Total	**120**

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	Introduction to Computer	1) Familiarization with Different operating system.	06
2.	Operating System	2) Study of installation any one operating system. 3) Study of control panel.	04 10
3.	Advance Office Suite	**Word Processing** 4) Create a Word document with link, Insert image with properties. 5) Create a word document with table & charts. 6) Demonstration of Hyperlink file, saving as PDF, Inserting water mark. 7) Demonstration on importing file in other format and creating symbolic shortcuts. **Excel /Spreadsheet** 8) Demonstration on macros. 9) Create an Excel workbook with two sheets using pivot table (using arithmetic or	25

		trigonometric or logical formula). 10) Demonstration on getting external data from web page. 11) Demonstration on import (.txt or .csv) files. **Power Point** 12) Creation of Power Point Presentation by using templates with custom slide transition effect and other special effects. 13) Demonstration on Hyperlink and various sound and animation effects. 14) Create a slide with text, image and animated effects and combine shape tools. 15) Demonstration on picture editing by using different effects (crop, brightness etc.). 16) Create a photo album on a specific topic with automised transition.	25 25
4.	Tally	4.1. Study of Tally Package (GATEWAY). 4.2. Creation of Company using Tally. 4.3. Study of Groups in Tally. 4.4. Creation of Ledgers using Tally. 4.5. Creation of vouchers for different trading organization. 4.5. Creation of vouchers for different non-trading organization. 4.6. Creation of cost center.	130
5.	Internet	5.1. Internet Overview 5.1.1 Search various websites 5.1.2. Study the different browsers 5.1.4. E-Mail to your friends 5.1.5. Chat with your friends through Messengers	15
		Total	**240**

Paper II: Desktop Publishing (X5)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	Desktop Publishing	1.1 Introduction 1.1.1. Paperback printing / publishing 1.1.2. Modern Printing 1.1.3. Desktop Publishing 1.1.4. Laser and Dot matrix Printer, Scanners	10

		1.2. Document Planning 1.2.1. Creating and Using thumbnail sketches 1.2.2. Setting Margins, establishing layout with grids, master pages, columns, typeface, type stiles, fonts, heading and sub-heads leading 1.3. Pre-Press designing and production techniques. 1.4. Book Binding techniques (for Printing Margin setup)	
2.	Adobe Indesign	2.1 Document Setup and Working Environment- Toolbox, Ruler Guides, Zooming and Scrolling, 2.2 Creating Frames, Moving Objects, Selection Techniques- Control and Transform Panels, Lines, Manually Resizing Objects, 2.3 Working with Text- Entering Editing and Importing Text, Highlighting and threading Text, Understanding Text Threads, Story Editor, Glyphs, Special Characters and White Space, Text Frame Options – Columns, Text Frame Insets & Vertical Alignment 2.4 Character Settings- Font, Size, Style, Leading, Kerning and Tracking, Horizontal and Vertical Scale, Baseline Shift and Slanted Text 2.5 Paragraph Settings- Indents, Space Before/Space After, Alignment, Drop Caps, Aligning to a Baseline Grid, Hyphenation, Keep Options and Breaks, Text Composers, Paragraph Rules, Bullet Points and Lists, Paragraph Styles, Character Styles , Applying and Editing Styles 2.6 Working with Images Indesign Placing an Image, Image Fitting Options, Scaling and Cropping Images 2.7 The Pages Panel- Inserting and Deleting Pages, Repositioning Document Pages, setting adding and deleting Master Pages, Auto page numbering 2.8 Working with tables- adding and deleting rows and columns. Resizing Columns and Rows, Entering Content 2.9 Exporting to PDF	20
3.	CorelDraw	3.1 Introduction to CorelDraw 3.2 Tools and menus 3.2.1. Use of various tools such as pick tools, zoom tools, freehand tool, square tool, Rectangle tool text tool, fill tool etc. and all fonts used in design in monograms, logos, posters, stickers, greeting cards, wedding cards, visiting cards. 3.2.2. Creating different types of drawings. 3.3. Basic drawing working with text-basic 3.4.Unit and Measurements (Pica, points, millimeters,	30

		centimeters etc) 3.5 Page Layout 3.6 Color schemes and matching 3.7. News Papers layout (global standards) 3.8 Printing.	
4.	Basic Photoshop	4.1Image Fundamentals: - 4.1.1 Digital image pixel. 4.1.2. Resolution. 4.1.3 DPL, 4.1.4 Raster image/bitmaps. 4.1.5 Vector image/graphics. 4.2. Various File Format:- 4.3.UnderstandingVarious Tools:- 4.3.1 Marquee- Rectangular/Elliptical. 4.3.2 Move Lasso, Polygonal Lasso, Magnetic Lasso, 4.3.3 Magic wand. 4.3.4 Brushes and other tools 4.3.5 Selection Techniques 4.3.5 Tools	35
5.	Advance Photoshop	5.1. Understanding various Palettes:- 5.1.1 Layers. 5.2. Character Text and Paragraph formatting 5.3. Status Bar and Option Bar. 5.4. Modes. 5.5. Image Display Options 5.6.. Edit Commands:- 5.6.1 Transform Preferences, Define Brush etc. 5.7. Image Commands Inverse.	25

		5.8. Image Processing, Layers and Filtering effects 5.9. View Commands. 5.10. Print Option.	
		Total	**120**

Note:

After completion of HSC vocational course (Computer Technology) most of the students do not continue their education they are interested in job or self employment so that they must know these professional softwares during the course.

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	Desktop Publishing	1. Study of various Book Binding Techniques	20
2.	Adobe Indesign	2. InDesign - use of tool box and creation of simple letterhead or identity card of your institute 3. InDesign – Design of a commercial color newspaper ad related to the exhibition of educational books in the size 2 columns x 10 cm. 4. Conversion of an Adobe InDesign Document into PDF (with and without Images)	40
3.	CorelDraw	5. Study of Units and Measurements in CorelDraw. 6. Study of Various tools used in CorelDraw 7. Page Layout and Design according to a sample newspaper in CorelDraw. 8. Graphic Import from different formats and Export to different formats in CorelDraw. 9. Text Wrap techniques around graphics.	65
4.	Basic Photoshop	10. Know the difference between Vector Graphics and Raster Graphics	65

		11. Screen Graphics and Pixel Graphics. 12. Understand the following formats :- .ai, .pdf, .eps, .svg, .svgz, .psd, .bmp, .gif, .jpg, .pcx, .pct, .png, .raw, .sct, .tga, .tiff, .vst. 13. Working with Images in Photoshop. Working with Palettes, i.e., layers palette, navigator palette, info palette, color palette, Swatches palette, Styles palette, History palette, Actions Palette, Tool preset palette, Channels Palette and Path Palette.	
5.	Advanced Photoshop	14. Working with Layers. Photo editing. Image adjustment options – Labels, Auto labels, Auto contrasts, Curves, Color balance, Brightness / Contrast, Posterize, Variations. 15. Working with the magic wand tool, lasso tool and Symbol Sprayer Tool. Edit the images using options of Warp Tool. Using Dodge tool, Burn tool, Sponge Tool and Clone Stamp Tool. 16. Creating images and giving special effects using Filters. 17. Using Layer Styles - Produce an image by mixing two or more different images using Layer Masking & Vector Masking.	50
		Total	**240**

Paper III: Computer Hardware and Networking (X6)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	Basic	1.1. Basic Electronic components 1.1.1. Significance of current, voltage, power,	10

	Electronic components and Devices	resistance and capacitors, diode, LED and transistors. 1.2. Input/ output Devices 1.2.1. Input Devices 1.2.2. Output Devices 1.3. Storage Devices: 1.3.1. Secondary Memory Installation and configurations 1.4. Introduction of cards: 1.4.1. Types of External Cards 1.4.2. Modem 1.5. Memory 1.5.1. Types of memories	
2.	Microprocessor Processors and Architecture	2.1. Types of processors. 2.1.1 Architecture of 8085 2.1.2. Introduction to 8086 2.1.3. SCSI interface, serial (COM)ports, parallel (LTP) ports 2.1.4. USB connector, keyboard and PS/2, connector, CD, DVD 2.2. Motherboard and its installation 2.3. Power supply and its installation	15
3.	PC Servicing and maintenance	3.1 Assembling and Dismantling of PC 3.2. Troubleshooting of various input, output and storage devices, 3.3. Software installation and virus protection 3.4 preventive maintenance 3.5. Types of backup, fine tuning the system.	25
4.	Networking and	4.1. Introduction to networking	65

	Communication	4.2. Types of network 4.3. Types of communication 4.4. Modes of communication 4.5. Network Component 4.6 Access Method 4.7. Network Architecture 4.8. Network Topology 4.9. Ethernet 4.10. Network Operating System 4.11. VPN and IPV6 4.12. Wired and Wireless Transmission Media 4.13. Threats & prevention from viruses, worms 4.14. Hacking 4.15. Proxy server 4.16. Types of Server 4.17. Network Protocol 4.18. Network Troubleshooting	
5.	Cyber Laws and Ethics	5.1. Moral, ethics & laws 5.2. Ethics culture & ethics for computer user computer professional , business 5.3. Code and guide lines of ethics. 5.4. Introduction to cyber laws 5.5. Intellectual property rights 5.6. IT act(amendment 2008)	05
		Total	**120**

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	Basic Electronic components and Devices	1. Identification (type, value, package, polarity) and testing of resistors, capacitors, diodes, transistors/ LED 2. Familiarization with different parts of Computer. 3. Installation of device drivers like printer, modem, scanner etc.	45
2.	Microprocessor Processors and Architecture	4. Assembling and Dismantling of Computer. 5. Formatting and Installation of different Operating Systems and other application software. 6. Fault finding and rectifying it.	35
3.	PC Servicing and maintenance	7. Preventive Maintenance of Computer System. 8. Setting up a NIC (Network Interface Card) and assigning IP address and subnet 9. Defining a Domain Model on Windows Servers.	60
4.	Networking and Communication	10. Setting up a Workgroup based network. 11. Setting up user level hierarchy with different security levels. 12. Sharing a Printer on the network for printing over the LAN. 13. Sharing different resources, files and folders with rights to specific users in a Domain Model. 14. Creation of various websites on a single Web Server and changing the Home Directory (WWW) of a IIS server.	100

		15. Configuration of a Proxy Server for Internet Connection Sharing with Restricted Access. 16. Configuration of a wireless network. 17. Installation of Antivirus Software 18. Creation of different users grant permissions to user. 19. Installing firewall security. 20. Installation of File server, Print server, Mail server etc. 21. Demonstrate the use of different Networking protocols 22. Demonstrate the process of network troubleshooting	
5.	Cyber Laws and Ethics	-	
		Total	**240**

Std. XII
Paper I: Web Page Designing (X4)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	HTML	1.1 Introduction of HTML 1.2 HTML Basic Tags and Attributes 1.3 Hyperlinks 1.4 Physical Style Tags 1.5 Images 1.6 Tables and Lists 1.7 Multimedia Objects	20
2.	Advanced HTML	2.1 Frames 2.2 Forms	30

		2.3 Image Mapping 2.4 Embedding Multimedia 2.5 Applets 2.6 Web Server 2.7 Browsers 2.8 CSS- Cascading Style Sheet	
3.	Macromedia Dreamweaver	3.1 Introduction to Dreamweaver 3.2 Exploring the basic interface 3.3 Formatting 3.4 Using Property Inspector 3.5 Using Object Panel 3.6 Working with Web Page files 3.7 Creating Hyperlink, Tables and frames	30
4.	Introduction to JavaScript	4.1 Limitation of plain HTML 4.2 Difference between Java and JavaScript 4.3 Variables and Operators 4.4 Selection and Iteration 4.5 HTML Program using JavaScript 4.6 JavaScript Programs	40
		Total	**120**

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	HTML	1. Study of HTML tags 2. Creating A simple Web page and saving the same 3. Use of various text formatting options Heading and paragraph with alignment 4. Physical style, font type, color and size,	80

		bold, itallic, underline, superscript and subscript 5. List ordered, unorderd and nested, paragraph indenting 6. Insertion of hyperlink and book mark, hyperlink properties 7. Image insertion formatting and image properties 8. Creation of tables with various border formatting 9. Page property setting title, background sound etc.	
2.	Advanced HTML	10. Header, footers, page no, selection break 11. Creation of HTML forms and related objects 12. Frames and working with frames 13. Design a web page using CSS 14. Use of buttons, labels, text box	60
3.	Macromedia Dreamweaver	15. Study of Dreamweaver environment 16. Creating a simple website using text, graphics, sound	40
4.	Introduction to JavaScript	17. Use of control structures 18. Write a program to display message on the screen using JAVA script 19. Mathematical calculation using JAVA 20. Program using control structure and looping structure	60
		Total	**240**

Paper II: Database System (X5)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	Database Concepts	1.1 Introduction to database 1.2 Database Components 1.3 Differences between database and spreadsheet 1.4 Database Management System	20
2.	Introduction to RDBMS	2.1 Introduction of DBMS and RDBMS	35

		2.2 Shortcoming 2.3 Benefits of Database 2.4 The Database Management System 2.5 The Database Administrator 2.6 Database Users	
3.	Introduction to MS-ACCESS	3.1 Introduction 3.2 Database Terminologies 3.3 Data Types in Ms-Access 3.4 Rules for Field Name 3.5 Creating a simple database 3.6 Viewing and Editing Data 3.7 Relationships 3.8 Utilities in Access 3.9 Querying Database 3.10 Report in Access	35
4.	Database in Network Environment	4.1 Operating system 4.2 Client Server application 4.3 ODBC DSN 4.4 Introduction to SQL	30
		Total	**120**

Note:

After completion of HSC vocational course (Computer Technology) most of the students do not continue their education they are interested in job or self employment. So that they must know these professional software during the course.

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	Database concept	1. Create a database to store records of students performance in std. XI	60

		2. Create an appropriate form to fill data into a database in practical 1 3. Write an appropriate query to display records of database in practical 1 in various order	
2.	Introduction to RDBMS	4. Copy one table form a database to another database with/ without data	40
3.	Introduction to MS-Access	5. Import different file of different formats into an Access database 6. Export an Access database to different files of different format 7. Create a multiplex database with tables representing carrier records of cricketers. Use relationship to access identity in both tables (Separate tables for batting, bowling, fielding) 8. Study of compact feature on a sample database and comparison with the original 9. Application of password and encryption to a database	80
4.	Database in Network Environment	10. Create and ODBC DSN for Access database to use the same over a network	60
		Total	**240**

Paper III: Multimedia and Animation (X6)
Theory

Sr. No.	Unit	Sub Unit	Periods
1.	Multimedia Objects	1.1 Image Formats 1.2 Audio formats 1.3 Video Formats	10
2.	Presentation Techniques	2.1 Creation of presentation 2.2 Animation for presentation 2.3 Animation techniques.	10
3.	Macromedia FLASH	3.1 Introduction 3.2 Basic functions 3.3 Creating objects	30

		3.4 Editing objects 3.5 Frames and layers 3.6 Bitmaps and sound 3.7 Animation	
4.	Macromedia Director	4 .1 Introduction 4.2 Cast 4.3 Working with Cast 4.4 Files and their types 4.5 Shortcuts, menus and toolbar 4.6 Director scripting 4.7 Working with message 4.8 Stage and score 4.9 Scripts 4.10 Creating interactivity 4.11 Editing media 4.12 Creating movies	30
5.	2D & 3D animation	5.1 Definition 5. 2 Basic Animation 5.3 Introduction 5.4 Drawing 5.5 Coloring 5.6 Color schemes 5.7 Texturing	40
		Total	**120**

Practical

Sr. No.	Unit	Sub Unit	Periods
1.	Multimedia Objects	1. Demonstration of Image, Audio, Video formats 2. Conversion of Image, Audio, Video format	10
2.	Presentation Techniques	3. Presentation with sound effect 4. Presentation with video clips 5. Study of selection of appropriate format of a file (Graphics, sound, animation for web application) 6. Simple project on multimedia presentation	20
3.	Macromedia Flash	7. Study of layers in flash 8. Study of time line in flash 9. Study of transition / background in flash 10. Simple presentation using flash 11. Study of Flash plug-ins	60
4.	Macromedia Director	12. Study of Director Environment 13. Study of cast and a score 14. Design a web page embedding Audio and Video effect	60
5.	2D &3D animation	15. Demonstration of various basic tools used in 2D &3D animation 16. Drawing lines, 2D &3D shapes, object drawing, cartoon drawing 17. Simple animation with GIF animator 18. Coloring - color wheel, primary, secondary and tertiary colors 19. Texturing – visual and feel textures 20. Creation of movie clip as a mini project	90
		Total	**240**

REFERENCE BOOKS

Book Name	Author	Publisher
Fundamentals of Microprocessors and Micro Computers	B. RAM	Dhanpat Rai Publications
Microprocessor Architecture, Programming and Applications with	Ramesh S. Gaonkar	Penram International

the 8085		Publishing
Networking	Steve Rackley	DreamTech Press
Networking A Beginners guide	Bruce A. Hallberg	Tata McGraw Hill Edition
Operating Systems	J. Archer Harris	Schaum's Outlines
Internet an Introduction	Manish Dixit	Tata McGraw Hill Series
Multimedia Technology and Applications	David Hillman Ashok Banerji Anand Mohan Ghosh	Galgotia Publications Tata McGraw Hill
Multimedia Making it Work	Tay Vaughan	Tata McGraw Hill
Web Publishing	Monica D 'souza Jude D'souza	Tata McGraw Hill Publishing company Ltd
Web Page Design	Brian Austin	DreamTech Press
Working in Microsoft Office	Ron Mansfield	C-DAC-Tata McGraw Hill series
CorelDraw in easy steps	Stepen Copestake	DreamTech Press
CorelDraw in Simple steps	Kogent Solutions Inc.	DreamTech Press
Photoshop [for Windows and Mac] in easy steps	Robert Shufflebotham	DreamTech Press
Dreamweaver	Nick Vandome	DreamTech Press
Flash	Nick Vandome	DreamTech Press
Data Structures	Seymour Lipschutz	Schaum's Outlines Series
Concepts of Database Management	Philip J. Pratt Joseph J. Adamski	Vikas Publishing House
Tally 9	A.K.Nadhani,	BPB Publishing

	K.K.Nadhani	Company
Tally 9 in simple steps	Kogent Solutions INC	DreamTech
JavaScript in 24 hours	Michael Moncur	Techmedia

List of Tools and Equipments for XI and XII

1. Space Requirement - Classroom 400 sq.ft. (01 No.)

Computer Lab 800 sq.ft. (01 No.)

