

Bachelor of Computer Application (Semester – I & II)
Saurashtra University
Effective from June - 2008

Bachelor in Computer Application (BCA)
(3 years – Six Semester Full Time Course)

Ordinance, Regulations and Examination Scheme :

O.S. B.C.A. – 1 : Candidate for admission to the Bachelor of Computer Application must have passed standard 12th or equivalent examination from Gujarat higher secondary board or any other board.

Candidate seeking admission directly in third semester of Bachelor of Computer Application must have passed Examination of Diploma in Engineering in Computer Engineering(CE) / Computer Science(CS) / Information Technology(IT) after 12th science.

O.S. B.C.A. – 2 : The duration of the course will be of three full time academic years. The examination for the Bachelor of Computer Application course will be divided into six semesters. No candidate will be allowed to join any other course or service simultaneously.

O.S. B.C.A. – 3 : Candidate who have passed an equivalent examination from any other board or examining body and is seeking admission to the B.C.A. course will be required to provide necessary eligibility certificate.

O.S. B.C.A. – 4 : No candidate will be admitted to any semester examination for B.C.A. unless it is certified by the Principal that he has attended the course of study to the satisfaction of the principal of the college.

O.S. B.C.A. – 5 : Candidate desirous of appearing at any semester examination of the B.C.A. course must forward their application in the prescribed form to the University through the principal of the college on or before the date prescribed for the purpose under the relevant ordinances.

O.S. B.C.A. – 6 : No candidate will be permitted to reappear at any semester examination, which he has already passed. The marks of successfully completed paper will be carry forwarded for the award of class.

O.S. B.C.A. – 7 : There shall be an examination at the end of each semesters to be known as first semester examination, second semester examination respectively. At which a student shall appear in that portion of theory papers, practical and viva – voice if any, for which he has kept the semester in accordance with the regulations in this behalf.

A candidate whose term is not granted for what so ever reason shall be required to keep attendance for that semester or term when the relevant papers are actually taken at the college.

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O.S.B.C.A. – 8 :

Resolution to keep term of all computer courses covering U.G. and P.G. Degree course.

Any candidate can go up to take admission in pre to pen-ultimate semester irrespective of failure in any number of subjects.

A Candidate can take admission to pen-ultimate semester if he/she is not failing to more then two subjects.

A candidate can take admission to ultimate {final} semester if he/she is clear all semesters before pen-ultimate semester and not failing in more then two subjects of pen-ultimate semester.

That is a candidate will be permitted to continue his/her study upto the 4th semester examination without passing his/her previous semester examination.

A candidate can take admission to fifth (pen-ultimate) semester if he/she is failing in NOT more then two subjects of previous (1 to 4) semesters.

A candidate can take admission to Sixth (Ultimate Final) Semester if he/she is not failing in more then two subjects of 5th Semester. Provided he/she should have cleared all 1 to 4 semester.

R.S.B.C.A. – 1 Standard Of Passing

The standard of passing the B.C.A. degree examination will be as under :

- (1) To pass any semester examination of the B.C.A. degree, a candidate must obtain at least 40% marks in the university examination separately in each course of theory and practical.
- (2) Those of the successful candidates who obtain 50% or more marks in the aggregate of all the semester taken together will be placed in the **second class** and those who obtain 60% or more marks in the aggregate of all the semester taken together will be placed in the **first class**. The successful candidates who obtain 70% or more marks in the aggregate of all the semester taken together will be declared to have passed the examination in the **first class with distinction**.
- (3) A result of candidate who have obtained admission directly in Bachelor of Computer Application semester – III will be declared by considering his marks of semester III to VI in aggregate and accordingly class will be awarded as per normal percentage of marks fixed for other candidate.

