RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

NOTIFICATION

No. Acad/139. Date : 4th June, 2014

To,

The Principal
of all the affiliated Science Colleges
of Rashtrasant Tukadoji Maharaj
Nagpur University, Nagpur

Subject:- Direction No. 3 of 2014.

Sir/Madam,

I am forwarding herewith a copy of the Direction No. 3 of 2014 issued by the Hon'ble Vice-Chancellor under Section 14(8) of Maharashtra Universities Act, 1994 **'Direction governing examination leading to the Post B.Sc. Diploma in Computer Science And Application (One Year – Two Semesters Diploma Course)"In Faculty of Science** and Examination Scheme to be implemented from Academic Session 2014-2015.

You are requested to kindly bring it to the notice of all teachers and students of your college.

Thanking you,

Yours faithfully,

Encl: As above.

Sd/-
(**Dr. A.V. Gomashe**)
Registrar,
Rashtrasant Tukadoji Maharaj
Nagpur University, Nagpur.

No. Acad/139. Nagpur dated the 4th June, 2014

Copy for information and necessary action along with the Direction and Scheme as mentioned above to :-

1. The Dean, Faculty of Science, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
2. The Chairman, Board of Studies in Computer Science, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
3. The Controller of Examinations, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
4. The Director, B.C.U.D., Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
5. The Deputy Registrar (Examinations) Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
6. The Deputy Registrar (Coll. Sec.) Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
7. The Asstt. Registrar (Prof. Exam.), Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
8. The Asstt. Registrar (Conf.), Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
9. The Asstt. Registrar (Exams & Enqury.), Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

10. The Asstt. Registrar University's Sub-Centre at Gadchiroli, R.T.M. Nagpur University, Nagpur.
11. The Officer-in-Charge, Publication Section, R.T.M. Nagpur University, Nagpur.
12. The Asstt. Registrar, Ordinance Section, R.T.M. Nagpur University, Nagpur
13. The P. A. to the Hon'ble Vice-Chancellor, R.T.M. Nagpur University, Nagpur
14. The P. A. to the Hon'ble Pro-Vice-Chancellor, R.T.M. Nagpur University, Nagpur
15. The P. A. to the Registar, R.T.M. Nagpur University, Nagpur
16. Mrs. Veena Prakashe, Information Scientist, R.T.M. Nagpur University, Nagpur

Sd/-

(**Puran Meshram**)
Deputy Registrar(Acad.)
Rashtrasant Tukadoji Maharaj
Nagpur University, Nagpur.

RASHTRASANT TUKDOJI MAHARAJ
NAGPUR UNIVERSITY,
NAGPUR

FACULTY OF SCIENCE

BOARD OF STUDIES IN COMPUTER SCIENCE

SYLLABUS FOR

Post B.Sc. Diploma in Computer Science and Applications (Semester I & II)

(FROM SESSION 2014-15)

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

Direction No. : 3 of 2014

DIRECTION REGARDING THE EXAMINATIONS LEADING TO THE POST B.Sc. DIPLOMA IN COMPUTER SCIENCE AND APPLICATIONS IN SCIENCE IN FACULTY OF SCIENCE

(One Year (Two Semesters) Diploma Course)

(Issued under Section (14(8) of the Maharashtra Universities Act, 1994)

WHEREAS, the Maharashtra Universities Act, 1994, hereinafter referred to as Act has come into force from 22nd July, 1994 and was amended from time to time.

AND

WHEREAS the Management Council accepting the recommendation of the Board of College & University Development, recommended to the government of Maharashtra for grant of permission to start Post B.Sc. Diploma in Computer Science and Applications course in the university from the academic session 2006-07 subject to preparing of ordinances and syllabi for the courses.

AND

WHEREAS the government of Maharashtra granted permission to the colleges to start Post B.Sc. Diploma in Computer Science and Applications course from the academic session 2006-07.

AND

WHEREAS the as per recommendation of Board of Studies in Computer Science &. Faculty of Science approved the syllabus of Post B.Sc. Diploma in Computer Science and Applications course along with scheme of examination.

AND

WHEREAS Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur granted initial affiliation to the course to be started from the session 2006 -07.