2. Power Supply -3 Phase 5 K.W.

4. **List of Tools and Equipment- (for a batch of 30 students)**
   i. Online UPS for computer lab.
   ii. Server for networking with latest configuration-01 No.
   iii. Workstations / nodes with latest configuration and multimedia facilities.-30 No.
   iv. Laptop- 02 no.
   v. Inkjet and Laser Printer: - 01 each
   vi. Scanner – 01
   vii. Speakers, Head Phone, Web Camera -02 each
   viii. Old computers for assembling and dissembling.
   ix. Consumables for hardware and networking -as required.
   x. Furniture - Vacuum cleaner, Computer tables and chairs, cupboard.

5. **Software** -Essential open source software as per the syllabus.

COMMERCE GROUP

1. ACCOUNTING AND OFFICE MANAGEMENT (Y7, Y8, Y9)

SCHEME OF EXAMINATION

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	Oral	Total Marks	Average Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)						
1	OFFICE MANAGEMENT AND ORGANIZATION	80	3	80	3	10	10	10	10	200	100
2	FUNDAMENTAL OF ACCOUNTING	80	3	80	3	10	10	10	10	200	100
3	FUNDAMENTAL OF COSTING AND AUDITING	80	3	80	3	10	10	10	10	200	100

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	OJT	Total Marks	Average Marks
		Marks	Time (Hrs)	Marks	Time (Hrs)						
1	OFFICE MOTIVATION	80	3	80	3	10	10	10	10	200	100
2	ADVANCED FINANCIAL ACCOUNTING	80	3	80	3	10	10	10	10	200	100
3	ADVANCED COSTING AND AUDITING	80	3	80	3	10	10	10	10	200	100

*OJT: ON THE JOB TRAINING

Introduction

Accounting and office Management is gaining quite extensive recognition, both within and outside the business world. It has rightly been termed as the language of business. The basic function of any language is to serve as a means of communication. Accounting too serves this function. It communicates the results of business operations to various parties who have some stake in the business, viz. the proprietors, creditors, investors, government and other agencies. The need for accounting is of great importance for a person who is running a business. He must know: (i) What he owns (ii) Whether he has earned a profit or suffered a loss on account of running a business, (iii) what is his financial position i.e. whether he would be in a position to meet all of his commitments in the near future or he would be in the process of becoming bankrupt.

Cost Accounting also plays predominant role in manufacturing and trading concerns. Knowledge and skill of cost accounting only can gain success to any business, as any business, as cost control is the best tool of maximizing profit. Cost cutting is vital for survival and success in globalization.

Audit has become indispensible for any kind of business. It is through audit that one can hear the sound of reliability of commercial concerns. The success and prosperity of business depends upon the efficiency of the audit system. It is an important tool of management control. Audits are essential in order to examine the truth & transparency of the financial position and account record kept by businessmen.

Management skills are also essential for every entrepreneur to get work done through the efforts of other for meeting the needs of wide range business activities.

This is an era of globalization. In this globalised word, the infrastructure of business and commerce activities keeps expanding every day as we know, the smooth functioning of any establishment of organization depends upon efficient office and personnel support. All types of corporation, organization, establishments, institutions, enterprises working in government & non government sectors need skilled personnel.

In response to these complexities & as a knowledge domain, Accounting, Cost Accounting, Auditing & Office Management, is gaining wide popularity. It finds a place in the vocational stream at the higher secondary level. A person, trained under 'Accounting and office Management' course, can get a job as an accounts clerk/ accounts assistant, billing clerk. Cashier, ledger clerk, cost assistant, etc. So far as self-employment is concerned, a person can undertake accounting jobs independently. Therefore, for meeting the future manpower requirements in various enterprises, the vocational course 'Accounting and Office Management' is designed and introduction at the +2 stage by various States / UTs in India. Among other things the above vocational course is designed to generate adequate competency in students facilitating their entry into word of accounting.

Objectives of the Course:

1. To develop knowledge and understanding of-
   - Concepts, principles, practices and procedures of accounting and auditing.
   - Various books, records, documents and vouchers which are basic one for accounting activity.
   - Returns and statements prepared by the accounts department from time to time
   - Negotiable instrument and banking practices relevant for maintaining books of accounts.
   - Costing principles and techniques.
   - Auditing principles and procedures.
   - Working and use of computers in accounting.

2. To enable students to attain proficiency in-
   - Writing books of accounts in both ways manually as well as computerized such as cash books, other day books Journal, ledger etc.
   - Preparing trial balance, final accounts, reconciliation statements and filling income tax / sales tax return forms and statements.
   - Preparing cost sheets, finding out contract costs, marginal costs, standard & actual costs, variance analysis, reconciliation of cost & financial profit etc.
   - Carrying out auditing work such as detection of errors and frauds, preparation of audit programme and maintenance of audit note books.
   - Working papers and other record, evaluation of internal control system verification and vouching.
   - Preparing book of accounts bills, vouchers, cost statements etc. using a computer.

3. To inculcate personality traits like accuracy, efficiency, neatness, promptness, judgment and commonsense, analytical ability, courtesy, economy, sincerity, honesty, consistency, passion, alertness.

4. To enable students to appreciate that the accounting structure is based on some definite principles which have general applicability.

5. Develop interest in modern practices of office accounting.

   - Acquire basic knowledge and skills about computer operations.
   - Develop competent office personal for wage & self employments.

Job Opportunities

A) Wage Employment (Manual and Computer Based)

1. Accounts Clerk, Accounts Assistant
2. Billing Clerk
3. Cashier / Cash clerk
4. Ledger Clerk
5. Cost Clerk, Cost Assistant
6. Audit Clerk, Audit Assistant
7. Office Clerk / Office Assistant
8. Office Secretary
9. Office Clerk cum Cashier
10. Store Keeper
11. Personal Assistant
12. Computer Operator
13. Receptionist

B) **Self Employments (Manual / Computer Based):**

After completion of this course and completion of one year apprenticeship training, candidates should be licensed as. "Certified Book Keeper" if they have successfully completed one month advanced tally course & MS-CIT course, which would enable him to practice book keeping work independently & can undertake accounting jobs independently as mentioned in wage-employment and setting up of office service institute, computer service institute setting up of office accounting bureau.

Std. XI
Paper I: Office Management and Organization (Y7)
Theory

Periods

Topic No. 1: Concept of Office Management. 15

1) Meaning and definition of office
2) Importance of office
3) Functions of Modern office
4) Sections and function of office departments.
5) Meanings and definitions of Management
6) Functions of management
7) Meaning and definitions of office management

8) Approach of office management
   i) Conventional office Management
   ii) Artistic office management
   iii) Scientific office management
9) Principles of office management
10) Functions of office management

Topic No. 2: Office Organizing 14

1) Meaning and definition of office organization.
2) Importance of office organization
3) Principles of office organization
4) Types of office organization
5) Meaning and definition of Delegation of Authority, Responsibility
6) Importance, features and factors of delegation of authority and responsibility.
7) Principles of Delegation of Authority and responsibility.
8) Problems in Delegation of Authority and responsibility.
9) Job specialization, Job analysis and Job description.
10) Meaning and Importance of organizational Relationship.
11) Meaning of Span of Authority.
12) Informal Organization.
13) Conflict in Organization.
14) Causes of organizational change.

Topic No. 3: Office Communication 13

1) Meaning and definition of Communication
2) Importance of Communication
3) Features of Communication
4) Elements of Communication
5) Scope of Communication
6) Types and Media of communication.
7) Principles of communication.
8) Barriers in communication
9) Meaning, definition and principles of coordination.
10) Relation between coordination and communication.

Topic No. 4: Office Manuals 13

1) Meaning and definition of office Manuals
2) Purpose of office manual
3) Importance of office Manual
4) Types of Office Manual
5) Manual in use
6) Contents of Office manuals
7) Sources of Manual materials
8) Procedure of preparation of Office manual
9) Distribution revision and maintenance of office manuals.

10) Evaluation of Office manuals
11) Advantages and Disadvantages of office manuals.

Topic No. 5: Office Correspondence & Letter Writing 15

1) Meaning, Definitions of office correspondence
2) Importance of office correspondence
3) Procedure of inward and outward correspondence
4) Modes of Correspondence
   i. By Hand
   ii. By Post – ordinary post, book – post, under posting certificate
   iii. Registered and unregistered letter, parcel, registered acknowledgement due, speed post etc.
5) Meaning and definition of letter
6) Types of letters – Personal, official, semi-official, confidential, Business.
7) Characteristics of Ideal Letter – Complete, Clear, Correct, concise convincing, considerate, concrete, courteous, coherence, language of letter.
8) Structure of official letter.
9) Contents of official letter.

Topic No. 6: Office Automation & Machines 15

1) Meaning and definition of office automation.
2) New technology used in office automation.
3) Need and feasibility of office automation
4) Advantages and disadvantages of office automation.
5) Social Aspects of office automation.
6) Importance of Office appliances & Machine.
7) Principles of selecting office appliances and Machine.
8) Office machines used in different offices, Franking cheque writing, machine, addressing machine, electronic typewriting, Xerox, Fax, Calculator, Computer.

Topic No. 7: Selection Recruitment and Training of office employees 15

1) Meaning & Concept of selection & recruitment
2) Sources of recruitment
3) Needs of recruitment
4) Procedure of recruitment & selection.
5) Meaning & Principles of training
6) Methods of employee's training
7) Placement & induction

Topic No. 8: Microsoft office & its Applications. 20

1) Meaning, definition & types of computer
2) Features of Computer
3) Classification of computer
   By Nature & Types
   By size & Capacity

By use & purpose

4) Primary memory & Secondary memory
5) Input and output Devices
6) Merit and Demerit of computer.
7) MS – Word, Excel, PowerPoint.
   Meaning, Applications Features Merit and Demerit
8) Introduction of Internet
9) Email- Creating receiving & sending Email.

Practical

Periods

Topic No. 1: Concepts of Office Management 30

1) Showing films and slides on modern setup of office by using overhead projector television etc.
2) Demonstration in a class room by putting desk, tables, seating arrangements like office setup where emphasis should be given lighting, ventilations feasibility of movement and inter-related work seats.
3) Visits to various office i.e. Bank, LIC etc.
4) Preparation of chart showing various sections and their functions of modern office.
5) Visits to modern offices for showing various section and their functions.
6) Preparation of various registers required for office.
7) Visit to modern office for studying various registers maintained by them.
8) Preparation of charts showing scope of management.
9) Visit to modern establishment for study the functions of management.
10) Visits to modern office to acquaint the students with principles and functions of office management.

Topic No. 2: Office Organizing 28

(Minimum 05 Practicals on)

1) Preparing type wise office organization charts.
2) Preparing departmental organization charts (for particulars department)
3) Visit to business concern for studying the structure of office organization.
4) Writing of letter indicating the problem in delegation of authority to higher Authority.
5) Preparing Questionnaire used for Job Analysis.
6) Preparing of Job description chart.

Topic No. 3: Office Communication 26

1) Preparation of maintenance of registers used in office automation
2) Telephone register
3) Visitor slip & register

4) Appointment diary
5) Planning diary
6) Complaints slip and register
7) Worksheet register
8) To acquaint the student with how to read telephone directory.
9) To acquaint the student with the procedure and application of modern medias of communication with special reference to telephone, Fax, E-mail etc.
10) Visit to a telephone exchange office to study the medias and system of communication.

Topic No. 4: Office Manuals 26

1) Prepare a manual of HSC vocational department
2) To acquaint the students with the procedure of preparation of manual.
3) To acquaint the students with the procedure of distribution revision and maintenance of manuals.
4) Visit to an industrial office of acquaint the students with the types of office manuals.

Topic No. 5: Office Correspondence and Letter Writing 30

1) Maintenance of Inward and outward mail register.
2) Visit to an office to study the Inward and Outward mail procedure.
3) Students are expected to know the different method of correspondence
4) Prepare a layout of business letter.
5) Prepare a draft of confidential letters.
6) Prepare a draft of demi official letter
7) Prepare a draft of personal letter.
8) Draft letters to different Institutions for different Purposes, e.g. To Insurance Company, to bank, to HSC Board etc

Topic No. 6: Office Automation & Machine 30

1) Visits to modern office to study the office automation and its aspects.
2) Visit to a modern office to study the new technology used in one office automation.
3) To demonstrate the students with the various types of office machine used in the modern office i.e. Franking machine, Cheque writing machine, Xerox, Computer, Fax etc.

Topic No. 7: Selection, Recruitment and Training of Office Employees 30

1) Prepare an advertisement in state and local level news paper for the post of General Manager, OS and Accountant etc. with Qualification experience etc.
2) Prepare a proforma of Resume / Curriculum Vita.
3) Prepare a call letter for Interview to Concern Candidate.
4) Prepare proforma of appointment letter.
5) Prepare proforma of joining letter.
6) Prepare Layout of Training Institute.
7) Prepare plan of Training Programme.

8) Visit to Employment Exchange.

Topic No. 8: Microsoft Office & Its Application **40**

1) To introduce the computer operating system to students practically.
2) Create Documents in MS Word.
3) Create table with Rows & Columns for Salary Sheet, Mark Sheet etc.
4) Prepare Slides for Presentation with regard to different project.

Paper II: Fundamentals of Accounting (Y8)
Theory

Periods

Topic No. 1: Introduction of Book-keeping and Accountancy **10**

1) Contents: - Meaning, Objectives, Importance and Utility, Difference between Book Keeping and Accountancy.
2) Basic Accounting Terminologies:-
   Business Transaction – Business and non business, Monetary and Non Monetary, Cash and Credit, barter transactions, Capital, Drawing, Assets, Liabilities, Income, Expenditure, Profit, Loss, Debtor, Creditor, Solvent, Insolvent, Goods, Purchases, Sales, Stock-Opening and closing, Bad-debts, Discount, Commission, Goodwill, Types of Assets, Types of Liabilities, Capital Expenditure, Revenue Expenditure, Capital Receipt, Revenue Receipt, Deferred revenue expenditure, Entry, Narration, Account, Types of organizations, meaning and definition only (Sole Trader, partnership, private company, Joint stock Company, Co-operative society).
3) Accounting Concepts & Conventions.
4) Accounting Standards.

Topic No. 2: Book-Keeping Systems **10**

1) Single entry & Double entry Book-Keeping system, Principles of Double entry book keeping system – meaning, importance and advantages of double entry book-keeping system.
2) Classification of accounts – Personal, impersonal (Personal, Real, Nominal) Rules of Debit & Credit for each types of account, relationship between book-keeping and accounting.

Topic No. 3: Journalising of Business Transactions and Ledger **20**

1) Introduction, Meaning & Definition of journal, Format of Journal, Journal entries simple and compound with narration.
2) Meaning & Utility of Ledger, Ledger posting, Balancing of Ledger accounts, Preparation of Trial Balance.

Topic No. 4: Subsidiary Books 20

1) Meaning, Need and advantages of subsidiary books, types of subsidiary books/journal, purchase book, sales book, purchase return, Bills receivable book, Bills payable book, sales return book, journal proper, posting & entries in subsidiary book to ledger.
2) Cash Book –
    a) Simple cash book, double column cash book (cash book with cash & Bank column).
    b) Petty cash book – simple petty cash book, analytical petty cash book with imprest system.

Topic No. 5: Banking Transactions 05

1) Banking transaction and their recording, Bank – meaning, functions of bank, types of Bank Account, Current, Saving, Recurring Deposit & Fixed Deposit Account, pass book, pay in slip, withdrawal slip, statement of account, opening of bank account and their operations, Types of cheques, ATM and NET Banking systems.

Topic No. 6: Bank Reconciliation Statement 15

1) Meaning and Need for preparation of bank reconciliation statement, Reasons of disagreement in bank balance as per cash book & pass book, procedure of preparation of Bank Reconciliation statement from given discrepancies & extracts of cash book and pass book.

Topic No. 7: Trial Balance and Rectification of Errors 10

1) Meaning, Need and Method of preparation of trial balance, Gross Trial balance, Net trial balance, kinds of errors their effects on trial balance, rectification of errors, rectifying entries, suspense account.

Topic No. 8: Final Accounts of Sole Trader 20

1) Preparation of Manufacturing, Trading account, profit & Loss account and balance sheet.
2) Adjustment: - Closing stock, unpaid and prepaid expenses, outstanding / accrued income, Income received in advance, Depreciation, Transfer to reserve, drawings, Loss of goods.

Topic No. 9: Accounting with Tally Package 10

1) Creation of company, new accounts, groups, types of vouchers, classification of data entry. Cash, receipts, journal vouchers and contra entries. Preparation of cash books, purchase register, sales registers, return registers, journal proper, various ledger accounts, Trial balance, Manufacturing, Trading, Profit & Loss Account & Balance sheet.

Practical

Periods

Topic No. 1: Introduction of Book keeping and Accountancy & Source Documents **20**

1) Every student must maintain a journal or practical file with him. This should be timely examined and signed by the teacher and Instructor
2) Printed specimen formats should be used for practical work such as cash memo etc.
3) Source documents: Cash memo, Credit memo, Receipts, Bills, Simple Vouchers, Petty Cash Voucher, Journal Vouchers, Debit Note, Credit Note, Cheque, Pay-in-slip, Withdrawal slip, Pass Book.
4) Application form, Demand Draft, Advices, FDR Export – Import document – Commercial Invoice, Letter of Credit, Bill of Lading, Transport Receipt, Dock warrant etc.
5) Minimum 05 Practicals should be conducted to identify source document and 5 Practicals should be conducted to fill the printed source documents by giving necessary transactions.

Topic No. 2: Book Keeping Systems **10**

1) Classification of Account – 10 Practicals should be conducted on classification of accounts, which should contain at least 30 head of accounts for every practicals.
2) Analysis of transaction: - 10 Practicals of 20 transactions each.