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BCA (Semester – I)

SR.NO.	SUBJECT	NO. OF THEORY LECT. PER WEEK	NO. OF PRACTICAL PER WEEK
1	CS – 01 COMMUNICATION SKILL	4+1	-
2	CS – 02 PROBLEM SOLVING METHODOLOGIS AND PROGRAMMING IN C	4+1	6
3	CS - 03 COMPUTER FUNDAMENTALS AND EMERGING TECHNOLOGY	4+1	-
4	CS - 04 NETWORKING & INTERNET ENVIRONMENT	4+1	3
5	CS – 05 PRACTICALS (BASED ON CS-4 & PC SOFTWARE)	-	As mentioned above against sr.no. 4 & 3 practicals of PC SOFTWARE
5	CS – 05 PRACTICALS (BASED ON CS-2)	-	as mentioned above against sr.no. 2

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CS-01 : Communication Skill				
Sr. No.	Topics	Detail	Marks	Min. Lect.
1	Grammar	Articles Tenses Active and Passive Voice Direct and Indirect speech Auxiliaries and modals	25	20
2	Practical letter writing	Official letters Business letters Application or resume	15	10
3	Report Writing	Business report Press Report	20	10
4	Essay Writing	Current Topics	10	4
5	Testing Vocabulary	Confusing words * One word substitution * Antonyms * Synonyms * * See Annex - I	10	5
6	Translation	English Into Gujrati Or Hindi Gujrati Or Hindi Into English	10	6
7	Comprehension		10	5
Total:			100	60

Students seminar - 5 Lectures.
 Expert Talk - 5 Lectures
 Students Test - 5 Lectures.

Total Lectures 60 + 15 = 75

Reference Book

1. High School English Grammer and Composition By Wren & Martin

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ANNEXURE – I

1.

WORDS LIABLE TO BE CONFUSED		
1	Accept Except Except	She refused to accept her costly present He expected to be a C.A. All except one went out for a walk.
2	Adapt Adopt Adept	We must adapt to our circumstances He adopted his brother's son He is adept in music
3	Advice Advice	My advice has no effect on him He always advised all
4	Affect Effect	His sad story affected us very much My advice has no effect on him
5	Bare Bear	He comes out with bare foot He bears all the expenses
6	Berth Birth	We have booked a first class berth She gave birth to a beautiful baby
7	Born Borne	A child was born blind I have always borne her expenses
8	Canvas Cavass	Tennis players use canvas shoes He worked hard to canvass support for his friend
9	Casual Casual	He is on casual leave It is a casual thing
10	Check Cheque	He is told to check all the plants A cheque of Rs. 100 was drawn in favour of his sister
11	Cite Site	He cited many cases to his support That is the site for new college
12	Council Counsel	He is the member of the executive council My lawyer gave me a good counsel
13	Continual Continuous	A continual rain tires us A continuous rain caused the floods
14	Course Coarse	I have done my course well Labourers have coarse hands
15	Elicit Illicit	The police could not elicit information from the thief Illicit manufacture of liquore is going on in Gujarat
16	Ensure Insure Assure	I ensure my success by everyday practice He insured his life for Rs. 2,00,000 He was assured success by his teachers

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17	Eminent Imminent	He is an eminent fello When examination is imminent, students are studying
18	Gate Gait	He came to the gate to receive her She has a gracefull gait
19	Jealous Zealous	Never be jealous of anybody We need zealous social workers
20	Plain Plane	She is a plain girl It is a plane ground
21	Pray Prey	We must pray to god everyday Lion is beast of prey
22	Prescirbe Proscribe	Take only the prescribed medicine The governement should proscribe the vulgur books
23	Refuse Refuge	Don't refuse him anything He gave him refuge
24	Stationary Stationery	The sun is stationary He deals in stationery
25	Statue Statute	They created a statue in his memory I have not studied that statute

2.