AND

WHEREAS it is necessary to start the course in the same Academic Session i.e. the session in which Government granted the permission, or immediately in next session, otherwise the permission granted by the government shall stand canceled.

AND

WHEREAS the Academic session 2006-07 is already over and Academic session 2007- 08 is already commenced w.e.f. 1st June 2007.

AND

WHEREAS, the Academic session 2007 - 08 has commenced from 1st June 2007, it is felt expedient in the interest of the student to give effect to the decision of Academic Council to start the Post B.Sc. Diploma in Computer Science and Applications course from the Session 2007 - 08.

AND

WHEREAS the ordinance making is a time consuming process.

Now therefore, I, Anoop Kumar, Vice-Chancellor, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur in exercise of the power vested under section 14(8) of the Maharashtra University Act of 1994 do hereby issue the following direction:

1. The Examination leading to the course of Post B. Sc. Diploma in Computer Science & Applications shall be held twice a year at such places and on such dates as may be appointed by the Academic Council.

2. Subject to the compliance with the provisions of this Ordinance and of any other Ordinance in force from time to time an applicant for admission to the examination shall have:

(a) Obtained a B. Sc. degree of this university or of any other Statutory University and had offered Mathematics as one of the optional subjects for the B. Sc. degree examination OR B.E. or B. Tech. or BCA or B.Sc.(IT) and
(b) Prosecuted a regular course of study for not less than one academic year in any relevant institution or and colleges affiliated to the Nagpur University where the course will be conducted.

3. Without prejudice to the other Provisions of the Ordinance No.6 relating to the Examinations in General, the provision of paras 5, 6, 10, 28 and 31 of the said Ordinance shall apply to every collegiate candidate.

4. (a) Course fee to be decided by the Academic Council.
(b) The fee for the examination to be decided by the Academic Council including practical examination.

5. The duration of the course shall be one Academic year (two semesters).

6. The final total assessment of the candidate is made in terms of an university practical and written theory exam for the course. For each paper, the practical and project the minimum passing is 40% marks and aggregates is 50% marks. Details are as follows:

Post B.Sc. Diploma in Computer Science and Applications (Semester-wise)Teaching and Examination Scheme

Post B.Sc. DCS&A Semester-I

Sr. No.	Theory Paper/ Practical	Subjects	Teaching Scheme (Hrs/Week)			Credits	Examination Scheme					
			Th	Pr.	Total		Duration (Hrs)	Max. Marks		Total Marks	Min. Passing Marks	
								External Marks	Internal Marks		Th.	Pr.
1	I	Computer Fundamentals	4		4	4	3	80	20	100	40	-
2	II	Programming In 'C ++'	4		4	4	3	80	20	100	40	-
3	III	Operating Systems	4		4	4	3	80	20	100	40	-
4	IV	Data Structures	4		4	4	3	80	20	100	40	-
5	V	System Analysis and Design	4		4	4	3	80	20	100	40	-
6	Practical - I	Programming In C++		8	8	4	4	50	50	100	-	40
7	Practical - II	Data structures using C++		8	8	4	4	50	50	100	-	40
		Total	20	16	36	28	-	-	-	700	200	80

Post B.Sc. DCS&A Semester-II

Sr. No.	Theory Paper/ Practical	Title of Paper	Teaching Scheme (Hrs/Week)			Credits	Examination Scheme					
			Th	Pr.	Total		Duration (Hrs)	Max. Marks		Total Marks	Min. Passing Marks	
								External Marks	Internal Marks		Th.	Pr.
1	I	Linux Operating System	4		4	4	3	80	20	100	40	-
2	II	Programming In Java	4		4	4	3	80	20	100	40	-
3	III	Visual Basic Programming	4		4	4	3	80	20	100	40	-
4	IV	Data Base Management System	4		4	4	3	80	20	100	40	-
5	V	SQL And PL/SQL	4		4	4	3	80	20	100	40	-
6	Practical - I	Java Programming		8	8	4	4	50	50	100	-	40
7	Practical - II	VB Programming & Oracle		8	8	4	4	50	50	100	-	40
8	Project			8	8	4	4	50	50	100		40
		Total	20	24	44	32	-	-	-	800	200	120

7. a) The scope of the topic in various papers shall be as indicated in the syllabus.
b) the medium of instructions and the examination shall be in English only.