Topic No. 3: Journalizing of Business Transactions & Ledger **40**

1) Practical Problems on Journal Entries, Ledger Posting and Trial Balance.
2) 10 Practicals of 20 transactions each with opening balance.
3) 5 Practicals of 10 actual source documents should be conduct.
   (Printed forms of Journal & Ledger to be provide)

Topic No. 4: Subsidiary Books **40**

1) Subsidiary Books; Ledger Posting and Trial Balance:-
2) 10 Practicals of 20 transactions each, out of these two practicals should be based on genuine source documents.
3) Minimum 10 practical problems of 15 transactions each on columnar cash book and 5 Practicals Problem on petty cash book each, out of which 3 should be on imprest system.

Topic No. 5: Banking Transactions **10**

1) Minimum 10 practical problems of 15 transactions each on Journal entries of bank transactions in the books of bank and in the books of business / customer & preparation of bank account in the books of business & business / customer's A/C in the books of bank.
2) Every student should open saving bank account & should avail ATM Card & Net banking facility.

Topic No. 6: Bank Reconciliation Statement **30**

1) 10 Practical problem on Bank Reconciliation Statement from given, minimum 05 Practical Problems to prepare Bank Reconciliation statement with given discrepancies & minimum 5 practical problems to prepare bank reconciliation statement with given extracts of cash book & pass book.
2) Minimum 2 Practical problems from actual extract's of cash book and passbook

Topic No. 7: Trial Balance and Rectification of Errors. **20**

1) Minimum 05 Practical problems on preparation of trial balance i.e. gross trial balance & Net Trial Balance.
2) Minimum 10 practical problems on rectification of errors

Topic No. 8: Final Accounts of Sole Trader **40**

1) Minimum 20 practical problems on preparation of final Accounts of Sole Trader with minimum five adjustments.

Topic No. 9: Accounting with Tally Package **30**

1) Data entries in subsidiary books using Tally Package:-
2) Data entries & Preparation of cash books, Purchase register, Sales registers, Return registers, Journal proper, Various Ledger Accounts, Trial Balance, manufacturing, trading, profit & loss account & Balance Sheet (Data Entries of minimum 100 transactions).

Paper III: Fundamentals of Costing and Auditing (Y9)
Theory

Periods

Topic No. 1: Introduction to Cost Accounting **10**

1) Origin, Definition of cost, Cost unit, Cost Accounting, Cost Centre, Advantages and limitations of cost accounting, Cost Classification according to Elements, Behaviour, Traceability and Functions.

Topic No. 2: Material and Labour Cost **20**

A. Material Cost
   1) Meaning and definition of materials
   2) Classification of materials in to direct and indirect materials.
   3) Need Principles and importance of purchasing.
   4) Purchasing of materials.
   5) Procedure of purchasing.

B. Meaning of Stores
   1) Functions of Stores Keepers.

C. Stock Levels
   1) Maximum level.
   2) Minimum level.
   3) Re-order level.
   4) Average stock level.
   5) Danger level.

D. Store Ledger
   1) Meaning of store ledger.
   2) Specimen of store ledger.
   3) Store pricing issues method.
   4) FIFO, LIFO.

E. Labour Cost
   1) Meaning and definition of Labour.
   2) Classification of Labour into direct labour and Indirect Labour.
   3) Time Keeping Department – Meaning
   4) Time booking Department – Meaning
   5) Incentive payment system.

Topic No. 3: Unit Costing **30**

1) Meaning and concept of cost sheet.
2) Need importance, objectives and advantages of cost sheet.
3) Format of cost sheet.
4) Preparation of Cost sheet.
5) Meaning of estimated cost sheet.
6) Need of estimated cost sheet.
7) Preparation of estimated cost sheet.

Topic No. 4: Introduction of Auditing **10**

1) Origin of audit – Meaning of audit.
2) Definition of audit
3) Scope of audit
4) Objectives of audit
5) Meaning and definition of auditing
6) Principles of auditing
7) Advantages and limitations of auditing

Topic No. 5: Objects of Audit **20**

Primary Objects, Secondary Objects

1) Meaning of errors.
2) Kinds of errors.
3) Detection and prevention of errors.

4) Meaning of Frauds.
5) Kinds of Frauds.
6) Concepts of true and Fair View window dressing.

Topic No. 6: Classification of audit **15**

1) Qualities and qualifications of Auditor.
2) Responsibilities of an auditor.
3) Role of an auditor.
4) Duties of an auditor.
5) Statutory duties of an auditor regarding audit report.
6) Classification of Audit on the basis of -
    a) Authority b) Scope c) Time d) Objects e) Special audit.

Topic No. 7: Planning and procedure of an audit **15**

1) Audit planning.
2) Pre-Commencement and Considerations of an audit
3) Audit Program Preparation by Client for audit
4) Audit note book and working papers.

Practical

Periods

Topic No. 1: Introduction to Cost Accounting **30**

1) Preparation of chart showing classification of cost; according to element, behaviour, function, period, traceability and controllability.

Topic No. 2: Material and Labour Cost **50**

1) Preparation of specimen of; purchase requisition, inquiry, quotation, comparative statement, Invoice, Goods Received note, Goods inspection report, bin card.
2) Calculation of various stock levels, calculation of EOQ.
3) Preparation of store Ledger Account.
   Under FIFO and LIFO Method.
4) Preparation of Pay Roll and Job Card.

Topic No. 3: Unit Costing **50**

1) Preparation of chart showing step by step addition of cost.
2) Preparation of cost sheet and estimated cost sheet from given details. (Minimum 10 problems on cost sheet and 05 minimum problems on estimated cost sheet)

Topic No. 4: Objects of Audit **50**

Classification of expenditures & receipts

1) Profit and Loss under capital, Revenue and differed revenue, capital expenditure and Revenue expenditure, Capital Receipts and Revenue Receipts.
   (Minimum 05 practical problems)

Topic No. 5: Audit Planning and Procedure **30**

1) Preparation of Audit Programme.
2) Audit note book and working papers. (Minimum 5 practicals each)
3) Observing actual Audit procedure by visiting C.A Firm or any industries)

Topic No. 6: Visit Report **30**

1) Study of C.A. Firms / any Industries and prepare visit Reports after visiting.

Std. XII

Paper I: Office Motivation (Y7)

Theory

Periods

Topic No. 1: Secretarial Work in Relation to Meetings **15**

1) Meaning & Definition of Meeting
2) Importance of Meetings
3) Types of Meeting –
   I) Statutory Meeting
   II) Directors Meeting
   III) Annual General Meeting
   IV) Extra Ordinary General Meeting
4) Essentials of valid meeting-proper calling organizing & conducting meeting
5) Notice, Agenda, Quorum, Motion, Adjournment, Voting, Resolution, Proceeding & Minutes

Topic No. 2: Office Motivation **14**

1) Meaning and Definition of Motivation
2) Need for Motivation
3) Methods of Motivation
4) Principles of Motivation
5) Problems in Motivating employees
6) Meaning & definition of Leadership
7) Features and Types of Leadership
8) Qualities of Ideal Leader
9) Promotion – Meaning, Basis, Types and Policies of promotion
10) Transfer – Meaning, Basis & Policies
11) Demotion – Meaning, Basis, Causes & Policies

12) Suspension –Meaning & Features
13) Retirement – Meaning & Types
14) Absenteeism – Meaning & Definition, Causes, Remedies
15) Employees economic security – Meaning and Need
16) Concept of pension, gratuity and other retirement benefits
17) Recreational activities of employees, Meaning, Need & Types

Topic No. 3: Office Salary Administration 12

1) Meaning and Definition of office salary Administration
2) Objectives of Salary Administration
3) Importance of Salary Administration
4) Procedure of Salary Administration
5) Advantages of Salary Administration
6) Job Evaluation – Meaning, Definition and Importance, Procedure, Methods and Advantages.
7) Merit Rating- Meaning, Definition, Importance and Methods
8) Wage Payment- Meaning and Methods
9) Fringe Benefits- Meaning and Definition, Importance & Types

Topic No. 4: Office Employees Discipline 12

1) Meaning of Employees Discipline
2) Objective of Employees Discipline
3) Types, Need, Principles of Employees Discipline
4) Code of conduct
5) Features of discipline, Procedure of disciplinary action
6) Termination of Services
7) Service Book – Meaning and Content
8) Confidential Report – Meaning, Importance, Features
9) Leave – Meaning and Definition: - Types - casual, earned, commuted, extra ordinary, Maternity and paternity, medical, special, duty leave
10) Holidays –
    I) Declared by Government
    II) Declared by Collector
    III) Declared by Institutional Head

Topic No. 5: Office Financial Services & Banking Operations 20

1) Salary Bill – definition, Feature and Content
2) Budget – Meaning, Types, Advantages, Preparing budget for office factors to be considered while preparing budget, budget period and revision of budget.
3) Bank – Meaning, Definition & functions
4) Procedure of opening and operating bank account, types of bank account
5) Cheque – Meaning, definition, crossing and Endorsement
6) Bank Draft- Meaning and Definition, procedure of issue of bank draft, procedure of withdrawals and deposit in bank, withdrawal of cash by withdrawal slip, cheque & ATM, deposits by cash, by pay-in-slip & cheques.

Topic No. 6: Office Forms 15

1) Meaning, Objective of office forms
2) Importance and Types of office forms
3) Designing of office forms
4) Meaning and principles of Designing
5) Controlling office form – Meaning, Objectives, Procedures and Advantages

Topic No. 7: Demat Account 12

1) Meaning and Introduction of SEBI (Securities and Exchange Board of India)
2) Introduction of Demat Account
3) Meaning of Demat Account (BSE/NSE) (Bombay Stock Exchange & National Stock Exchange)
4) Merit of Demat A/C, Company, Investor and Broker
5) Demerit of Demat A/C, Fees Structure A/C, Opening fees, Annual maintenance fees, Custodian fees
6) Procedure of Dematerialization of security, opening account, submission of request
7) Forwarding DRF (Demat Requisition Form)
8) Forwarding DRF copy to Depository
9) Confirmation by depository, updating records by company
10) Confirmation of Demat to the depository, updating records by depositors
11) Confirmation by depository, updating records by participants
12) Confirmation of Dematerialization

Topic No. 8: Income Tax 20

1) Meaning of Assessee, Assessment, and previous year & assessed year.
2) Prediction & Exempted income, Definition & Meaning of Taxation, Features, Types, Scope & objectives of income tax
3) Exempted income & Deduction under Income Tax Act 1961
   Different Heads of Income (only theory)
   I. Income from Salary
   II. Income from House Property
   III. Income from business & Profession
   IV. Capital gain
   V. Other sources

4) Definition of:-
   I. Salary U/S 15 to 17
   II. Income exempted U/S 17
   III. Deduction from salary U/S, 16
   IV. Prerequisite U/S 17/ (2)
   V. Profits in lieu salary 17/ (3)
   VI. Steps in computation of income from salary
   VII. Computation of gross salary
   VIII. Computation of deduction U/S 16
   IX. Deduct (B) from (A)
   X. Structure of form 16A

Practical

Periods

Topic No. 1: Secretarial Work 30

1) Drafting Notices and agendas of meeting
2) Drafting various types of resolutions passed in meeting
3) Writing proceeding and minutes of the meeting, procedure of meeting and conferences
4) Preparation of PROXY forms
5) To organize mock-up of program on the entire

Topic No. 2: Office Motivation 28

Minimum 05 Practicals on:-

1) Preparing a motivational plan for office employees containing positive and negative motivation factors
2) Drafting a promotion letter
3) Drafting a transfer letter
4) Drafting a demotion letter with causes
5) Drafting a suspension letter mentioning causes of suspension
6) Drafting a letter appreciating valuable services in organization at the time of retirement
7) Conducting 01 visit to business organization to study the cause effects and remedies of absenteeism

Topic No. 3: Office Salary Administration 24

Minimum 05 Practicals on:-

1) Preparation of specimen of attendance register, salary sheet, salary slip, TA & DA bill
2) Visits to an office for studying the procedure for preparation of salary sheet and TA & DA bill
3) Prepare merit rating chart
4) Prepare group Insurance plan and demonstrate

Topic No. 4: Office Employees Discipline 24

Minimum 05 Practicals on:-

1) Preparing a memo to employees who is remained absent in office since last 15 days without consent
2) Preparing a report of bad conduct at employee before taking disciplinary action
3) Preparing a specimen showing contents at service books
4) Preparing a confidential report of concern employee
5) Preparing application for following leaves
    a. Casual leave
    b. Medical leave
    c. Duty leave

6) Preparing a medical certificate writing down a report on conference on motivation aspect for submitting higher authorities. If an employee have received order from his higher authorities to attend a conference on motivation aspect of employees.

Topic No. 5: Office Financial Services & Banking Operation 40

Minimum 03 Practicals on:-

1) Preparing a salary sheet of office employees
2) Preparing a salary slip of any employee
3) Preparing a salary certificate of any employee
4) Preparing form no 16 A of any employee with imaginary data
5) Preparing a profoma of pay in slip withdrawal slip, cheque, bank draft
6) Preparing a loan proposal of any employee for purchasing a motorcycle or car etc
7) Preparing budget for next year for office stationary
8) Preparing a budget for next year for office employees salary
9) Preparing and filling of forms used in banking operations i.e. account operating form, nomination form, specimen signature card, pay-in-slip, withdrawal slip, cheque, pass book, promissory note, bank draft, mail transfer form etc.
10) Visit to a bank to acquaint the students with the procedure of opening and operating bank account
11) To acquaint the students with the procedure of opening and operating bank account
12) Familiar the students with the procedure and type of crossing and endorsement of cheque
13) Arrange at least one visit to bank to study the banking operations

Topic No. 6: Office Forms 30

Minimum 05 Practicals on:-

1) Preparation of forms used in the office-bills invoice, cash memo, credit memo, receipt voucher, Debit note, credit note etc.
2) Acquaint students with the procedure of designing and controlling office forms
3) Visit to the concerned office to study designing, using & controlling office forms

Topic No. 7: Demat Account 24

Minimum 05 Practicals on opening DEMAT Account:-

1) To collect necessary documents for Demat A/C
2) Filling of Demat A/C opening forms
3) Submission of Demat requests & scrip certificate by investor
4) Forwarding DRF & SCRIP certificate to register
5) Forwarding a copy at DRF to depository
6) To get confirmation of receipts of DRF by depository
7) To get confirmation at dematerialization to depository
8) Updating records of depository participants

Topic No. 8: Income Tax **40**

1) Practical Training in filling Income Tax returns forms (minimum 10 practicals). Filling the forms for tax deducted at source & procedure to avail the same (minimum 10 practicals) Computation of taxable income & income. Tax-salary & individual income, simple problems (minimum 10 practicals) preparing form No-16 A (minimum 10 practicals).

Paper II: Advanced Financial Accounting (Y8)
Theory

Periods

Topic No. 1: Depreciation Accounting **20**

1) Meaning and causes of depreciation. Depreciation accounting under straight line & written down value method.

Topic No. 2: Accounting of Consignment Transactions **25**

1) Meaning and Necessity of Consignment, parties to consignment-consignor, consignee, difference between consignment and sale.
2) Losses in Consignment:- Normal and Abnormal
3) Commission:- Ordinary, Del-Creder, over-riding
4) Valuation of stock on consignment, journal entries of consignment, dealing in the books of Consignor and Consignee and preparation of Consignment account, Goods sent of Consignment A/C, Consignees A/C, and Abnormal Loss A/C for Consignor and Consignors A/C in the books of Consignee.

Topic No. 3: Single Entry System of Accounting **15**

1) Meaning and Features of single entry system, Accounts maintained in the single entry system, Distinction between single entry and double entry system, methods of calculation of profit; statement of affairs method only.

Topic No. 4: Accounts of Non-Trading Concerns **20**

1) Meaning, Features and objects of non-trading concerns, distinction between trading and non trading concerns, Trust deeds/by laws of non-trading concerns, books of accounts to be maintained.
2) Preparation of final accounts: - Receipts & payment Account, Income & Expenditure Account and Balance sheet.

Topic No. 5: Partnership Accounts **25**

1) Meaning, Definition, Characteristics, Maximum and Minimum no. of partners. Types of partners, partnership deed and important clauses of the deed, implied provision of partnership Act, methods of maintaining partner's capital accounts:- Fixed and fluctuating capital Methods. Necessary adjustments in P & L appropriation a/c & distribution of profit.

2) Admission of a partner- Accounting Treatment-Revaluation of assets and liabilities, treatment of goodwill and capital brought in, preparation of revaluation account, partners capital account, cash/bank account and balance sheet.
3) Partnership Final Accounts - Trading and profit & loss account, P & L appropriation A/C and balance sheet of the partnership firm.

Topic No. 6: Study of Financial Statement Ratio Analysis 10

1) Meaning, Advantages, Necessity, Utility of Ratio Analysis, Vertical forms of profit & loss account & balance sheet. Meaning, Advantages, Necessity, Utility of Revenue statement ratios. Balance sheet ratios & combined ratios.

Topic No. 7: Classification of Expenditure & Receipts 05

1) Classification of expenditure & receipts under capital, revenue deferred revenue expenditure, receipts, profits & losses-Meaning of Capital expenditure, receipts, profits, revenue expenditure, receipts, profit deferred revenue expenditure etc.

Practical

Periods

Topic No. 1: Depreciation Accounting 30

1) Depreciation Accounting: - Under straight line & written down value method. (Minimum 10 practical problem on each method)

Topic No. 2: Accounting of Consignment Transactions 40

1) Documentation of consignment Dealings: - Preparation of proforma invoice, account sale, payment vouchers for expenses of consigner and consignee, journal vouchers for commission, receipts for advance and final remittance from consignee.
(Minimum 05 practical problems out of which 2 should be based on actual record of various dealers/agencies)

Topic No. 3: Single Entry of Accounting 30

1) Minimum 10 practical problems on statement of affairs method.
(Minimum 10 problems should be given for practices.)

Topic No. 4: Accounts of Non-Trading Concerns 40

1) Minimum 10 practical problems on preparation of income & expenditure and balance sheet from the given receipts & payment account.
2) Minimum 5 practicals on preparing members register, subscription register, dead stock register, notice of governing body & annual general meeting, receipts and payment account of non-trading concerns from the given transactions
(Minimum 1 practical based on actual record)

Topic No. 5: Partnership Account **40**

1) Form 'A' registration of partnership firm, Form 'E' change in constitution of partnership firm and preparation of partnership deed from the information given, Retirement and Death of a partner-Accounting Treatment-Dissolution of partnership firm-Meaning and procedure of dissolution, journal entries for dissolution
   (Minimum 5 practicals each on retirement, death and dissolution of the firm)

Topic No. 6: Study of Financial Statement [Ratio Analysis] **25**

1) Minimum 5 practicals on Profit and Loss and Balance Sheet (simple problems). Minimum 5 practicals on Calculation of Revenue statement ratio, Balance Sheet ratios and Combined Ratios their meaning and interpretation.
2) Minimum 5 practicals based on actual annual reports of companies, problems on Revenue statement ratios, Balance sheet ratios and combined ratios with vertical form of Income Statement & Balance Sheet.