8. In order to pass the examination, an examinee shall obtain not less than 40% marks in each theory papers, practicals and project separately and not less than 50% marks in aggregate.

9. An examinee who is failed in the examination shall be eligible for admission to the next written and practical examination on payment of fee prescribed for the examination.

10. The casual student, will be governed by the general rules applicable to them, if admitted by the Head of Department / Institute.

11. Successful examinee obtaining 60% or more marks in the aggregate at the examination shall be placed in the first division and those obtaining 60% but not less than 50% marks in the second division.

12. Provision of the Ordinance No. -- relating to the condonation of deficiency of marks for passing the examination and Ordinance No. 10 relating to the exemption and compartments shall apply to the examination under this ordinance.

13. As possible after the examination but not later than the 30th June, Management Council shall publish the list of successful examinees.

14. Notwithstanding anything to the contrary in this, Ordinance no person shall be admitted to this examination **if** he has already passed the same examination or an equivalent examination of any other statutory University, which has been recognized as equivalent to the examination.

15. A successful examinee shall receive a Diploma in prescribed form signed by the Vice Chancellor.

16. With the issuance of the Ordinance, the main Ordinance No. 1 of 1984, 6 of 1996 and 1 of 2008 amended ordinance shall stand repealed.

Sd/-
Anoop Kumar
Vice-Chancellor

Nagpur:-
Date :- 16.5.2014

Semester-wise Syllabus for
Post B.Sc. Diploma in Computer Science and Applications
Teaching and Examination Scheme

Post B.Sc. DCS&A Semester-I

Sr. No.	Theory Paper/ Practical	Subjects	Teaching Scheme (Hrs/Week)			Credits	Examination Scheme				
			Th	Pr.	Total		Duration (Hrs)	Max. Marks		Total Marks	Min. Passing Marks	
								External Marks	Internal Marks		Th.	Pr.
1	I	Computer Fundamentals	4		4	4	3	80	20	100	40	-
2	II	Programming In 'C + +'	4		4	4	3	80	20	100	40	-
3	III	Operating Systems	4		4	4	3	80	20	100	40	-
4	IV	Data Structures	4		4	4	3	80	20	100	40	-
5	V	System Analysis and Design	4		4	4	3	80	20	100	40	-
6	Practical - I	Programming In C++		8	8	4	4	50	50	100	-	40
7	Practical - II	Data structures using C++		8	8	4	4	50	50	100	-	40
		Total	20	16	36	28	-	-	-	700	200	80

Post B.Sc. DCS&A Semester-II

Sr. No.	Theory Paper/ Practical	Title of Paper	Teaching Scheme (Hrs/Week)			Credits	Examination Scheme				
			Th	Pr.	Total		Duration (Hrs)	Max. Marks		Total Marks	Min. Passing Marks	
								External Marks	Internal Marks		Th.	Pr.
1	I	Linux Operating System	4		4	4	3	80	20	100	40	-
2	II	Programming In Java	4		4	4	3	80	20	100	40	-
3	III	Visual Basic Programming	4		4	4	3	80	20	100	40	-
4	IV	Data Base Management System	4		4	4	3	80	20	100	40	-
5	V	SQL And PL/SQL	4		4	4	3	80	20	100	40	-
6	Practical - I	Java Programming		8	8	4	4	50	50	100	-	40
7	Practical - II	VB Programming & Oracle		8	8	4	4	50	50	100	-	40
8	Project			8	8	4	4	50	50	100		40
		Total	20	24	44	32	-	-	-	800	200	120

Post B.Sc. DCS&A Semester I (From 2014-2015)

Post B.Sc. DCS&A Semester I

Paper I

COMPUTER FUNDAMENTALS

UNIT - I:

Basic Components of Digital Computers: Block Diagram**. CPU:** Functions of Each Unit: Primary Memory, ALU and CU, Instruction format. **Bus**: Data, Control and Address Bus **Number Systems:** Binary, Octal, Decimal, HexaDecimal, Their Conversions, Binary Arithmetic. ASCII, BCD, EBCDIC**.**

Language Evolution: Generation of Languages: Machine, Assembly, High Level Languages. Characteristics of Good Language Translators**:** Compiler, Interpreter and Assembler. Source and Object Program.

UNIT - II:

Memory: Static & dynamic, RAM, ROM, PROM, EPROM, EEPROM, flash and Cache.
Storage Devices: Hard Disk, Zip Disk and Optical Disk. Pen Drive, Blue Ray.

UNIT - III:

Input Devices: Keyboard, Mouse, Light Pen, Touch Screen, Voice Input, MICR, OCR, OMR, Barcode Reader and Flatbed Scanner.
Output Devices: VDU, Printers: Dot Matrix, Laser and Inkjet.
Plotters: Drum Flat-Bed and Inkjet.

UNIT - IV:

Network: Network terminology, Topologies: Linear, Circular, Tree and Mesh. Types of Networks: LAN, WAN, MAN. Repeaters, Bridge, Routers, Brouters and Gateway. Modem for Communication between pc's, Wi-Fi network, Introduction of Bluetooth and Infrared devices. Network protocols. Architecture**:** Peer-to-Peer, Client/Server.

Reference Books:

1. Information technology concepts by Dr. Madhulika Jain, Shashank & Satish Jain, [BPB Publication, New Delhi.]

2. Fundamentals of Information Technology By Alexis And Mathews Leon
[Leon Press, Chennai & Vikas Publishing House Pvt Ltd, New Delhi]

Post B.Sc. DCS&A Semester I

Paper II

PROGRAMMING IN 'C + +'

UNIT- I:

Programming Structure: Sequence, Selection, Iteration and Modular. **Problem Solving techniques**: Development Tools**:** Algorithm, Flowcharts and Pseudo code (Definition and its characteristics) **C++ Character set** Tokens**, Identifier, Keywords, Variables,** Data types**, Qualifiers.** Operators and Expressions**: Arithmetic, Relational, Logical, Bit-Wise, Compound Assignment, Increment, Decrement, Conditional and Special operators. Typedef, Type Conversion, Constants, Declaring Symbolic Constants, Character Strings, Enumerated Data Types, Operator Precedence and Associativity.** Library functions**. : Maths, Character & Standard Library Functions. Control Structure:** Compound Statement, Selection Statement: if, if-else, Nested if, switch. Iteration statement: for, while, do..while, Nested loops Jump statement: break, continue, goto.

UNIT :

Arrays: Need, Types: Single and Two Dimensional Array. **Strings**: Strings Manipulation, Arrays of Strings, Evaluation order **Function:** Function Components, Return Data type, Parameter Passing, Return by Reference, Default Arguments, Inline Functions, Function Overloading, Recursive Functions, Arrays with Functions, Storage Classes.

UNIT :–III

Structure: Declaration, Definition, Accessing structure members, Initialization, Nesting of Structures. **Union**: Unions, Differences between Structure and Union **Pointer:** Introduction, Address Operator (&), Pointer variables, void pointers, Pointer Arithmetic, Runtime memory management: New & Delete operator, Pointers to Pointers. **File handling :** Hierarchy of File Stream Classes, Opening & closing a file, Testing for errors, File Modes, File pointers and their manipulations, Sequential Access, Random Access , Error Handling During File Manipulation, Command Line arguments.

UNIT IV:–

Object Oriented Methodology: Elements of Object Oriented programming, Objects, Classes, Oops features. **Classes & Objects:** Specifying a Class, Creating Objects, Accessing Class members, Defining member function, Outside Member Functions as inline, Accessing Member Functions within the class, Static data member, Access Specifiers : Private, Protected and Public Members.

Reference Books:

1. The Art of programming through flowcharts & algorithm by Anil B. Chaudhari Firewall Media, Laxmi publication, New Publication.
2. Mastering C++ by K R Venugopal Tata McGraw-Hill , New Delhi.
3. Programming with C++ by P. Radha Ganeshan, Scitech Publication

Post B.Sc. DCS&A Semester I

Paper III

OPERATING SYSTEMS

UNIT - I:

Structure of Operating System, Operating System functions, Characteristics of Modern OS. **Process Management**: Process states, Creation, Termination, Operations on Process, Concurrent process, Processes Threads, Multithreading, Micro Kernels

CPU Scheduling: Schedulers, Scheduling Methodology, CPU Scheduling Algorithm: FCFS, SJF, RR, Priority Scheduling.