Topic No. 7: Tally based Accounting **20**

1) Data Entries and preparation of cash book, purchases register, sales register, Returned registers, Journal proper, various Ledger Accounts, Trial Balance, Receipts and payment accounts, Income & Expenditure accounts, Manufacturing, Trading, Profit & Loss accounts and Balance Sheet.
   (Minimum 10 practicals of Data Entries of minimum 20 transactions each)

Topic No. 8: Classification of Expenditure & Receipts **15**

1) Preparation of separate lists for every class of expenditure.
   (5 practicals of at least 50 items each)

Paper III: Advanced Costing and Auditing (Y9)
Theory

Periods

Topic No. 1: Contract Costing **15**

1) Introduction to contract costing, meaning of contract costing, Items charged to contract account, concept of profit on incomplete contract, work, certified and uncertified contract WIP (Work in Progress), and Escalation clause. Specimen of contract costing preparation of contract account.

Topic No. 2: Budget and Budgetary Control **15**

1) Meaning of budget, need of budget, objectives of budget, Advantages and limitations of budget meaning of budgetary control, objectives of budgetary control, essentials of effective budgeting, types of budgets - sales budget, cash budget, problems

Topic No. 3: Reconciliation of Cost and Financial Accounts **15**

1) Meaning, Need of Reconciliation statements. Reasons for disagreement in Profit, Methods of Preparing Reconciliation Statement.

Topic No. 4: Marginal Costing **20**

1) Meaning and definition of marginal cost and marginal costing. Uses/Advantages of marginal costing, Limitations of marginal costing, Contribution concepts, profit volume ratio, meaning of Break-Even point, meaning of margin of safety, calculation of p/v ratio, BEP and M/S. Break even chart, meaning of angle of incidence, problems.

Topic No. 5: Standard Costing **20**

1) Meaning and definition of standard cost and standard costing, Advantages of standard costing, Limitations of standard costing, concept of variances. Meaning of material cost variance. Material price variance, material usage variance, material mix variance, material yield variance. Calculation of variances by using suitable formula. Meaning and calculation of labour cost variance, labour rate variance, labour efficiency variance, labour mix variance, problems

Topic No. 6: Vouching **15**

1) Meaning and definition of vouchers and vouching, objectives of vouching, Essential steps of vouching, study of cash memo, credit memo, receipt, debit note, credit note, bill, invoice, cash expense voucher and pay bill.
2) Vouching of cash purchase, sales, capital, revenue expenditures and incomes.

Topic No. 7: Verification and Valuation of Assets and Liabilities **10**

1) Meaning and objectives of Verification and valuation of assets and liabilities, Distinction between verification and vouching. Distinction between verification and valuation. Valuation of different Assets and liabilities.

Topic No. 8: Audit Report **10**

1) Meaning of audit report, types of audit report, points to be considered while preparing audit report, audit report of co-operative society, joint stock company, sole Trader, Partnership.

Practical

Periods

Topic No. 1: Contract Costing **30**

1) Practical problems on preparation of contract account, calculation of profit on incomplete contract and work in progress (WIP)
(Minimum 15 problems)

Topic No. 2: Budgetary Control **30**

1) Practical problems on sales budget, cash budget.
   (Minimum 10 problems)

Topic No. 3: Reconciliation of Cost and Financial Account **30**

1) Practical problems on Reconciliation statement.
   (Minimum 20 problems)

Topic No. 4: Marginal Costing **40**

1) Practical problems on calculation of contribution p/v ratio (Profit Volume Ratio), BEP, Margin of Safety. preparation of Break Even chart
   (Minimum 20 problems)

Topic No. 5: Standard Costing **40**

1) Practical problems - Calculation of material cost variance, material price variance, material usage variance, material mix variance and material yield variance.
2) Calculation of labour variances - Labour cost variance, labour rate variances, labour efficiency variances, labour mix variance, labour sub efficiency variance.
   (Minimum 20 problems)

Topic No. 6: Vouching **30**

Vouching of following items :- Cash sales, Receipt from debtors, Receipt from bills receivables, income from investment, sale of fixed assets, sale of investments, loan taken, bad debt recover, wages, payment to creditors, salaries, travelling and salesman commission, insurance premium, loans granted, Advertisement expenses, Rent paid, Repairs to building, Repairs to machinery, withdrawal from Bank, Petty cash payment, credit purchase, sales, sales on higher purchase, sales return, purchase return.

Topic No. 7: Verification and Valuation of Assets and Liabilities **20**

Verification and valuation of plant & machinery, building, furniture and fixtures, Leasehold property, Goodwill, Tools and equipments, stock, debtors, bills receivables, investments, share capital, loans and advances, creditors.

Topic No. 8: Audit report **20**

Preparation of clean and qualified audit report of sole traders, partnership, co-op societies, joint stock companies.
(4 reports of each type)

2. MARKETING AND RETAIL MANAGEMENT (H1, H2, H3)

SCHEME OF EXAMINATION

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	Oral	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	MARKETING AND SALESMANSHIP	80	3	80	3	10	10	10	10	200	100
2	RETAIL MARKETING SERVICES	80	3	80	3	10	10	10	10	200	100
3	RETAIL MARKETING	80	3	80	3	10	10	10	10	200	100

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	OJT	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	ADVANCED RETAIL MARKETING	80	3	80	3	10	10	10	10	200	100
2	MARKET RESEARCH & FOREIGN TRADE	80	3	80	3	10	10	10	10	200	100
3	RURAL MARKETING & STOCK EXCHANGE	80	3	80	3	10	10	10	10	200	100

*OJT: ON THE JOB TRAINING

Introduction

The existing Marketing and Salesmanship included in Commerce group now is renamed as Marketing and Retail Management.

New Syllabus Includes all the details in theory as well as knowledge practical to the relevant subjects and their contents, also the latest version in respects of various aspects of the related subjects which provides that a student has opportunity to obtain recent knowledge of above mentioned subjects which is useful to him in getting easy appointment in the industry and also useful to establish self employment.

Objectives

The basic objectives of this syllabus are as follows-

1. To introduce the student to the concept of new marketing, Importance of Salesmanship in the today's commercial world and new advertisement techniques and role of media in modern commerce.
2. To give the students basic knowledge, principles and practice of salesmanship and marketing including marketing management, market research, Product planning and pricing policies.
3. To familiarize the students with case studies in respect of marketing, advertising and salesmanship of different products in various situations.
4. To make the students more familiar with the skills of practitioner engaged in buying, selling, marketing and advertising.
5. To acquaint the students with the commercial world through commercial transaction, commercial organizations and commercial personnel.

Job Opportunities

The following are the job opportunities available for those perusuing the vocational course in Marketing and Retail Management.

A) Wage Employment

1. General Salesman
2. Sales Assistant/Shop Assistant/ Counter Salesman/ Demonstrators
3. Retail Salesman
4. Street Vendors e.g. Hawker, Newspaper Seller etc.
5. Wholesale Salesman, Selling Agent
6. Purchasing Agent/Buyer
7. Sales Representative, Technical Salesman/Demonstrators
8. Travelling Salesman/Touring Salesman
9. Auctioneer/Auction Crier/Auction sales conductors
10. Insurance Agent

11. Property/Estate Broker/Property Agent Dealer
12. Share Market Broker/Dalal
13. Export Salesman
14. Fashion Model
15. Grader
16. Retail Salesman in Malls
17. Warehouse Assistant
18. Market Information Provider/Price Reporter
19. Procurement Agent
20. Co-operative Assistant

B) Self Employment

1. Wholesaler
2. Retailer
3. Commission Agent
4. Transport Operator
5. Share Broker
6. Travel Tourism Agency
7. Network Marketing
8. Delivery Agent
9. Real Estate Dealer
10. Retail Shops
11. Advertising Agency
12. Junior Associates in Malls, Franchisee of Big Bazar

Std. XI

Paper I: Marketing & Salesmanship (H1)

Theory

Periods

Topic No. 1: Salesmanship: Introduction **30**

1) Definition, Meaning & Importance of Salesmanship, Fundamental of selling. Duties, Responsibilities & Qualities of Salesman, Sales Management, Organization structure, Sales Quotas & Sales territories.

Topic No. 2: Marketing **30**

1) Market, Marketing, Marketing Management, Concept of a) Marketing programme b) Marketing expenses budget c) Consumer goods & Industrial Goods.

Topic No. 3: Marketing Mix **30**

1) Concept of Marketing Mix & Product Mix, Pricing Policies, Channels of Distribution, Wholesaler & Retailers.

Topic No. 4: Advertising **30**

1) Meaning & Definition of Advertisement, Importance of advertising, Media of Advertising, Advertising & Publicity, Advertising Agency & its functions & importance. social media of advertising.

Practical

Periods

Topic No. 1: Salesmanship **80**

1) Application for the post of Salesman
2) Interview with different type of salesman (Any 5)
3) Report writing –
   Daily, Weekly – Monthly (Any 5)
4) Undertake a programme for door to door selling for any consumer product and prepare a brief report.

Topic No. 2: Marketing **80**

1) Preparation of an organization chart of a marketing department of an imaginary company.
2) Prepare a budget for marketing expenses.
3) Interview with direct marketer, mobile marketer
4) Prepare a list of skills required for tele-marketing on the basis of observation.

Topic No. 3: Marketing Mix **40**

1) Prepare a study report based on 4 P's (Product, Price, Place and Promotion) consumer products or luxuries product.
2) Collect the information of various brands and analyze it.

Topic No. 4: Advertising **40**

1) Prepare an advertisement for launching a product (Automotive Electronic, Construction material, fast foods, Cosmetics and Jewelry)
2) Prepare a comparative advertisement study report, based on a comparison of two similar type of product of any category.
3) Prepare an advertisement layout for a particular product in two ways
   a) Print b) Audio Visual
4) Prepare a study report based on the observation of a particular product by observing the contents of:
   a) Print advertisement and
   b) Audio Visual advertisement
5) Prepare a study report based on a visit given to an Advertising Agency.

Paper II: Retail Marketing Services (H2)

Theory

Periods

Topic No. 1: Customer Service Orientation **25**

1) Meaning, definition, importance of customer, types of customer, customer's objections and its handling.
2) Customer's Psychology:
   Customer's rejection in various types of consumer goods, meaning of customer psychology & its importance
3) Consumerism:
   Consumer protection act, meaning and definitions of important concepts.

Topic No. 2: Banking and Insurance **30**

1) Banking
   A) Meaning, functions, KYC norms, E Banking, Tele mobile banking, ATM Services credit and debit cards. Types of loans and advances. NEFT, RTGS
   B) Central Bank, Meaning, definition, functions, credit control tools, C.R.R and SLR. & Types of Banks.
2) Insurance
   A) Introduction, meaning, definition, importance, Life Insurance and general insurance – procedure for settlement of insurance claims.

Topic No. 3: Retail Trade logistics Services **30**

1) Transportation –
   Meaning, importance, Types: Rail, Road, Air, Water, Merits and demerits of each type, various documents used in transportation.
2) Warehouse -
   Meaning, Importance, types, functions of warehousing, grading, standardization, packing and packaging
3) Delivery services -
   Meaning, Importance and procedure
4) Inventory control -
   Meaning, importance, general procedure of inventory taking.

Topic No. 4: Element of Book Keeping **35**

1) Book Keeping Introduction
   Meaning, definition, objectives, importance and classification of accounts
2) Double entry Book-Keeping system.
   Information about: Journal, ledger, subsidiary books, cash book, trial balance, final accounts.

Practical

Periods

Topic No. 1: Customer Service Orientation **40**

1) Visit to:
a) Trade fair
b) Exhibitions
c) Departmental stores
d) Super Market etc
   And write a brief report, based on visit
2) Conduct an interview with various types of customers for importance of window display and prepare a summary in brief
3) Collect information about four cases of consumer court result (From lodging complain-up to result)
4) Prepare a study report in brief on various buying motives for five product suggested by teachers / Instructor

Topic No. 2: Banking & Insurance **60**

1) Collect specimen and fill it with imaginary information on following:-
   a. Loan application (general)
   b. Application for C.C.
   c. Application for O.D.
   d. Application for gold loan
   e. Application for Car loan
   f. Loan application for housing

2) Prepare a synopsis on guest lecture conducted by teachers / Instructor (Guest – Bank Official)
3) Fill in up an Insurance proposal form
   a. Life Insurance
   b. Mediclaim insurance
   c. General insurance
4) Comparative study of a specific plan of two different insurance companies. Such as: -

   Children plan

   Pension Plan

   Mediclaim plan etc
5) Study of documents used in settlements of Insurance.

Topic No. 3: Retail Logistics Services **60**

1) Collect Lorry receipts and railway receipt in photo copy format. Prepare format and fill in up imaginary entries.
2) Write a report on visit to a warehouse.
   a) Interview with movers & packers to identify functions, packaging material & delivery
   b) Study of functions performed by courier service agencies / pizza Hut etc.

Topic No. 4: Element of Book- Keeping **80**

1) Record imaginary 200 entries of a company with the help of Tally software
2) Maintain Dummy books of accounts of a retail shop (Minimum 200 entries)

Paper III: Retail Marketing (H3)

Theory

Periods

Topic No. 1: Retail Marketing **30**

1) Meaning, definition and importance of retail marketing, classification and organization structure in retail. Difficulties of rural retailing.

Topic No. 2: Product Management and Merchandising **30**

1) Introduction, definition of product, meaning and definition of product management, product mix, stock shrinking, merchandising meaning & methods.

Topic No. 3: Retail Pricing & Promotion **30**

1) Introduction, meaning, importance of pricing and importance of promotion in retailing.
2) Communication in retailing. Types and barriers of communication

Topic No. 4: Non-store Retailing **30**

1) Introduction – Meaning of retailing – advantages and disadvantages of e-retailing.
2) Logistics and Tele marketing
   Concept, technology, e-tendering

Practical

Periods

Topic No. 1: Retail Marketing **70**

1) A study in brief about display of various goods kept / arranged in: Departmental stores
   Super Markets
   Exhibition
2) Visit and prepare a workflow chart of floor management of a departmental store.

Topic No. 2: Product Management and Merchandising **70**

1) Differentiate and prepare a report on
   Display & marketing of existing / regular product
   Newly introduced product
2) Identify slow moving and fast moving products and prepare a list by visiting a retail grocery shop.
3) Study & prepare a brief report on various technologies used in retail stores: -
   i)EDI ii) RFID iii) SAP iv) ERP v) EFT vi) Bar Coding

Topic No. 3: Retail Pricing & Promotion **50**

1) Conduct interviews with a retailer to identify following pricing strategy:
   a. Market plus pricing
   b. Competitive pricing
   c. Discount pricing
   d. Off season pricing
   e. Skim the cream pricing
   f. Market penetration pricing
2) Write minutes based on group discussion on promotion & selling of a product in brief.

Topic No. 4: Non-store Retailing **50**

1) Write an essay on tele-marketing through TV Channels.
   a. List out channels
   b. List out products
   c. List out websites
   d. Procedure of payment

Std. XII

Paper I: Advanced Retail Marketing (H1)

Theory

Periods

Topic No. 1: Health, Safety and Hygiene in Retailing 35

1) Meaning of Healthcare activities and Hygiene in Retail store.
2) Importance of safety and security
3) First aid, safety education, safety norms and its procedures
4) Safety equipments, safety rules and regulations. Measures taken in case of - fire, crime, riots, evaluation procedure.
5) Work ethics in Retail stores.

Topic No. 2: Customer Services in Retail Trade 25

1) Types of Customers, Buyer's behaviour, customer Psychology, various types of buying motives and impact of buying motives.
2) Types of customer services in retail stores.
3) Experimental Selling and customer retention.
4) Customer relations in retail management.

Topic No. 3: Billing procedure and cash handling in Retailing 30

1) Basic steps and procedures in billing, example: service tax, sales tax, VAT, other duties etc.
2) Methods of handling cash receipts and payments.
3) Various methods of receiving payments from customer: through cheques, debit cards, credit cards, mobile and internet banking etc.

Topic No. 4: Supply Chain Management [SCM] 30

1) Importance of (SCM) Supply Chain Management.
2) Listing out the benefits of (SCM) Supply Chain Management in retailing
3) Advantages of SCM in retailing
4) Steps and process of (SCM) Supply Chain Management in retailing
   a. Demand planning and forecasting
   b. Source procurement
   c. Production or assembly step
   d. Distribution of goods/Services
   e. After sales services
   f. Sales return – detective or excess goods.

Practical

Periods

Topic No. 1: Health, Safety & Hygiene in Retailing 60

1) Yoga and physical Training, Pranayam, Dhyan, Suryanamaskara, Standing P.T. Sitting P.T.
   a. Practice of First Aid
   b. Maintenance of (FAK) First Aid Kit for handling accidental cases.
2) An Interview with Security personnel. (Precaution & Measures taken)
3) Study of Security equipment such as: Security camera (CCTV), Metal detector etc. Fire extinguisher, sand buckets etc.

Topic No. 2: Customer Services in Retail Trade 60

1) An interview with Retail salesman to acquaint students with types of customer observation by students:
   Regarding customer's services in Retail store
2) Study of various techniques
   Used for customer relations in Retail trade.

Topic No. 3: Billing Procedure and Cash handling in Retailing. 60

1) Find out the stages or sequence for billing in Retail Store.
2) Computation of Sales Tax VAT & other taxes on various goods sold in Retail Stores.
3) Practice on contents of Dummy Bills for consumer goods such as garment, electronics, cosmetics etc.
4) Problems on Bank Reconciliation Statement.
5) Coding & decoding procedure for billing. Practicing on Swap machine to acquaint with net banking
6) Implement earn and learn scheme through college with various retail stores.