UNIT – II:

Performance comparison : Deterministic Modeling , Queuing analysis, Simulators.

Deadlock and Starvation: Resource Allocation Graph, Conditions for Dead Lock, Dead Lock Prevention, Dead Lock Detection, Recovery from Deadlock.

UNIT - III:

Memory Management: Logical Vs. Physical Address Space, Swapping, Memory Management Requirement, Dynamic Loading and Dynamic Linking, Memory Allocation Method: Single Partition allocation, Multiple Partitions, Compaction, paging, segmentation, Segmentation with paging. Protection.

UNIT - IV:

I/O Management: I/O hardware, I/O Buffering, Disk I/O, Raid, Disk Cache. **File Management:** File Management system, File Accessing Methods, File Directories, File Allocation Methods, File Space Management, Disk Space Management, Record blocking. **Protection Mechanisms**: Cryptography, Digital Signature, User Authentication.

Reference Books:

1. Operating Systems by P. Balakrishna Prasad [Scitech Publication]
2. Operating System Concept : Silbershaz (Addision Education)
3. Operating Systems - H.M. Deitel - Addision Wesley.
4. Operating Systems- John J. Donoven.
5. Operating System : A.S.Godbole (TMH)
6. Modern Operating Systems : Tenenenbaum (Pearson Education)
7. Operating System : Peterson.

Post B.Sc. DCS&A Semester I

Paper IV

DATA STRUCTURES

UNIT - I :
LINKED LIST : Linked List, Representation of Single, Double, Header, Circular Single and Double Linked list, All possible operations on Single and Double linked List using Dynamic representation, Polynomial Representation and its Manipulation.

UNIT - II :
STACKS : Stacks terminology, Representation of Stacks in Memory, Operation on Stacks, Polish Notations, Translation of infix to postfix & prefix expression, Infix to Postfix Conversion, Evaluation of Postfix Expression, Recursion, Problems on Recursion, Quick Sort and Tower of Hanoi Problem.

UNIT - III :
QUEUE : Representation of Queues in Memory, Circular Queue. Dequeue and Priority Queue. Operations of above Structure using Array and Linked Representation.
SORTING AND SEARCHING: Selection Sort, Insertion Sort, Merge Sort, Efficiency of Sorting Methods, Big-O Notations.

Hash Tables, Hashing Technique, Collision Resolution Technique.

UNIT - IV :
TREES : Basic Terminologies, Representation of Binary Trees in Memory, Traversing of Binary tree, Binary Search Tree, Operation on Binary Search Tree, Heap Tree, Operation on Heap Tree, Heap Sort Method

GRAPHS : Basic Terminologies, Definition and Representation of Graphs in Memory: Linked List and Matrix Representation. Traversing graphs : BSF, DFS Method.

Reference Books:

1. Classical Data Structures : D. Samanta. PHI, New Delhi.
2. DATA STRUCTURE : LIPSCTUZ SCHUM OUTLINE SERIES
3. Data structure Using C++ : Y. Kanetkar
4. Data Structures Using C++: Tennenbaum
5. Data structures by Tremblay Sorenson
6. Data structures by Bhagat singh Naps

Post B.Sc. DCS&A Semester I

Paper V

SYSTEM ANALYSIS AND DESIGN

UNIT - I :

Introduction : System, Subsystems, Components of Computerized Information System, Systems Analysts, SDLC, Prototyping.

Feasibility Study and Analysis: Identifying Problems, Organizing Feasibility Analysis: Economic, Financial, Organizational and Technological. Feasibility Decision, Choice of a solution.

Data Collection: Interviews, Brain Storming, Questionnaires, Document Search, Observation.

UNIT - II :

Structured tools and techniques of Data analysis : Structured English, Process Charts, SOP, Decision Tables and Decision Trees, Data Flow Diagram, Data Dictionary.
(Special emphasis on problem solving)

System Design : Input design: Input Validation, Human factor Consideration, Messages, System Tolerance. Output design: Categories of output, Design Principles, Control of Output. Forms: Principles of Form Design, Ways to ensure Quality Forms.

Codes: Types, Physical Representation of Codes, Principle of Code Design.

UNIT - III :

Implementation: Training, Operational Training and Related Activities, Planning to Implement Change, Change Strategies.

Testing: Preparation for Testing, Test Execution: Levels of Testing, Component, Function, Subsystem, System, Test Evaluation, Acceptance.

Conversion: Cold Turkey, Parallel, Pilot, Modular and Sequential Methods. Conversion Period Length. **System Evaluation.**

UNIT - IV :

Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, **Scheduling:** Work Breakdown Structure, Activity Networks and CPM, Gantt Charts, PERT Charts, Project Monitoring and Control. Risk Management, Software Configuration Management: Necessity, Configuring Management Activities

Software Reliability and Quality Management: Software Reliability, Software Quality, ISO 9000. Software Maintenance: Characteristics of Software Maintenance, Maintenance Process Models, Estimation of Maintenance Cost.

Software Reuse: What can be reused, Why no reuse so far, Basic Issues.

Reference Books:

1. Information Systems Analysis, Design and Implementation By K. M. Hussain Donna Hussain [Tata McGraw-Hill Publishing Company Ltd, New Delhi]
2. Fundamentals of Software Engineering by Rajib Mall [PHI Publication]
3. Workbook on Systems Analysis & Design by V. Garg [PHI Publication]
4. System Analysis and Design- Don Yeates, shiebls, Helmy (M).
5. System Analysis & Design - Edward –TMH
6. System Analysis and Design – Satzinger, Robert Jackson and Stephen Burd, Thomson Learning
7. Introduction to Systems Analysis Design, Igor Hawryszkiewycz, PHI

Post B.Sc. DCS&A Semester II

Paper I

LINUX OPERATING SYSTEM

UNIT - I :

Logging In and Logging Out, Anatomy of Linux OS, Directory Structure, /usr Directory, File Types: User datafiles, System data files, Executable files. Naming files and directories, Spawning Processes. **Shell:** Creating User Account, Shell Program, bash shell, Changing shell prompt. **Commands:** Basic Syntax for a command, Exploring the Home Directory, ls, mkdir, rmdir, stat, cat, rm, mv, cp.

UNIT - II :

Editor: Vi editor. **Hooking up Hardware Devices:** Formatting a Floppy Disk**,** Gathering important system information. Backing Up and restoring the File **System:** Simple Backup, gzip, gunzip, tar. **Printing files:** Print Spool directory, Sending files to Printer.

UNIT - III :

Sharing Files with other Users: Maintaining User Accounts, Changing Password, Creating Group Accounts, Granting Access to files, Changing File Ownership, Protecting Files, Making a File Read-Only. Working with Processes**:** Types of processes, ps Command, Creating process, killing process, free command and top utility.

UNIT - IV :

Managing Disk Space: df, du commands, Creating Additional Free Disk Space, Locating Unused Files, Setting System Clock. Communication Utilities: who, who am i, finger, mesg, write, wall, talk, Creating a message of the day. X Window System, Graphical User Interfaces: KDE and GNOME Desktop Environment.

Reference Books:

1. SAMS Teach Yourself Linux by Craig and Coletta Witherspoon [Techmedia]
2. LINUX complete reference by Richard Peterson

Post B.Sc. DCS&A Semester II

Paper II

PROGRMMING IN JAVA

UNIT - I :

Introduction to Java: -History of Java, features of Java, getting started with Java. **Java programs**:-Introduction of Application & Applets. **Variables**: -Variable naming, variable initialization, assign values, Rules of variables, Scope of variable. **Operators**: - Arithmetic, Assignment, Unary, Comparison, Shift, Bit- Wise, Logical, Conditional, New, Special, Relational. Data types:-Integers, Char, String, Float etc. Typecasting: **Tokens**: -Java tokens Order of precedence of operators Streams: - Input and output.

UNIT - II :

Creating a class & subclass: -Declaring a class, Naming class, Rules to assign Class & Subclass, Creating a new object, Class of an object. **Data members**: -Declaring data member, Naming variables, using class members. **Methods**: -Using data members, Invoke a method, passing arguments to a method, calling method. **Access Specifier & Modifiers**: -Public, Private, Protected, Static & Final. **Overloading**: -Method overloading, Constructor overloading. **Java class library**: - Different types of classes. **Decision making & loops**:-If-then-else, Switch,? : operator, While-loop, do-while loop, for. **Array**: -Creating an array, one-dimensional array, two-dimensional array. **String**: - String array, string methods. **Inheritance**: -Single & multiple inheritances **Interfaces**: - Defining interfaces, extending interfaces, implementing interfaces.