Topic No. 4: Supply Chain Management (SCM) 60

1) Arrange Interactive lectures on this Topic No. 4 and get feedback of students in brief report format
2) Visits to logistics centres and find out various components and get it in brief report format
3) Role playing games for (S.C.M) supply chain management stages.
4) Preparation of report on any one method of Inventory control

Paper II: Market Research & Foreign Trade (H2)

Theory

Periods

Topic No. 1: Marketing Research 30

1) Meaning, importance, aims and limitations of Marketing Research: - Introduction, Definition, concept, importance, scope, aims and objectives limitations, advantages.
2) Classification of Marketing problems: - Industry elements and company elements
3) Areas of Marketing Research :- Market, Research, Product Research, Pricing Research, Sales Research, Advertising and promotion Research Distribution Research, Customer Research
4) Steps in Marketing Research or procedure of marketing Research:-
   a. Crystallising the marketing problems.
   b. Identifying the Research problems.
   c. Determining the information needed and its relative sources.
   d. Obtaining the relative facts and data.
   e. Analysing and interpreting the facts with reference to the problems
   f. Preparing research report – incorporating the findings.
5) Meaning, importance and need of MIS: -
   Types of data: -
   a. Primary data, secondary data
      - Sources of data – Internal and External sources
      - Methods of collection of data –
      a. Survey method –
         Questionnaire
      b. Need and importance of Questionnaire characteristics of good questionnaire
         i. Survey through mail
         ii. Telephonic survey
         iii. Panel Survey
      c. Experimental method
      d. Observation method

      Analysis of collected data: - statistical computation methods, charts tables, percentages, averages etc

      Test marketing

      Potential prospects

Topic No. 2: Demand Analysis 30

1) Demand: - Introduction, meaning and types
   a. Forecasting demand
   b. Manipulating demand
   c. Elasticity of demand
   d. Short term vs. long term demand
2) Factors affecting demand:-
   a. Price

b. Population
c. Income
d. Satisfaction
e. Competition
f. Substitution
g. Advertising

3) Sales forecasting:-
Introduction, definition, concept and methods of sales forecasting
   a. The Jury of executive opinion method
   b. The sales force composite method
   c. The user expectation method
   d. Statistical & Quantitative method
   e. The trend and regression method
4) Advantages and disadvantages of all above methods.
5) Types of sales forecasting
   a. Short term forecasting
   b. Long term forecasting
      Objectives of all above
6) Test marketing – objectives and findings – stimulation Games
7) Market segmentation
   a. Introduction, objectives, definition, meaning, importance of market
   b. Segmentation
   c. Classification
   d. Geographic, Demographic
   e. Psychographic and behavioural

Topic No. 3: Buyer's Behaviour 25

1) Buyer's behaviour and classification of buying motives.
2) Meaning, Definition & importance of Buyer's behaviour
3) Factors affecting buyer's behaviour –
   A) External B) Internal

A) External

a. Individual Income
b. Family Income
c. Expectations
d. Credit facilities
e. Govt. Policies
f. Sociological factors
g. Cultural factors

B) Internal

a. Personal factors
b. Psychological factors
c. Perception
d. Attitude
e. Motivation
f. Learning
g. Personality

4) Primary or initial buying motives and secondary buying motives. Emotional, buying motives, rational buying motives.

Topic No. 4: Foreign Trade **35**

1) Foreign Trade:-
   Introduction, meaning, definition, importance, advantages and disadvantages
   Problems in foreign Trade
2) Trade Agreements
   Present trends in foreign trade –
   Import, Export
   International marketing
   Agencies helping in International marketing
3) Import Trade: Meaning, need, nature and importance, Role of Indent house
   Import licensing and Quota
   Import trade procedure
4) Export Trade: Meaning, importance, need of export trade.
   Export trade procedure
5) Agencies participating in Export trade. Documents used in Export Trade
   a. FOR/ FOW [Free on Road / Rail/ Free on Wagon]
   b. FOB [Free on Board]
   c. FAS [Free Along with the Ship]
   d. C & F [Cost and Freight]
   e. C. I. F [Cost, Insurance and Freight]
   f. Bill of Lading

Practical

Periods

Topic No. 1: Marketing Research **60**

1) Prepare questionnaire for any one consumer product
2) Undertake survey work for any one P (Product, place, promotion, price, people)
3) Obtain a survey Report and prepare your opinion on it.

Topic No. 2: Demand Analysis **60**

1) Prepare a report on demand estimate for consumer product such as dairy product, vegetables, beverages, bakery product etc in your locality / street
2) Interview with a retailer to know demand fluctuation and prepare statistical data to understand the 5 cases of fluctuation in demand
3) Prepare a report for sales forecasting of a retail store.

Topic No. 3: Buyer Behaviour **60**

1) Prepare a questionnaire for knowing buying habits, brand loyalty and price consciousness of products, Such as - mobiles, cosmetics laptop, car etc.
2) Conduct a small survey on above
3) Prepare a report on above information.

4) Prepare a report on buying motives expressed through T.V. advertisement for a same product by different company's brands, such as - tooth paste, bath soap, mobile sim cards, water purifier, face cream etc.

Topic No. 4: Foreign Trade **60**

1) Browse and find out information through website of agencies helping international market
2) Write an Interview Report based on difficulties in foreign trade by interviewing foreign trader (Agri goods, manufactured goods etc)
3) Preparation of documents used in Foreign Trade & collect various types of specimen
4) Visit Report based on a visit given to foreign trader.

Paper III: Rural Marketing & Stock Exchange (H3)

Theory

Periods

Topic No. 1: Rural Marketing **25**

1) Meaning of rural marketing, Nature, scope & importance of rural marketing, Classification of rural market - Organised & Unorganised, Functions of rural marketing e.g. trading, packing, storage, branding, processing, financing,
2) Co-operative marketing – meaning, definition, objective, advantages, Limitations
3) Agency involved in Co-operative marketing.

Topic No. 2: Agricultural Marketing **25**

1) Meaning, Introduction, definition of Agricultural marketing, Structure & types of agricultural, marketing, various marketing agencies. Agricultural pricing policy, Distinguish between Regulated marketing & co-operative marketing, Marketing of agricultural Produce, crops Beverage tea- coffee, cash crops, Agro based product etc.

Topic No. 3: Stock Exchange **40**

1) History, meaning, definition of stock Exchange.
2) Listing of Securities - Meaning, Procedure, Stock Exchange market in India NSE, BSE, SEBI,

Topic No. 4: Financial Markets **30**

1) Financial Markets & Money Market – Meaning, Definition and functions of financial market
2) Money Market – Meaning, Definition, Importance, characteristics, Instruments of money market.
3) Capital Markets – Meaning, Definition, Importance, characteristics, Instruments of capital market. Distinguish between Money Market & Capital Market, Primary Market & Secondary Market.

Practical

Periods

Topic No. 1: Rural Marketing 50

1) Report writing based on visit to wholesaler, retailer' co-operative stores, khadi bhandar and village markets
2) Arrange an activity for actual purchase and sale of agri products in rural area and prepare a report thereon
3) Prepare a report based on an interview with wholesaler, retailer and market committee member

Topic No. 2: Agricultural Marketing 50

1) Prepare a Report based on a visit given to a co-operative marketing store and societies
2) Prepare a report based on a visit given to a regulated market
3) Observe & prepare a report on activities of agricultural produce market.
4) Prepare a visit Report based on a visit to cold storage and kharedi vikri sangh
5) Prepare a visit Report based on a visit given to rural based business engaged in agriculture produce such as dairy, fruits, flowers, vegetables etc.
6) Collect data from agro information centre regarding information provided to the beneficiaries in a particular week

Topic No. 3: Stock Exchange 70

1) Prepare an Interview Report based on an interview arranged with a share broker regarding listing of securities e.g. Motilal Oswal, Sherkhan, Anand Rathi etc.
2) Select any three industries sector and choose at least five companies. study & record the trend of shares e.g. Cement, IT, Banking, Automobiles and Textiles etc.
3) Prepare a dummy DMAT pass book with imaginary entries. (Minimum 25)
4) Collect ten (IPO) Initial Public Offer forms and fill in with imaginary information therein.
5) Watch business T.V channels and prepare a summary on knowledge obtained by observer

Topic No. 4: Financial Marketing 70

1) Conduct an interview with financial analysi & get the knowledge of money market and capital market and summarise it in a Report form
2) Prepare a precise report on interview with a financial consultant related to the turnover of capital market in a particular week.
3) Prepare dummy papers (format) used in transacting capital market and exercise on it.

3. LOGISTICS AND MATERIAL MANAGEMENT (H4, H5, H6)

SCHEME OF EXAMINATION

Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	Oral	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	PURCHASE MANAGEMENT	80	3	80	3	10	10	10	10	200	100
2	LOGISTICS AND WAREHOUSING	80	3	80	3	10	10	10	10	200	100
3	BANKING AND ACCOUNTING	80	3	80	3	10	10	10	10	200	100

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	OJT	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	RETAIL MANAGEMENT	80	3	80	3	10	10	10	10	200	100
2	SECURITY AND SAFETY EQUIPMENTS	80	3	80	3	10	10	10	10	200	100
3	SUPPLY CHAIN MANAGEMENT	80	3	80	3	10	10	10	10	200	100

*OJT: ON THE JOB TRAINING

Introduction

The existing course 'Purchasing & Storekeeping' from commerce group is now renamed as 'Logistics and Material Management'. It includes three new subjects for each standard.

For Std. XI, the subjects are-

1) Purchase Management
2) Logistics and Warehousing
3) Banking and Accounting

For Std. XII, the subjects are-

1) Retail Management
2) Security and Safety Equipments
3) Supply Chain Management

New syllabus includes all the important aspects of trade and commerce. Banks, logistics, accounts, transportation, market supply chain plays very important and key role in the modern trade and commerce. Commerce students must acquire accurate and deep knowledge of these areas. So that he can get employment in all these areas, also it is very useful for self employment.

Objectives

To enable student-

1) To give knowledge of all important and key areas included in trade and commerce.
2) To give latest knowledge of all purchasing methods, such as e-marketing, e-purchasing, e-retailing, tele marketing.
3) To give knowledge of modern banking business.
4) To give knowledge of supply chain in the market.
5) To give full knowledge relating to tally operation.
6) To give information about logistics and transportation, so that student can have employment and also start his own business in that field.
7) To give full knowledge in the area of security and safety equipments in Industries.

Job opportunities

A) Wage Employment

1) Purchase Assistant
2) Purchase Manager
3) Purchase Clerk
4) Store Keeper

5) Store Manager
6) Store Assistant
7) Receipt Clerk
8) Issue Clerk
9) Bank Clerk
10) Transport Company Clerk
11) Accountant
12) Accounts Manager
13) Ware house Keeper
14) Security Guard
15) Security Manager
16) Supply chain Manager
17) Insurance Agent
18) Import Export Agent
19) Logistic Supplier
20) Marketing Manager
21) Market Surveyor
22) Computer Operator
23) Tally Operator
24) Human Resource Manager
25) Post Clerk
26) Postman
27) Book Keeper
28) Sales Supervisor
29) House Keeper
30) Delivery Boy or Courier Boy

B) Self Employment

1. Agent
2. Broker
3. Clearing Agent, Forwarding Agent
4. Supplier
5. Market Surveyor
6. Commission Agent
7. Transporter
8. Warehouse Owner
9. Accounts Writer
10. Security Supplier
11. Courier Services
12. House Keeping Agency

Std. XI

Paper I: Purchase Management (H4)
Theory

Periods

Topic No. 1: Market Survey **30**

Purchase: Term
Meaning of market
Demand, Supply and Price in the market
Classification of Materials: Consumable & Non Consumable, Industrial Products & House Hold Products
Sales Network, Dealers Network
Selection of team of market survey
Selection of location of market
e-Survey
Drafting of Questionnaire

Topic No. 2: Purchase Data **10**

Meaning of Purchase Data
Collection of information of various sources of Supplies
Quality of Goods: Explanation
Tender & its types, such as e-tender, open tender

Topic No. 3: Vendor Selection & Negotiation **16**

Need of comparison in between various suppliers, e search of supplier
Negotiation on Terms & Conditions, Vendor Selection on the basis of supply schedule, services rendered, financial capacity etc.
Price: Its role in purchasing
Types of Prices

Topic No. 4: Purchase Budget & Purchase Order **20**

Meaning & need of Purchase Budget
Methods of Purchasing, Purchasing through internet (e-purchasing)
Purchase procedure & Purchase Order
Procedure of Sending Purchase Order
Follow up of Purchase Order

Topic No. 5: Receipt & Storing of Materials **36**

Receipt: Explanation of term 'receipt of material,' it's procedure
Inspection: Explanation of Inspection of goods (quality and quantity).
Inspection Procedure, rejection of material
Storing of Goods: Explanation, Binning, Placing & Indexing of Materials
Issue of Materials: meaning, Procedure.
LIFO, FIFO Systems: advantages, disadvantages

Topic No. 6: Computer **08**

Meaning, Need & Importance of computer.
Computer language

Practical

Periods

Topic No. 1: Market Survey **50**

Purchase Organization chart
Chart on types of Market
Demand and Supply Curve – Individual and market curve with examples
List of Classification of Materials
Consumable & Non Consumable material: At least 20 each
Industrial Products & House Hold Products: At least 20 each
Chart on channel of distribution & Networks
e-Survey, Market survey with the help of advertisements in news paper & trade magazines
Role playing game on selection of team of market survey
Actual market survey of Food, Cloth, Stationery, Electronic goods, Electrical goods market. Report writing on market survey.
Preparation & filling of questionnaire

Topic No. 2: Purchase Data **36**

Tabulation of Information Collected
Proforma of Purchase Requisition slip
e-Requisition
Proforma of Inquiry Letter
Proforma of Quotation, e-tender, open tender
Tender opening procedure
Procurement Cost: Its elements and calculation of procurement cost with the help of simple example.

Topic No. 3: Vendor Selection & Negotiation **24**

Item wise list of vendors, Preparation of Comparative Statement, e-search for supplier.
Mock discussion between group of at least 5 students on negotiations on Term & Conditions, Group discussion may based on purchase of stationery, consumable items, household items etc.
Flow chart on supply of raw materials.
Computation of Purchase Price with suitable illustration. Explanation of Purchase price, freight, taxes etc.

Topic No. 4: Purchase Budget & Purchase Order **30**

Types of Budget, its forms, Purchase Budget, its proforma
Proforma of Purchase Order
Sending of Purchase Order by e-mail, Purchasing through internet (e-purchasing)
Preparation of Purchase Order of own College for Stationery, Journals and Papers etc.
Follow up Letter of Purchase Order with illustration

Topic No. 5: Receipt & Storing of Materials **72**

Preparation of Materials Receipt Book, GRN, Daily Receipt Voucher
Preparation of Damage / Shortage/Excess Report
Instruments used in Inspection Procedure, Rejection Note
Proforma of Bin Card
Proforma & Preparation of Store Ledger: Examples on LIFO & FIFO
Other documents used in Issue Procedure

Topic No. 6: Computer **28**

Introduction to Word, Excel, PowerPoint
Preparation of letter in Word
Preparation of mark sheet in Excel
Preparation of slides in PowerPoint i.e. PPT
Preparation of PPT slide on information of college.

Paper II: Logistics and Warehousing (H5)

Theory

Periods

Topic No. 1: Road Transport **20**

Road Transport – Introduction, Characteristics
Advantages and limitations of road transport.
Introduction to Ideal Journey Planning, Delivery Planning (Part / Wholesale Delivery), calculation of journey expenditure & duration. Procedure of forwarding and receiving material, procedure of booking of a parcel.

Topic No. 2: Rail Transport **16**

Rail Transport – Introduction, Characteristics, classification of rails
Advantages and limitations of rail transport.
Procedure of booking of a parcel

Topic No. 3: Air & Water Transport **30**

Air Transport: Introduction, Characteristics
Advantages and limitations of air transport

Procedure of booking of a parcel in domestic / international flights
Water transport: Introduction, means used in water transport
Advantages and limitations of water transport.
Procedure of booking of a parcel in water transport
Import Export Duty: Introduction
Other expenses incurred on Dockyard

Topic No. 4: Warehousing **14**

Meaning, Importance
Functions of warehouse
Preservation of goods: meaning, importance

Topic No. 5: Insurance **16**

Introduction to Insurance
Need & Importance of Insurance.
Life Insurance: Meaning, Importance, Principles
Fire Insurance: Meaning, Importance, Principles
Marine Insurance: Meaning, Importance
Transit Insurance: Meaning, Importance
Settlement of claim and damages in respect of each insurance
Medi-claim Insurance: Introduction, importance.

Topic No. 6: Human Resource Management **24**

Labour Contract: Explanation
Labour Act, Labour Contract: Primary knowledge
Maintaining relations with labourers and Industries
Procedure of supplying of labours and solving labour's disputes.

Practical

Periods

Topic No. 1: Road Transport **36**

Road Transport: Introduction.
Chart on type of and means used in Road Transport
Documents used in Road Transport such as L.R., G.R.N., Builty
Examples on Calculation of Journey Expenditure
Receipt Procedure & Packing conditions of dispatching the goods.
Procedure of Payments, Toll Tax, Hamali through study visit. Report writing.

Topic No. 2: Rail Transport 30

Rail Transport: Introduction.
Procedure of sending a parcel through railway
Documents used in Rail Transport: RR, GRN, Delivery Challan
Chart on rates of parcels
Packing, Labeling, marking on parcel
Visit to Roadline Transport Co., MSRTC Office

Topic No. 3: Air & Water Transport 60

Air Transport: Introduction
Chart on air transport: domestic / international flights
Documents used in Air Transport, Air Consignment Note, GRN, Delivery Challan
Chart on fare rates of parcels: domestic / international flights
Packing, labeling, marking on parcel
Water Transport: Introduction, chart on water transport (Inland & International)
Documents used in Water Transport, Bill of Lading, GRN, Delivery Challan
Chart on rates of parcels & import export duty calculation
Packing, labeling, marking on parcel

Topic No. 4: Warehousing 30

Types of Ware House
Procedure of keeping material in warehouse
Proforma of Warehouse Receipt
Procedure adopted in fixing of gradation and standardization of goods
Rates of Private & Public Warehouse
Preservation methods of common articles in a warehouse / Store (Perishable / Non Perishable / Chemical / Rubber etc)

Topic No. 5: Insurance 40

Procedure of getting Life Insurance Policy
Types of life insurance policies, with its features
Procedure of getting Fire Insurance Policy
Types of fire insurance policies, with its features
Procedure of getting Marine Insurance Policy
Types of marine insurance policies, with its features
Procedure of getting Transit Insurance Policy
Types of transit Insurance policies, with its features
Documents used in settlement of claim
Procedure of getting medi-claim Insurance Policy
Types of medi-claim insurance policies with its features

Topic No. 6: Human Resource Management 44

Procedure of Registration of labour contract.
Procedure of obtaining license for labour contract.
Maintaining of labour muster and labour record.
Examples on labour disputes and solutions thereon.