UNIT - III :

Packages: -Java API packages, creating packages, accessing packages, adding a class to packages. **Import statement**: - Introduction & implementation of import statement. **Applets**:-Introduction to Applets & Application, how applets application are different creating An applet. Applets life cycle, designing a web page, creating an executable applet, running the applet, applet tags, passing a parameter to applet, HTML tag, Converting applet to application. **Threads**:-Overview of threads, single & multiple threads, lift cycle of threads, stopping & blocking threads, working with threads, priority to thread, synchronization. **Exceptions & Errors**:-Introduction, types of error, exception, syntax of exception, handling techniques, exception for Debugging.

UNIT - IV :

Event: -Event driven programming**,** handling an (AWT) events**. Graphic class:-** Introduction, the graphic classes, drawing & filling of lines, rectangle, circle & ellipse, arcs, polygons, text & fonts, creating a font class, font objects, text, coloring object. **Streams:-**Introduction, Abstract stream classes, file input & output. **AWI Applications**: -Creating a GUI using AWT toolkit, using component class, frames. **Components & Control: -**Textfield, textarea class, label, button, choice, list, checkbox, class, and combo. **Menus: -**Creating a popup menus. **Image**: - Type of image, Properties of an image, Displaying an image. **Layouts**: -Using Window Listener interface, Different types of Layout, Layout manager, Flow manager, Grid manager. **Container**: -Different types of container (Frame, Dialog, Panel)

Reference Books:

1. Programming with Java a primer II edition:-E Balaguruswamy(Tata McGraw-Hill)
2. Java Programming (For absolute beginners) Russell PHI
3. Black Book on Java
4. Java-Complete References

Post B.Sc. DCS&A Semester II

Paper III

VISUAL BASIC PROGRAMMING

UNIT-I :

Working with Visual Basic Window Components: Menu Bar, Tool Bar, Project Explorer Window, Form Layout Window, properties Window, Toolbox, Code Editor Window **Working with Forms:** Properties, Events, Methods Working with Basic Controls:Label, CommandButton, TextBox, OptionButton, Frame, CheckBox, ListBox, ComboBox, Image, Scroll, Picture, Timer, DriveListBox, DirListBox, FileListBox and Shape Controls. **Basic Programming Fundamentals:** Variables, Data types, Constant, Conversion Function. Scope of Variable: Public, Private Static. Operators: Logical, Arithmetic, Concatenation, Comparison. Decision Structure: If.. Then, If..Then..Else, Select Case.. End Case. Loop Structure: Do..While, While.. Wend, For.. Next, With..EndWith. DoEvents()

UNIT-II :

Arrays: Dynamic Array, Preserve and Control arrays. **Procedure:** General procedure, General Methods for Passing Arguments to a Procedure, **Functions:** User-Interaction, String, Math, Date, Conversion Functions.
Modules: Form, Standard.

UNIT-III :

Menus: Creating, Adding Menu Items, Creating Shortcut, Adding Separators Bars, Submenus, Code for Menus. Creating Popup Menu: System, Custom. **Database Handling:** Database Concepts, Creating and Accessing Database, Using Data Control.
Using DAO: Creating Search Programs, Numeric Search and Complex Search Programs.

UNIT-IV :

Using ADO Data Control, Data Link, ODBC Data Source name, Using Connection String, Creating Navigating buttons. Working with Advanced Data Controls **:** DataList Control, DataCombo Control, DataGrid Control and Msflexgrid Control. **Handling Errors** : Run Time, Trapping and Handling Error, ERR Object. Data Environment and Data Reports.

Reference Books:

1. VISUAL BASIC – to Advance by Soma Dasgupta [BPB Publication]
2. Evangelos Petroutsos, Mastering Visual Basic 6.0 BPB Publication.
3. VISUAL BASIC 6 COMPLETE REFRENCE (TMH PUB)
4. Visual Basic 6 Deitel & Deitel (Pearson Education)
5. Mastering VB 6.0 Black Book -Peter - Norton-Techmedia.

Post B.Sc. DCS&A Semester II

Paper IV

DATA BASE MANAGEMENT SYSTEM

UNIT- I :

DBMS : Definition: Databases, DBMS, Problems with traditional file processing system, Objectives of the database systems, Three level architectures of DBMS, Component of DBMS, Database Administrator, Database Users, Data model, Different types of data models, Concepts of Hierarchical, Network Models.

UNIT-II :

E-R Models : Basic Concepts, Entity, Attributes, Relation Ship, Mapping, Keys, Weak and Strong Entity Set, Problems on E-R Diagrams, Extended E-R Features: Specialization, Generalization, Aggregation, Problems on Reduction of an E-R Schema to Tables, Tabular representation of Strong, Weak entity Sets and Relationship Sets.

UNIT-III :

Relational Model: Structure, Relational Algebra, Fundamental Operations, Set – Intersection, Natural Join, Division and Assignment Operation. Extended Relational Algebra Operations, Aggregate Functions.

UNIT–IV :

Functional Dependency: Functional Dependency, Fully Functional Dependency, Partial Dependency, Transitive Dependency, Multi Valued Dependency.
Normalization, Normal Forms (1NF, 2NF, 3NF, BCNF, 4NF, 5NF). Problems on Normal forms.

Reference Books:

1. Data Base System Concepts By A SilbersChatz By Henry Korth And S.Sudarshan [Mcgraw-Hill ltd. New Delhi] 3rd Edition.
2. Introduction to Data Base Management by NAVEEN PRAKASH [Tata McGrawHill ltd.]
3. Bipin C. Desai, An Introduction to Database Systems, Galgotia Publications.
4. Raghu Ramakrishnan & Johannes Gerhrke, "Data Base Management Systems", Mc Graw Hill International Edition, 2000
5. Muzumdar, Introduction to Database Management Systems. TMH

Post B.Sc. DCS&A Semester II

Paper V

SQL AND PL/SQL

UNIT - I:

CODD'S Rules, Oracle Database Objects, Sub Languages of SQL, Data types, Operators. **DDL Statement**: Creating Tables, Deriving Table from existing table, Altering, Dropping Tables. Integrity Constraints, Specifying Names for the Constraints, Viewing Integrity Constraints, Adding and Dropping Constraints. DML Statements: SELECT statement, Insert, Update, Delete, Working with Sequences and Synonyms. Built-in functions: Arithmetic, Date, Character, Conversion, Single row, Aggregate, Decode.
Joins, Set Operators and Sub queries. DCL and TCL Statements: Grant, Revoke, Commit, Rollback and Savepoints.

UNIT - II:

VIEWS: Creating Views, Dropping Views, Inserting, Updating and Deleting Data using Views, Types of Views. PL/SQL Programming: PL/SQL Data Types, Identifiers, Operators and Expressions, Iterative Statements, Conditional Statements, emphasis on Problems

UNIT - III:

Exception Handling: Predefined Exceptions, User defined Exceptions. Cursors: Declaring Cursors, Opening and Retrieving Records, Closing cursors. Attributes of Explicit and Implicit Cursors, Parameter Passing in Cursors. Procedures: Create and Drop Procedure, Creating Procedures with Parameters, Calling Procedures, Granting the EXECUTE Permission Problems on Exception Handling, Cursors and Procedures.

UNIT - IV:

Function: Creating and Dropping Function, Purity Levels in Functions, Executing Functions. **Triggers:** Create Triggers, Type of Triggers, Creating BEFORE and AFTER Triggers, INSTEAD-OF Triggers, Trigger Predicates, Inserting, Updating and Deleting Triggers, Enabling, Disabling and Dropping Triggers. Problems on Functions and Triggers.

Reference Books:

1. Understanding ORACLE By Ivan Bayross [BPB Publication]
2. Database System Using Oracle: A Simplified Guide to SQL & PL-SQL: Nilesh Shah, PHI Publication.
3. Database Management Systems (Complete practical approach) by Sharad Maheshwari & Ruchin Jain, Firewall media
4. Dr. P.S.Deshpande SQL & PL/SQL for Oracle 10g Black Book
5. Scott Urman Programming PL/SQL TMH