Paper III: Banking and Accounting (H6)
Theory

Periods

Topic No. 1: Banking **24**

Bank: Introduction to banking business
Definition, Need & Importance of bank
Functions and types of banks
Types of bank accounts, deposits & loans
Cheque: meaning, importance, care taken while writing a cheque.
Dishonour of a cheque
Debit Card, Credit Card
ATM, Net Banking (e-banking)

Topic No. 2: Postal Services **10**

Meaning, need & importance of postal services
Speed Post
Courier services

Topic No. 3: Book Keeping **16**

Introduction to Account Writing System
Meaning, Objectives, Importance of Book keeping
Utility of book keeping
Various terms used in Double Entry Book Keeping
Classification of Account, rules of A/cs.
Journal: Meaning, Definition, Importance

Topic No. 4: Ledger **18**

Ledger: Meaning, definition, Importance, Objectives
Proforma of Ledger, ledger posting procedure
Closing & Balancing of Ledger

Topic No. 5: Subsidiary Books & Trial Balance **12**

Subsidiary Books – Introduction
Cash Book – Introduction
Preparation of Trial Balance

Topic No. 6: Final Account **40**

Final A/c: Introduction, Importance
Trading A/c, Profit & Loss A/c, Balance Sheet: Introduction
Preparation of Final A/c: Introduction

Practical

Periods

Topic No. 1: Banking — 40

Bank account opening procedure
Fill up of Bank A/c opening form
Fill up of pay in slip, demo of withdrawal slip
Specimen of Pass Book with illustration
Fill up of cheque, types of cheque
Specimen & fill up of Bank Draft form, Loan form. Preparation of dummy loan proposal
Procedure of operation of Debit card, Credit Card. Demo of Debit & Credit card
Visit to ATM Center, bank
Net Banking procedure (e-banking)

Topic No. 2: Postal Services — 24

Various services rendered by post department
Register Parcel & Letter, VPP, e-mo, Insured Parcel & Letter, MMO.
Procedure of making e-mo, its charges
Procedure of making speed post, courier.
Comparison between speed post & Courier
Study Visit to Post Office, Chart on Postal Rates

Topic No. 3: Book Keeping — 30

Introduction to Account Writing System
Proforma of Journal
Examples on Journal

Topic No. 4: Ledger — 30

Proforma of Ledger, ledger posting
Examples on ledger
Closing & Balancing of Ledger

Topic No. 5: Subsidiary Books & Trial Balance — 30

Subsidiary Books – Proforma & examples
Cash Book proforma & examples
Preparation of Trial Balance with examples

Topic No. 6: Final Account — 86

Final A/c: Introduction
Proforma of Trading A/c, Profit & Loss A/c, Balance Sheet
Examples of Final A/c

Std. XII
Paper I: Retail Management (H4)
Theory

Periods

Topic No. 1: Retail Organization **26**

Retail Organizational Structure: Nature, Functions
Factors influencing environmental and cultural changes
Market Information System (MIS): Meaning, Importance & Objectives
Research Methods for retail business: Purpose & Types

Topic No. 2: Retail Strategy **24**

Meaning, Importance of Retail Strategy
Components of manufacturers Retail strategy, Situation analysis of Retail Strategy
SWOT Analysis: Introduction
Retailing Mix Variable: Meaning, Implementation of Techniques
Indian Retail Business: Meaning, Scope, Skills required for Retail Business
Classification of Retail Business

Topic No. 3: Consumer Behaviour **20**

Consumer Behaviour: Meaning, Need for studying Consumer Behaviour
Various forms of consumer behaviour
Consumers Purchasing Decision: Meaning
Brand differentiation: Its role in buying behaviour

Topic No. 4: Inventory Management **24**

Meaning, Importance, Necessity, Advantages of Inventory
Planning of Inventory Methods of Inventory in Retail Business: Explanation
Inventory Management: Meaning, Importance
Inventory Supervisor: Definition, Role

Topic No. 5: Inventory Control **26**

Meaning of concept Inventory Control
Importance, Need of Inventory Control
Inv. Control Supervisor: Definition, Role
Store Accounting: Meaning, Importance, Methods of Sock Recording
Inv. Maintenance: Meaning, Benefits

Practical

Periods

Topic No. 1: Retail Organization — 50

Preparation of Retail Organizational Structure
Types of Retail Organizational Structure
Analysis of factors influencing RO Structure
Examples, Charts and PPT on RO Structure
Components of Marketing Information System (MIS)
Procedure followed in market research in retail business
Analysis of retail manager's decision making process
Selection of suitable research method in retail business

Topic No. 2: Retail Strategy — 48

Determinants of developing research strategy for satisfying the customers: Explanation
Identify the explanation of components of manufacturer's retail strategy
Procedure for selection of best component
SWOT Analysis
Strategy for implementation of decision taken
Chart/graph on growing scope of Indian retail market
Chart/graph on growing opportunities in Indian retail market
Chart on list of retail business with their investments

Topic No. 3: Consumer Behaviour — 38

Types of consumer behaviour
Techniques applied for consumer behaviour
Factors influencing on consumer behaviour
Factors influencing on Consumers purchasing decision
List of various brands in various sectors as a case study

Topic No. 4: Inventory Management — 50

Types and classification of inventory on the basis of usage, value, volume
Chart preparation on classification of Inventory
Procedure of Inventory
Difference between merchandise inventory and manufacturing inventory
Evaluation of inventory planning
Examples of methods of inventory
Inventory management: Objectives
Inventory Supervisor: Duties, Responsibilities and Functions

Topic No. 5: Inventory Control — 54

Introduction
Steps involved in inventory control
Methods of inventory control

Merits and Demerits of documents used in inventory control
Inventory Control Supervisor: Duties & Responsibilities
Various methods of store accounting
Procedure of store accounting: LIFO, FIFO
Simple examples on LIFO, FIFO
Posting of inventory in accounting

Paper II: Security and Safety Equipments (H5)

Theory

Periods

Topic No. 1: Security and Safety Equipments **26**

Security: Meaning, Objectives
Security points in retail stores
Safety rules: Introduction
Safety Equipments: Meaning, Advantages, Need of safety equipments and Surveillance equipments
Security Guard: Definition, Role and Functions
Work Ethics and Values: Meaning, Explanation
Explanation of work based on intrinsic values
Interaction with customers: Skills and qualities needed
Language used for interacting with customers (Positive, Firmness)

Topic No. 2: House Keeping **32**

Housekeeping: Meaning, Need of Housekeeping
Places where Housekeeping is needed
Procedure of Housekeeping, Housekeeping Policies
Skills and competencies required in housekeeping
House Keeping results, Material handling process in H. Keeping
Fixation of Standards for cleanliness and safety
Waste Management: Sweeping, Mopping, Dusting
Waste Recycle: Meaning
Housekeeping supervisor: Definition, Functions, Importance

Topic No. 3: Display of Product **14**

Display of Products in retail store: Introduction
Techniques and Methods for displaying of product
Quality of product: Meaning, importance of quality.
Inspection of quality - meaning, objectives of inspection of quality,
Price of product: Introduction.

Topic No. 4: Customer needs and Delivery of product **32**

Establishing customer needs: Customer: Definition, Types
Facilities provided to customers
Information assistance to customers

Observation of customer behaviour
Preferences of customers
Customers Counselling, Developing Customer Information System
Delivery of products: Meaning, Planning of efficient delivery
Safety measures to protect from damages while loading/unloading
Transportation of goods
Record keeping of delivery of goods
Cleaning of store area: Necessity, Disposing of waste and slurry: Meaning & Brief Explanation

Topic No. 5: Communication and Sales Supervisor **16**

Interpersonal communication
Effective oral communication: Meaning
Effects of oral communication
Difference between hearing and listening
Maintenance of record
Regulations and policies to be followed in communication
Sales Supervisor: Definition, Role, Importance
Qualities of Sales Supervisor

Practical

Periods

Topic No. 1: Security and Safety Equipments **62**

Security: Location points
Analysis of multi utility of security points in retail store
Safety rules and regulations
Safety and surveillance equipments – their working procedure
Comparison between various safety equipments
Comparison between various surveillance equipments
Security Guard and Supervisor: Types and eligibility required
Differentiate roles & functions of various security guards in different departments of retail store.
Work Ethics and values: Introduction
Difference between duty and work ethics
Evaluation of work ethics through success
Difference between Independent work and Team work
Difference between attitude and behaviour within the office

Topic No. 2: House Keeping **68**

Housekeeping: Equipments used
Functions and Operation of Housekeeping equipment
Outcome of right housekeeping equipment
List of chemicals used in housekeeping
Working techniques used in housekeeping
Outcome of effective housekeeping

Problems occurring in housekeeping, with solutions
Maintenance and care of housekeeping equipments in work area
Difference between safety and housekeeping equipments
Difference between hazardous & non- hazardous housekeeping equipments
Evaluation of work done in housekeeping and cleanliness
Housekeeping supervisor: Role, Duties and Responsibilities
Responsibilities in waste recycling

Topic No. 3: Display of Product **26**

Stock display area: Cleanliness methods used
Attractiveness of display area
Life of product: List of products according to their shell life
Placing of products in display area
Rotation of stock displayed
Accuracy in coding, ticketing
Quality of Product: Introduction
Inspection of product: methods used, equipments used in Inspection procedure.
Computation of price, comparison between various prices.

Topic No. 4: Customer Needs and Delivery of Product **50**

Customer: Introduction
Choices of customers
Movement of customer in retail store
Helping customers in selecting various products
Customer queries and solutions
Confirmation with customers about selection, packing, prices, billing etc.
Type of delivery of products
Stages involved in loading/unloading, delivery and un-delivery of product
Different methods of cleaning of store area
Use of safe procedure in cleaning process
Problem Identification, Method of disposal of waste and slurry

Topic No. 5: Communication and Sales Supervisor **34**

Different equipments used in communication
Care taken to keep communication equipments in working condition.
How to interpret and act upon instructions, accurately?
Documents used in recording
How to deal with customers in respectful, helpful and professional manner?
Roles and responsibilities of different people working with you
Sales Supervisor: Functions, Duties and Responsibilities

Paper III: Supply Chain Management (H6)
Theory

Periods

Topic No. 1: Supply Chain Management (SCM) **28**

Introduction to concept SCM and physical distribution
Importance, advantages, necessity, limitations to SCM
Seven Principles of SCM: Explanation
Five basic components in process of SCM
Direct, Indirect distribution: Introduction

Topic No. 2: Intermediaries in SCM **18**

Meaning, Information of intermediaries
Channel of distribution: Meaning
Channel of distribution for Industrial goods
Channel of distribution for Consumer goods
Channel of distribution in service industries

Topic No. 3: e-Retailing **16**

Meaning, Definition, Importance, Objects
Information and Communication Technology (ICT): Meaning, Importance
Comparison between traditional marketing and e-retailing
e-Marketing: Meaning, Importance, Objectives
Comparison between traditional marketing and e-marketing

Topic No. 4: Tele Marketing **18**

Meaning**,** Objectives, Categories
Telemarketing technology: Introduction
Buyer to Buyer (B2B): Explanation of process.
Buyer To Consumer (B2C): Explanation of process.
Internet business: Meaning, Objectives, Importance
Internet business subset
Enterprise communication and collaboration: Introduction
e-commerce system
Issues involved in internet business
Classification of issues in respect to security, privacy etc.
Career Development: Meaning, Importance, job opportunities

Topic No. 5: Tally Operation **40**

Meaning, Objectives and Importance

Practical

Periods

Topic No. 1: Supply Chain Management (SCM) **60**

Steps involved in SCM & physical distribution
Classification of logistic in SCM
Steps and process of SCM
Scrutiny of seven principles
Practice of each step involved in SCM
Study visit and group discussion on each component involved in SCM
Factors influencing in direct and indirect distribution

Topic No. 2: Intermediaries in SCM **30**

Types and Role
Chart on Channel of distribution for Industrial goods
Chart on Channel of distribution for consumer goods
Chart on Channel of distribution of service industries
Role playing game on Intermediaries

Topic No. 3: e-Retailing **30**

Introduction
Advantages and Disadvantages
List of resources for e-retailing
Information and Communication Technology (ICT): Introduction
Role of ICT in e-retailing
Factors responsible for success of e-retailing
Steps involved in traditional marketing and e-retailing
Practice of e-retailing activity
Discussion on traditional marketing & e-marketing
Steps involved in traditional marketing and e-marketing.

Topic No. 4: Tele Marketing **40**

Introduction
Merits, Demerits
List of telemarketing technology
Demonstration of telemarketing
Steps involved in B2B
Steps involved in B2C
Internet Business (IB): Introduction
Express internal business systems as IB subset

Examine Enterprise communication and collaboration
Significance of e-commerce in e-retailing process
e-commerce system: Introduction
Problems in IB, solutions on issues in respect to security and privacy
Career Development: Stages of career development, its analysis
on the basis of crucial situation
Job opportunities in housekeeping business in SCM, e-marketing

Topic No. 5: Tally Operation 80

Actual Operation of Tally

4. BANKING, FINANCIAL SERVICES AND INSURANCE
(H7, H8, H9)
SCHEME OF EXAMINATION
Std. XI

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	Oral	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	FUNDAMENTALS OF ACCOUNTING	80	3	80	3	10	10	10	10	200	100
2	FUNDAMENTALS OF BANKING AND FINANCE	80	3	80	3	10	10	10	10	200	100
3	LIFE INSURANCE	80	3	80	3	10	10	10	10	200	100

Std. XII

Paper	Title of the Paper	Theory		Practical		Term work	Project work	Visits	OJT	Total Marks	Average
		Marks	Time (Hrs)	Marks	Time (Hrs)						Marks
1	ADVANCED ACCOUNTING AND COMPUTER APPLICATION	80	3	80	3	10	10	10	10	200	100
2	BANKING SERVICES AND CAPITAL MARKETS	80	3	80	3	10	10	10	10	200	100
3	GENERAL INSURANCE	80	3	80	3	10	10	10	10	200	100

*OJT: ON THE JOB TRAINING

Introduction

Banks play a very important role in improvement of the Economy. Indian Economy has been undergoing rapid changes in the area of the Globalization and information Technology.

As an introduction course, it will equip the students to gain knowledge and acquire skill in banking sector. This course will help the students to focus on Bank Accounting, Loan operation, services rendered by Bank, Business Finance, Capital Market and Insurance. This course will enable student to start his business, Seek employment in Banking, Share Market, and Insurance Industry.

This course aims to provide skills in Banking, Financial services and Insurance sector. Capability development and learning outcome, this course will equip the student to:

Objectives

1) To acquire theoretical knowledge of Banking, Financial Services and Insurance
2) Gain practical Knowledge
3) Develop Numerical and analytical Skills
4) Perform multiple task accurately within time limits
5) Develop inter personal skills and maintain relationship with customer
6) Marketing of Insurance and financial product
7) Inculcating and developing saving habits
8) Making layman bankable increasing his credit worthiness
9) Spreading Awareness regarding different types of Insurance and bring out its needs and benefit
10) Help the public to invest their saving for improving their financial growth

JOB OPPORTUNITES

A) Wage Employment

1) Clerk in co-operative Bank
2) Clerk in co-operative Credit Societies
3) Clerk in Commercial Bank
4) Cashier
5) Clerk/Office Assistants in a Investments Firm
6) Daily Reports Collection Agent
7) Manager in Co operative, Housing Society
8) Clerk in a Foreign Exchange/ Export Import Firm
9) Insurance Agent
10) Survey Agent

B) Self Employment

1) Computer Operator
2) Insurance Agent Assistant
3) Loan Recovery Agent
4) Mutual Fund Adviser
5) Share Broker
6) Account Assistance

Std. XI
Paper I: Fundamentals of Accounting (H7)
Theory

Periods

Topic No. 1: Introduction of Book-Keeping and Accountancy 15

1) Meaning and Definition, Objectives, Importance and Utility, Difference between book-keeping and Accountancy, Basics of Accounting – Cash Basis and Accrual Basis, Qualitative characteristics of Accounting information, Financial Accounting, Cost accounting, Management Accounting.
2) Basic Accounting Terminologies, Business Transaction – Cash Transaction and credit transaction, goods, profit, loss, Operating and Non operating profits, normal gains and abnormal gains with examples. Assets, liabilities, net worth / owners equity, Assets - Fixed / Current / Tangible / Intangible / Fictitious, Contingent liability, Capital, Drawings, Debtors, Creditors, Expenditure and Income, Cash Discount and Trade Discount, Solvent and Insolvent, Accounting year, Trading, Concerns, and 'Not for profit' Concerns, Goodwill, Conventions and principles and Indian Accounting Standards Concepts and objectives-Meaning and Importance, Business entity, money measurement, cost, consistency, conservation, going concern, Realization Accrual, Dual Aspect, Disclosure, Materiality, Revenue, Accounting Standards.

Topic No. 2: Meaning and Fundamentals of Double Entry Book-Keeping System 14

1) Study of Double Entry Book-Keeping System, Advantages of Double entry Book-keeping system, Comparison of Double Entry Book keeping system with Conventional Accounting System, Classification of Accounts and Accounting Equation, Rules, Type of Accounts – Personal, Impersonal Accounts – Real accounts, Nominal accounts, Rules for different accounts for passing entries, illustrations, Accounting equations, Assets, Liabilities, Revenue and capital expenses, Brief explanation about IFRS (International Financial Report Standard)

Topic No. 3: Source Documents required for Accounting 06

1) Meaning, contents and prepare format -
2) Voucher – Internal & External vouchers, Petty cash and Cash Voucher, Cash Memo, Receipts, Debit and Credit Note, Pay-in-slip, Withdrawal slip, Cheque – Bearer, Order, Crossed, Account Payee, Bank Pass Book, Banks Statements and Bank Advice.

Topic No. 4: Journal and Subsidiary Book 25

1) Journal – Meaning, Importance and utility of journal, Prepare format of Journal, writing of journal entries, Subsidiary books - Meaning, need, Prepare format of

different subsidiary books, simple cash book with Cash column only, Analytical petty cash book – Imprest system, Cash book with cash and bank column, Three column Cash book, Cash, Bank and Discount column, Purchases book, Sales book, Purchase Return book, Sales Return book, Journal proper, transactions of discounts, to be taken in Journal proper.

Topic No. 5: Ledger **15**

1) Meaning, Need and contents of ledger be explained, Prepare format of ledger, posting entries from subsidiary books to ledger, balancing of ledger accounts.

Topic No. 6: Bank Reconciliation Statement **10**

1) Meaning, Need and importance, Reasons for difference in bank balance as per cash book and balance as per bank pass book, format of bank reconciliation statement.

Topic No. 7: Trial Balance **05**

1) Meaning and purpose, Format of trial balance, preparations of trial balance from given balance of accounts.

Topic No. 8: Errors and their Rectification **10**

1) Meaning and effects of errors, types of errors – Errors of principle, Errors of Omission, Errors of Commission and Compensating errors, steps to locate errors, errors affecting and not affecting trial balance, Rectification entries.

Topic No. 9: Final accounts of Sole Proprietary Concern **20**

1) Financial statements – Meaning, objective and importance, Preparation of Trading accounts, Preparation of profit and loss accounts and balance sheet, Effect of following adjustments – Closing stock, depreciation, Bad and doubtful debts, provision for discount on debtors and creditors, outstanding expenses, pre-paid expenses, Accrued Income, Income received in advance, drawing / addition of Capital, Goods distributed as free Samples.

Practical

Periods

Topic No. 1: Introduction of Book-Keeping and Accountancy **15**

Topic No. 2: Meaning and fundamentals of Double Entry Book – Keeping system **15**

Topic No. 3: Source Documents required for Accounting 30

1) Prepare format of Cash Memo, Receipt, Bills, Invoice, Journal Vouchers, Cheque, Bank, Draft etc. Prepare debit vouchers, Credit Vouchers, Prepare format of pay-in-slip, withdrawal slip, Bearer Cheque, Crossed Cheque, Account Payee Cheque, Bank Passbook, Bank advice, Bank statement, write the names of various Assets and liabilities, Income and expenditure items, classification of accounts – i.e. Personal, Real, Nominal and write the names of items in each heads. Analysis of business transactions according to the rule of journalisation (Golden Rule of Accounting)
2) Prepare the chart showing the rules of Debit and Credit

Topic No. 4: Journal and Subsidiary Books 30

1) Prepare format of Journal, writing of journal with support of vouchers and invoice, Format of Subsidiary books, Preparation of Simple Cash Book, Double column Cash book (Cash and Bank Column), Three column Cash book, (Cash, Bank and Discount Column), Preparation of Analytical petty cash book on imprest System, Preparation of purchase book, Sales Book, Purchase Return Book, Sales Return Book and Journal proper.

Topic No. 5: Ledger 30

1) Prepare format of ledger, steps to be taken for preparation of ledger, Ledger posting and Balancing of Ledger accounts, Posting of entries from Subsidiary books to ledger accounts.

Topic No. 6: Bank Reconciliation Statement 30

1) Prepare format of Bank Reconciliation Statement, Prepare the specimen of Bank Reconciliation Statement as per cash book balance i.e. Normal balance and Overdraft balance, and Prepare the Bank Reconciliation Statement as per Bank Pass book balance i.e. Normal balance and over draft balance, Method to ascertain items to be added to and deducted from the balance of Cash book/ Bank Pass Book, Problems for Practice.

Topic No. 7: Trial Balance 20

1) Prepare format of Trial Balance i.e. Journal Form and Ledger Form, Guidelines to prepare Trial balance, Preparation of trial balance in Journal Form and Ledger Form, Practical Problems (with Suspense Account also)

Topic No. 8: Errors and their Rectification 20

1) Steps to locate accounting errors, Rectification entries (With and without suspense account), Problems for Practice

Topic No. 9: Final Account of Sole Proprietary Concern **50**

1) Format of trading accounts, profit & loss and balance sheet (with and without adjustment given in the theory paper), solving problems of Final accounts

Field Visit / Project / Guest Lectures / Journal / On Job training.

Paper II: Fundamentals of Banking and Finance (H8)

Theory

Periods

Topic No. 1: The nature, meaning, structure and scope of Banker: **10**

1) Nature, Meaning, Definition, Scope of banker and structure of Banking in India, Functions of a Banker, Types of Banks – Public Bank, Private Bank, RBI, Foreign Bank, Co-operative Bank, Postal Bank, Agricultural Bank, Co-op Credit Societies – Meaning and Importance, Retail banking – Meaning & Importance, Functions. Core Banking – Meaning & Process.

Topic No. 2: Saving Bank and Current Account: **15**

1) Saving bank account – Meaning and importance of SB Account, Types of Account Holders – Individual, Joint, Minor. Steps for opening of Savings Bank Account, Nomination, KYC norms and brief knowledge of documents required. Meaning and Importance of Current Account, Types of current account – Sole Proprietor, Partnership, Joint Stock Company, Club, Non Profit organizations account. Distinguishing features of Current Account, Overdraft facility, Definition of a cheque, parties and types of Cheque, Crossing of cheques – Need, meaning and Types, Stop payment order-meaning and precautions, Standing Instructions.

Topic No. 3: Fixed / Recurring Deposit Account **10**

1) Meaning and importance of Term Deposit, Types of fixed deposit Account, Procedure of opening fixed and Recurring deposit account, Procedure of renewal of F.D., Repayment of Term Deposit (F.D) on Due date with interest, Concept of Indemnity Bond.

Topic No. 4: Transfer and Closing of Bank Account **10**

1) Meaning, rule and Procedure of transfer entries, Meaning of Bank charges, Standing instructions, Recording of Bank charges, Meaning of Inoperative account, Scrutiny of Inoperative and Dormant accounts, Closing of Bank accounts – Meaning and steps, Brief Knowledge about Death Certificate, Succession Certificate, Will, Probate and Court Order.

Topic No. 5: Receiving & Paying Cashier **10**

1) Meaning and their importance, Duties of Receiving and Paying Cashier, Procedure followed for Receiving cash from Depositors and others, Procedure for passing cheques, Draft & Pay order, Token & its importance, Teller system, Clean Note Policy.

Topic No. 6: Deposit Mobilization **20**

1) Meaning of Deposit Mobilization, Importance, prospecting sales Channel, Negotiation and Need Assessment, Closing (Striking a Deal), Introduction to Services.

Topic No. 7: Business Finance and Functions of Financial Management **15**

1) Meaning and objectives of Finance, Profit Maximization, Wealth Maximization and other General Objectives, Scope, Role and Functions of Financial Management –
   a. Routine Functions
   b. Executive Functions –
      i. Estimating Capital Requirement
      ii. Mobilization of Funds
      iii. Investment Decisions
      iv. Allocating surplus
      v. Evaluating Financial Performance
      vi. Dividend Policy
      vii. Advising Board of Directors

Topic No. 8: Financial Planning **15**

1) Introduction, Importance of financial planning, Advantages and Limitations of Financial planning, Types of financial planning, Fixed Capital and Working Capital.

Topic No. 9: Financial Sources of Business **15**

1) Meaning and Importance of Business Finance, Sources of Business Finance – Internal and External Sources of Funds, Short Term – Cash Credit and Overdraft, Advances from dealers & customers, Trade Credit from Suppliers, Factoring of Account receivables, Discounting of Bill of Exchange, Issue of Commercial paper.
2) Long Term – Issue of Shares, Issue of Debentures and Bond's, Long Term Loans from Banks, Retained Earnings, Public Deposits, Venture Capital and Lease Financing.

Practical

Periods

Topic No. 1: The nature, meaning, structure and scope of Banker **20**

1) Prepare a chart of structure of Banks in India, Collect information from reference material and compile, Prepare a chart showing structure of Co-operative Credit society.

Topic No. 2: Saving Bank and Current Account 30

1) Saving Bank account – Collect information of banks and facilities offered in your area & compile, Collect Account Opening forms / Brochures, Pay-in-slips, withdrawal slip-Fill and File, Students should open an SB A/c in their own name in a Bank or Credit Society and operate. Prepare a template of a cheque and cross it, Prepare a format of a Pass book using extracts and pass entries in Pass book and solve problems, Issue of Duplicate Pass Book Procedure, Draw Format of a Requisition Slip to obtain a new cheque book.
2) Current Account & its Operation:
   Understand the requirements for opening current account and documents, Prepare format of KYC form and Fill it, Steps & Account Opening Procedure, Project on Current Account.

Topic No. 3: Fixed & Recurring Deposit Account 20

1) Collect brochures & compare interest rates offered by Banks, Ask the students to open FD / RD A/c in their own name in a Bank or Credit Society, Prepare format of FDR, Project on Fixed Deposit Account, Change in names, Payment before due date, Loss of FDR, Loan against FDR (give examples) Collect RD pay in Slip and Fill it, Format of R.D. account Pass Book.

Topic No. 4: Transfer and closing of Bank Account 20

1) Prepare Debit Voucher, Credit Voucher, Posting of Voucher, Visit the nearest bank and list the bank charges on various bank services, Prepare a table of Bank charges, Collect brochures from Bank, Procedure of closing saving and current account, Procedure of transfer of account from one Branch to another Branch, Write the procedure of closing the deceased persons account and transfer of fund to the legal heirs.

Topic No. 5: Receiving and Paying Cashier 30

1) Format of Pay –in-slip of S.B. Account, Current Account, R.D. a/c, F.D. a/c, Ask the student to collect information about the counterfeit coins & Forged Notes / Fake Notes & distinguish them with genuine notes & coins, How to spot a Fake Currency. Stamping & Signing of Pay-in-slip, Preparation of Receiving Cashier's Register, Scroll Registers, Study & Draw different seals used, Preparation of cash receipt issued by Head Cashier to Receiving Cashier, Note Counting Machine & its use, Arrangement of Receiving Cashiers Cabin & Paying Cashiers Cabin & Safety Precautions, Documentation of payment of cash, Preparation of cash receipt issued while withdrawing cash from the strong room, format of Register kept at strong room and the entries recorded, Preparation of Token, Prepare format of draft, pay order & its Application Form, Format of Scroll Register, Draft Issue Register, RTGS Application form. Format of Cheque Return Memo

Topic No. 6: Deposit Mobilization 40

1) Survey the area, use of electronic medium (emails, SMS, Phone Calls), Display Charts and Banners, Personal visit (School, Colleges, Housing Societies, offices)

follow-up, Prospecting Sales Channel, Preparing Questionnaire and Interview of Prospective customers.

Topic No. 7: Business Finance & Functions of Financial Management 20

Topic No. 8: Financial Planning 20

Topic No. 9: Financial Sources of Business 40

1) Prepare the chart of sources of Finance, Prepare a chart of capital Structure of a company, Prepare the format of Cash Credit, Bank Overdraft, Application form and fill it with imaginary details, write the procedure of Cash Credit and Bank Overdraft, Procedure of Discounting of Bill of Exchange, Procedure of issue of shares Application & Allotment.
2) Give the procedure of issue of Debentures, Procedure of collecting Deposit by a public limited company, Prepare the format with brief explanation and ask the student to fill it with imaginary details of Share certificate, Debenture Certificate, Dividend Warrant, Interest Warrant, Certificate of Incorporation of Company, Certificate of commencement of Business of a Public Ltd Company, Prepare format of letter of credit, Prepare a financial plan of a Family member.

Journal / Project / Field Visit / O.J.T.

Paper III: Life Insurance (H9)

Theory

Periods

Topic No. 1: Insurance Regulatory Development of Authority (I.R.D.A.) 25

1) Definition and Nature, Role and Importance of I.R.D.A, Insurance: Definition, Need, Role of Insurance in economy, Types of Insurance, Insurance Act 1938 and 1999, Composition of authority, public and private Insurance, Overview Companies Process and Contents, Life Insurance: Meaning and Definition, Need, Importance and scope of Life Insurance, Types of Life Insurance and various plans of Life Insurance, Features of Policies.

Topic No. 2: Group Insurance 10

1) Special Legal Features of Group Insurance, Superannuation scheme, Group Gratuity scheme, Retirement scheme.

Topic No. 3: Micro Insurance and Health Insurance 10

1) Meaning and definition, features and need of Micro Insurance in India
2) Meaning and definition, features and need of Health Insurance.

Topic No. 4: Pension and Ulip Plans 10

1) Meaning and Importance of Pension Plans and Ulip Plans, features and need of Pension Plans and Ulip Plans, Benefits of Pension Plans and Ulip Plans.

Topic No. 5: Underwriting **10**

1) Introduction and meaning of Underwriting, Medical and Non-Medical Underwriting, Underwriting by Agent, Recent Trends, Surrender Value and Paid-up-value, Nomination and Assignment – Meaning, Features, Difference between Nomination and Assignment.

Topic No. 6: Life Insurance Agent **25**

1) Definition of an Agent, the concept of Carrier Agent, Educational Qualifications, Criteria for Appointment of an Agent, Remuneration for the Agent, Qualities and Essential skills to become successful Agent, To Prepare the Application form for the recruitment of an Agent. The Role and Importance of an Agent in Insurance Business.

Topic No. 7: Life Insurance Marketing **20**

1) Introduction, Meaning, Definition and concept of Marketing, distribution channel, The Customer, Strengthen relationship, Advertisement, Customer Satisfaction and Sales Technique, Difference between selling Goods and selling of Insurance Policies (Products) Life Insurance Agent Back Office, Customer Service, Types of Needs Fulfillment, use software packages for Life Insurance.

Topic No. 8: Claim Settlement **10**

1) Introduction, Meaning and concept of Claim settlement, Survival of Policies, Surrender of Policies and Maturity Claim: Meaning, Procedure and Necessary Documents for Maturity Claim, Death Claim: Meaning Procedure and Necessary Documents for Death Claim.

Practical

Periods

Topic No. 1: Insurance Regulatory Development of Authority (I.R.D.A.) **40**

1) Comparative study of Government Insurance companies and private insurance companies, To study the Contents of Proposal Forms, To prepare the charts of Types of Insurance, Visit to two Insurance Companies and Prepare Report.

Topic No. 2: Group Insurance **25**

1) Visit to Insurance Company for gaining practical knowledge about Group Insurance and Submits its report, Visit to Insurance Company for gaining practical knowledge about Superannuation Scheme and submits its report, Group Gratuity Scheme and Retirement Scheme.

Topic No. 3: Micro Insurance and Health Insurance **25**

1) To get filled in five proposal forms of different Insurance Companies
2) To collect necessary documents from concerned prospective clients

Topic No. 4: Pension and Ulip Plans **25**

1) Conduct market survey for gaining the knowledge of pension and Ulip Plans and submits its survey report.

Topic No. 5: Underwriting **25**

1) Calculation of Surrender Value and Paid up Value.
2) To get filled in five proposal forms of different Insurance Companies & to get filled in five Agents Confidential Reports.

Topic No. 6: Life Insurance Agent **30**

1) Visit the Insurance companies and arrange an Interview with the Successful Development Officer and Insurance Agents and get the knowledge about Insurance Agency & submit the report of the Interview

Topic No. 7: Life Insurance Marketing **40**

1) Canvas sale of Insurance policies by explaining various suitable plans to customers, use of skill and selling techniques, Assisting the policy holder and servicing policy, helping the insured in getting their claim properly assessed and settled, Use of software packages for Life Insurance.

Topic No. 8: Claim Settlement **30**

1) Comparative study of the Claim forms of various companies and make comparative statements. Prepare Five Case Studies of Survival & get filled in Five Maturity Claim forms, and Five Death Claim forms.
   Journal / Project / Viva / Field visit / O.J.T.

Std. XII

Paper I: Advanced Accounting & Computer Application (H7)

Theory

Periods

Topic No. 1: Partnership Final Accounts **15**

1) Meaning and Definition, The Indian Partnership Act 1932, Partnership deed, Methods of Capital Accounts, Introduction and necessity of preparation of Final Accounts with following adjustments:-
   a) Closing stock b) Outstanding expenses c) Prepaid expenses d)Income received e) Income receivable in advance f) Bad-debts g) Provision of doubtful debts h)Reserve for discount on debtors and creditors i) Depreciation j) Interest on capital, drawing and loans k)Interest on investments and loans i) Goods destroyed by fire/accident (insured/uninsured) m) Goods stolen n) Goods distributed as free sample o) goods withdrawn by partners p) Unrecorded purchases and sales q) Capital expenditure included in revenue expenses and vice-versa r) Commission/remuneration to working partner on the basis of sales etc.

Topic No. 2: Negotiable Instruments 25

1) Introduction, necessity, Meaning, Definition, Types of Negotiable Instruments, Draft/Format of Bills, Promissory Notes, Parties, Acceptance of Bill, Terms of Bills, Days of Grace, Date of Maturity, Due Date, Types of bills of exchange, Honouring of Bill, Dishonouring of Bill, Noting and protesting of bill, Notary public and noting charges, stages in collection of bill, Accounting treatment of bill by the Drawer/Holder and Drawee in following cases :-

   a) Retaining the bill till due date, honour/dishonour, insolvency of acceptor/drawee, Endorsement of the bill, honour/dishonour and insolvency of acceptor, Discounting the bill with the bank, honour/dishonour and insolvency, Sending the bill to the bank for Collection/Honour/Dishonour and Insolvency, Renewal of Bill-Reasons for renewal of the bill, Renewal of the bill with or without charging interest, making part payment of basic amount, Interest and noting charges and drawing of new bill, Honour/Dishonour of new bill, Journal Entries and Ledger.
2) Average Due Date: - Meaning, Importance, Procedure of calculating Average Due Date and Calculation of Interest.

Topic No. 3: Company Accounts 25

1) Introduction, Capital Structure, Objectives of Financial Statements, Financial Statements-Requirement and Contents, Balance sheet (as per schedule VI-Revised), Scheduled notes to balance sheet (only working knowledge and simple problem of classification of items).
2) Accounting for Shares: - Shares and share capital, Meaning, Nature and Type, Accounting for share capital: - Issue and Allotment of equity shares, over subscription and under subscription of shares, Issue at par, Premium and discount, calls in arrears, Issue of shares for consideration other than cash, Accounting treatment of forfeiture and re-issue, Disclosure of share capital in Company's Balance Sheet (Practical-only journal entry), Issue of shares, forfeiture of shares.
3) Accounting for Debentures: - Meaning and Introduction, Issue of debentures at par, Premium and Discount, Interest on Debentures Redemption of Debentures.
4) Bank Accounts: - Meaning and Importance, Format of Bank's Balance Sheet and Profit and Loss Account (Vertical Format)

Topic No. 4: Analysis of Financial Statement 15

1) Meaning, Objectives and Limitations, Tools for Financial Statement Analysis, Meaning of Comparative Statements, Common size Statements, Cash flow statements, Ratio Analysis:-

   Meaning and Importance, Classifications of Ratios a) Gross profit ratios, b) Net profit ratios, c) Current ratios, d) Liquid/Quick Ratios, e) Debt equity ratio, f) Debtors turnover ratios and credit period, g) Creditors turnover ratios and credit period,

   h) Proprietary Ratio, i) Return on Investments, j) Stock Turnover Ratio.

Topic No. 5: Tax and Preparation of Tax Returns **20**

1) Meaning, Need and Objectives, Different types of Taxes:- a) Income tax (I.T), b) Value Added Tax (V.A.T) c) Service Tax, d)Local Body Tax (LBT), e) Professional Tax (P.T).

Topic No. 6: Computerised Accounting System and Tally ERP-9 **20**

1) Meaning, Components of computerized Accounting System (CAS), Features and Software's of CAS, Tailor Made Software/Ready to use Software.
2) Application of Computer Accounting and Accounting on Tally Package: - How to use computer for processing data software.
3) Kinds of Software's:- Operating system, Application programme, Benefits of Computerised Accounting, Accounting programme, Using package software for accounting, Use of Tally ERP-9, Software for Accounting.
4) Create a Company:- Name, Mailing Name and Address, Income Tax Number, VAT Registration Nos., Maintain Accounts or Inventory, Financial Year from book beginning from, Use of Security Control, Base currency information, Ledger and posting vouchers and its entries.

Practical

Periods

Topic No. 1: Partnership Final Accounts **40**

1) Prepare the format of partner's capital account under fluctuating capital method and fixed capital method, prepare format of partners current account, problems for practice, Prepare format of Trading Accounts, Profit & Loss accounts, Balance sheet (without adjustments) prepare format of trading accounts, Profit & Loss accounts, Balance sheet (with adjustments) Journal Entries (Transfer Entries) for Profit & Loss Accounts, Practical problems covering adjustments stated in the theory.

Topic No. 2: Negotiable Instruments **30**

1) Preparation of various types of Bills of Exchange and promissory note, Calculation of discount and interest, preparation of sales invoice and purchase bill, Problems for practice, explanation of stages in calculations of Average Due Date, Calculation of Interest and Simple problems.

Topic No. 3: Company Accounts **50**

1) Trading, Profit and Loss Accounts and Balance Sheet. Prepare format of Balance Sheet (as per schedule-VI), Simple Problems on classification of items in Balance Sheet.
2) Accounting for Shares
   Prepare format of Share Certificate, Structures of Share Capital, Journal entries of application of shares, Allotment of shares, Issue of shares, Calls on shares, Calls in arrears, Forfeiture and re-issue of shares, Problems for practice (only journal entry).
3) Accounting for Debentures

Prepare format of journal entries for issue of debentures, practical problems (only journal entries)

4) Bank Accounts
   Prepare Format of Bank's profit and Loss Account and Balance Sheet (vertical Format)

Topic No. 4: Analysis of Financial Statements 20

1) Simple problems in connection with comparative statements, common size statements and cash flow statements and ratio analysis stated in the theory.

Topic No. 5: Tax and Preparation of Tax Returns 40

1) Prepare the format and filling up of different tax returns i.e. Income Tax (I.T) Value added tax (V.A.T) Local Body Tax (LBT) Professional Tax (P.T) and Service Tax, Calculation of tax with Imaginary details (simple problems), Arrangement of guest lectures.

Topic No. 6: Computerized Accounting System and Tally ERP-9 60

1) Hands on training in computer- Tally ERP-9 Package, Create a company as per theory.

Paper II: Banking Services & Capital Markets (H8)

Theory

Periods

Topic No. 1: Loans and Advances 15

1) Types and classifications of Advances, Banker-Borrower relationships, Principles of Sound Lending, Personal Finance, Procuring Overdrafts, Cash Credit, Car Loan, Education Loan, Housing Loan, Gold Loan, Personal Loan, Loan against Securities e.g. Life Policies, Fixed Deposit Receipts, NSC's, Kisan Vikas Patra, Bonds, Goods, Supply Bills, Agricultural Loans, Credit card, Kisan Credit Card, Loan for self-employment, Contract of Indemnity & Guarantee. Meaning, Types, Issue of Guarantee and Indemnity.
2) Modes of Creation of Charges-Lien, Assignment, Hypothecation, Pledge, Mortgage their meaning, Features, Precautions and Types.
3) Concept and Meaning of NPA (Non Performing Assets)

Topic No. 2: Customer Services 10

1) **Fund Transfer**: - Bank Draft, Meaning, Procedure of Issue and Encashment of Demand Draft, Online Banking-Meaning, Procedure of IFSC Systems (Indian Financial System Code), RTGS/NEFT
2) **Safe Custody and Safe Deposit Lockers**: - Their Importance/Need, Procedure of Opening, Operating, Closing, Documentation.
3) **Handling Foreign Exchange Transactions**: - Meaning and Importance of Foreign Trade, Bank's role in Foreign Trade, Foreign Exchange and Exchange rates,

NOSTRO & VOSTRO A/Cs-brief knowledge about FEMA, Procedure for sale of Foreign Exchange, Buying and selling rates.

4) **Value Added Service of a Bank**:- Payment of Tax, Income Tax, VAT, LBT, Property Tax, Municipal Tax, Payment of Stamp Duty, Insurance Premium Payment, Medi-claim, Vehicle Insurance, Pension Payment, Payment of Utility Bills, Scholarship Payment.

Topic No. 3: Clearing Department Functions 05

1) Meaning, Importance & Functions of Clearing House, Functions of Clearing Department in a Bank through Computers, ECS, CTS system (Cheque Truncation system)

Topic No. 4: Exchange of Cash and Frauds 05

1) Meaning and Need, Currency notes and Features of Genuine notes, Mutilated and Soiled Currency Notes and Counterfeit Coins, Procedure of Exchange of soiled/mutilated notes & RBI clean note policy.
2) Frauds in a Bank - Meaning and areas, Detection and Prevention, Vigilance

Topic No. 5: Technological Developments in Banking Sector 10

1) Need of Computerization, Phone Banking, Net Banking, E-Banking, ATM, Functions of ATM & Services, Debit Cards & Credit Cards, S.W.I.F.T Network, CTS (Cheque Truncation Systems), Electronic Fund Transfer-RTGS/NEFT, Electronic Data Interchange (EDI), CIBIL (Credit Information Bureau(India) Limited), Website of RBI.

Topic No. 6: Customer Relationship Management 10

1) Introduction, Need in an Organization, Types of CRM, Advantages, Customer Satisfaction.

Topic No. 7: Capital Market 15

1) **Stock Exchange** - Meaning, Role And Function, Bombay Stock Exchange, National Stock Exchange, Trading Procedure, SEBI(Securities and Exchange Board of India) Terms Related to Stock Exchange Transactions, Credit Rating Arrangements.
2) **Mutual Funds** - Meaning, Objectives, Role in the Capital Market, Benefits to the Investors, Constitutions of Mutual Funds, (Sponsors/Promoters), Trustees, Assets Management Company, Custodians (Safe Custody of Fund Securities etc).
3) **Corporate Bonds and Fixed Deposits** - Meaning Need and Importance, Types of Bonds, Deposits.

Topic No. 8: Depository System and De-materialization 05

1) Meaning, Need for Depository, Importance of Depository to Investors and Companies, NSDL (National Securities Depository Ltd.) CSDL (Central Securities Depository Ltd) Procedure for Dematerialization.

Topic No. 9: Research Methodology in Share Market & Investment Strategy of Good Investor **15**

1) Research Methodology, Introduction, Meaning and Objectives of Research, Types of Research.
2) **Investment Strategy of Good Investor in stock Market**-Introduction, Importance, Indian Capital Market, Introduction to the Company, Company's Product Portfolio, Portfolio Analysis, Market Analysis and Market Index, Conclusion and Suggestions.

Topic No. 10: Personal Finance Management **15**

1) Meaning, Need & Importance, Sources of Finance, Strategy, Role of a Personal Finance Manager/Advisor.

Topic No. 11: Back Office Management of a Share Broker, Mutual Fund & How to Become a Sub-Broker/Agent **15**

1) Meaning, Need and Importance, Procedure

Practical

Periods

Topic No. 1: Loans and Advances **20**

1) Three C's for Credit Worthiness (Character, Capital and Capacity).Procedure for Advancing different types of Loans as per theory and Documentation (Documents required for taking loan), Trust Receipt (Prepare Format), Loan Application Form-(Understanding & Interpretation), Preparing a Loan File, Collect Formats of Mortgage, Hypothecation, Lien, Assignment Letters, Application Forms and Documents required to take a credit card and Procedure.

Topic No. 2: Customer Services **25**

1) Write the Procedure for Online Banking, Calculation of Simple & Compound Interest (Quarterly, Half Yearly, Annual) on fixed Deposits, Safe Custody Procedure and Safe Custody Valuable Receipts (Format), Opening and Operation of Safe Deposits Vaults, Agreement of Lockers, Rent Register and Visit register of Safe Vault, Currencies of Different Countries and their exchange rates, Procedure of Sale of Foreign Exchange, Procedure of Purchase of foreign exchange, Procedure of Payment of Value added Services, Arrange a Visit to a Bank and show students Safe Deposit Vaults/Lockers.

Topic No. 3: Clearing Department Functions **15**

1) Prepare format of a CTS cheque and knowledge of CTS system, Clearing, Procedure (Inward and Outward) and Preparation of a Clearing Sheet and balancing it, Project on Clearing System.

Topic No. 4: Exchange of Cash and Frauds **15**

1) How to spot a fake Currency, Procedure of exchange of Soiled Notes, Collect information on notes and coins from Newspaper and RBI Museum and Internet, Project work on "FRAUDS" in a Bank.

Topic No. 5: Technological Developments in Banking Sector **25**

1) Prepare format of ATM card, Procedure of withdrawing cash from ATM, Services available at the ATM, Procedure for Net Banking and Core Banking, Collection of forms of RTGS/NEFT and understand its working, Internet Browsing of Bank Sites.

Topic No. 6: Customer Relationship Management (CRM) **15**

1) Procedure for Redressal of Customer Complaints, Banking Ombudsman Scheme of RBI.

Topic No. 7: Capital Market **30**

1) Procedure of opening De-mat A/c, Collect latest Annual Report of a Company, Arrange a visit to a stock exchange and prepare a visit report or arrange a visit to a share broker's firm or any organization which deals in corporate securities and Prepare a visit report, List the different type of schemes/plan floated by mutual funds, prepare the format of mutual fund application form (any scheme), Collect the guidelines to mutual funds from (SEBI manual from internet), Collect information of various types of bonds issued by the government/corporations & public sector undertaking (PSU), collect information about the various deposits schemes of leading public limited companies and prepare report about it.

Topic No. 8: **Depository System and Dematerialization** **15**

1) Collect the annual report of NSDL & CSDL, Prepare the procedure of opening of De-mat account and procedure of operation of De-mat account.

Topic No. 9: **Research Methodology - In Share Market & Investment Strategy of a good Investor in Stock Market** **30**

1) Collect the annual report of SEBI, collect various information published by Business Magazines and Newspapers about stock market, listen and read comments of experts and their interviews about Stock Market and Securities on TV and Business Magazines etc and comment on it. Study a few Blue Chip Companies share movement in the stock market for at least one week and prepare a chart and comment on it. Arrange Guest Lectures, Arrange a Visit to an organization which deals in Corporate Securities and Write a Report.

Topic No. 10: **Personal Finance Management** **30**

1) Find out various interests rates of different banks like nationalized banks, private banks, co-operative banks, postal banks, arrange interviews of salaried persons, self-employed people like taxi drivers, auto drivers etc. and small businessmen & prepare a report. Prepare personal budget for them, collect various articles related to personal finance management from leading business magazines/newspapers and comment on it, arrange guest lectures.

Topic No. 11: Back Office Management of Share Broker's 20
Mutual fund and How to become a sub broker/agent

1) Collect application form from a share broking firm for sub-broker and fill it with imaginary details. Arrange a visit to share broking firm, give students understanding & practice on share trading & transfer procedure using computer software, make students aware of customer services in share broker's office.

Paper III: General Insurance (H9)

Theory

Periods

Topic No. 1: General Insurance 20

1) Definition and Nature of General Insurance, Role, Scope and Importance of General Insurance, Insurance Contract, Nature of Insurance Contract, its Features, Difference between Insurance Contract and Gambling, Classification of General Insurance, General Insurance Corporation of India, Objectives and Functions of General Insurance Corporation of India.

Topic No. 2: Fire Insurance 20

1) History of Fire Insurance, Definition, Nature and Need of Fire Insurance, Basic Principles applicable to Fire Insurance, Difference between Fire and Life Insurance, Types of Policies, Types of Hazards, Underwriting and claim settlement of Fire Insurance.

Topic No. 3: Marine Insurance 20

1) Introduction to Marine Insurance, Definition, scope, Nature and Importance, Basic Principles, Market structure, Protection and Indemnity Association, Basics of Rating, Types of Policies, Underwriting and claim settlement of Marine Insurance, Institute Clauses, its Meaning and Effect on Policy.

Topic No. 4: Motor Insurance 15

1) Meaning, Importance and Nature of Motor Insurance, Motor Insurance Act-1939, Principles and Practice of Motor Insurance, Physical and Moral Hazard, Classification of Risk, Method of Rating, Extra Benefits and Rebate, Discount, Contingent Liability, Indemnities, Reinsurance, Types of Motor Insurance, Features, Advantages, Classification of Motor Vehicles, Conditions in Policies, Underwriting and Claim.
2) Settlement, Proposal Form, Meaning, Importance, Types, Insurance Certificate, Policy, its Importance, Claim Settlement, Necessary Documents for Settlement Claim, Importance, Investigations, Inspecting the Damages.

Topic No. 5: Accident Insurance and Health Insurance 15

1) History, Meaning, Nature and Scope of Accident Insurance, Legal Aspects Relating to Accident Insurance, Basic Principles Types of Accident Insurance, its features, Personal Accident and Sickness Insurance.

2) Health Insurance: Introduction, Definition, Scope, Nature and Importance of Health Insurance, Types of Health Insurance, Underwriting and claim settlement.
3) Procedure of Health Insurance.

Topic No. 6: **Plant and Machinery Insurance** **10**

1) Meaning, Importance, Nature, Scope, Features of Plant and Machinery Insurance, Underwriting and claim settlement. Procedure of Plant and Machinery Insurance.

Topic No. 7: Miscellaneous Insurance **10**

1) Meaning, Nature, Scope of Miscellaneous Insurance, Burglary Insurance, Employers Liability Insurance, Crop Insurance, Cattle Insurance, Workmen Compensation Insurance, Medi-claim Insurance, Plate Glass Insurance, Contractors Risk Insurance, Third Party Insurance, Difference between Medi-claim Insurance and Health Insurance.

Topic No. 8: Insurance Salesmanship **10**

1) Meaning, Nature of Concept, General Principles of Salesmanship, Sales Techniques, Psychology in Selling, Tips for successful Salesman, Scope for Modern Insurance Business, Scope of Insurance in India, Insurance Needs.

Practical

Periods

Topic No. 1: General Insurance **40**

1) Arrange at least two visits to any General Insurance Company.
2) To understand its working and prepare a report.
3) Prepare two hypothetical Insurance contracts.

Topic No. 2: Fire Insurance **40**

1) Collect the proposal forms of Fire Insurance of Government and Private Insurance Companies and fill it with Imaginary details (Any five establishments) Conduct survey of commercial establishments to measure the risk factor, Valuation of property, calculate the amount of premium for the policy and submit the report.

Topic No. 3: Marine Insurance **40**

1) Arrange a visit to nearest marine Insurance Company or any other organisation handling Marine Insurance to get the knowledge of underwriting and claim settlement procedure get filled in five proposal forms, five claim forms with the necessary documents, submit the report of the claim forms.

Topic No. 4: Motor Insurance **30**

1) Get filled in five proposal forms including valuation of motor vehicle, Calculation of Insurance premium based on rating and tariffs. submit five case studies,

Registration and processing of claims and initial noting, Investigating and Inspecting the damage and losses assessing and quantifying the losses in monetary terms, to visit five accidents spots and prepare and submit report considering all the factors mentioned above.

Topic No. 5: Accident Insurance and Health Insurance 30

1) Preparation of necessary documents for Accident Insurance, Calculation of Premium to get filled in five proposal forms, to prepare an intimation of accident, Spot survey, Investigation, inspection, determination of loss, cause of loss, minimise the loss, Five case studies relating to accident insurance, two visits to Insurance companies and other organisation considering the risk factor. Prepare survey report.

Topic No. 6: Plant and Machinery Insurance 20

1) Get filled in five proposal forms of Plant and Machinery Insurance including valuation of Plant and Machinery.

Topic No. 7: Miscellaneous Insurance 20

1) Get filled in three proposal forms of the various Miscellaneous Insurance policies.

Topic No. 8: Insurance Salesmanship 20

1) Preparation of complete list of prospective clients through personal and social contact and business directories, Interviewing, to contact five prospective clients attempting to sell Insurance by explaining benefits of various suitable Insurance plans, Procuring to canvas sale of insurance policies by explaining various suitable plans, use of skill, selling techniques, inspection, making arrangements for risk inspection if necessary and Prepare report, to get filled in five proposal forms from the client and getting the premium deposited in cash collecting centre, sales after, Service: Assisting the policy holders and servicing policy, keeping record of the business booked, Helping the insured in getting their claims properly assessed, surveyed and settled.

Journal/Project/Viva/Field Visit/O.J.T.