ONE WORD SUBSTITUTION		
1	Autograph	One's own handwriting
2	Bankrupt	One who can't pay off his debt.
3	Biography	Written life of a person by one self.
4	Catlogue	A list of things.
5	Colleague	A fellow worker.
6	Cosmopolition	Common to all the world.
7	Democracy	Government by the people.
8	Edible	The which could be eaten.
9	Eternal	That which lasts forever.
10	Extempore	Without preparation.
11	Incredible	That which can't be believed.
12	Honorary	Holding office without pay.
13	Manuscript	Something written with the hands.
14	Manufacture	To make / produce goods.
15	Mercenary	An hired assassion.
16	Orphan	A child who lost both his parents.
17	Postmortem	Investigation of dead body after death to find the cause of death.
18	Revocable	Capable of being cancelled.
19	Solvent	Able to pay all that one owns to others.

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20	Spendthrift	A person who spends money without foresight.
21	Termination	That which comes to an end.
22	Ultimatum	Final notice.
23	Unanimous	All agreeing on one matter unitedly.
24	Voluntary	That which is not compulsory.
25	Warranty	To give authority / a kind of guarantee.

3.

SYNONYMS & ANTONYMS			
No.	Words	Synonym	Antonym
1	Absurd	Redicious	Proper
2	Ascent	Climb	Descent
3	Authentic	True	Spurious/false
4	Bondage	Slavery	Freedom
5	Brave	Bold	Coward
6	Contrary	Opposite	Similar
7	Courtrous	Polite	Rude
8	Deny	Refuse	Accept
9	Energy	Power	Weakness
10	Eternal	Permanent	Temporary
11	Feeble	Weak	Strong
12	Foolish	Dull	Clever
13	Frank	Ingenous	Deceitful
14	Grief	Sorrow	Joy
15	Legal	Legitimate	Illegal
16	Liberal	Generous	Narrow
17	Famous	Popular	Notorious
18	Loyal	Faithful	Traitor
19	Marvelous	Splendid	Ordinary
20	Modest	Humble	Vain / proud
21	Need	Destitution	Affluent
22	Option	Choice	Compulsory
23	Obvious	Clear	Confused
24	Permit	Allow	Prohibit
25	Pious	Holy	Siful
26	Polite	Courteous	Harsh
27	Proprietor	Owner	Tenant
28	Quit	Vacant	Possess
29	Remember	Recollect	Forget
30	Rude	Impolite	Polite
31	Secret	Private	Open/public
32	Severe	Serious	Light
33	Savage	Barbarous	Civilized
34	Sympathy	Compassion	Cruelty

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35	Tedious	Boring	Lively
36	Thrifty	Economical	Prodigal
37	Thrive	Prosper	Ruin
38	Transparent	Clear	Opaque
39	Useful	Serviceable	Useless
40	Variety	Diversity	Monotony

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CS-02: PROBLEM SOLVING METHODOLOGIS AND PROGRAMMING IN C				
Sr. No.	Topics	Detail	Mark	Min. Lect.
1	Pre Programming Techniques	Importance of preprogramming techniques Pre programming tools <ul style="list-style-type: none"> ○ Algorithms ○ Flowcharts Dry run (preparation of sample data set for testing of logic) Writing algorithms and development of flowcharts with dry run for the given list of problems.	20	12
2	Getting Started With C	C Program structure C Character Set Constants, Variables and Keywords in C Various Data Types Type Casting Various Operators Hierarchy of operations	80	6
3	Various Control Structures	Decision <ul style="list-style-type: none"> ○ if, if-else, Nested if-elses, if-elseif ○ Conditional (Ternary) operator ○ Switch case Loops For, while, do while, Nesting of loops Use of break and continue statements Goto with label		14
4	Header files & Library Functions	Importance of header files Introduction to some popular header files and its library functions; <stdio.h> : printf(), scanf(), fflush(), gets(), puts() <conio.h>: getch(), getche(), getchar(), clrscr(), gotoxy(), textcolor(), textbackground(), cprintf() <math.h>:abs(), exp(), sqrt(), log(), ceil(), floor(), pow(),fmod(),fabs() <string.h>: strlen(), strcpy(), strcmp(), strcat(), strlwr(),strupr(),strrev() <ctype.h> : isalpha(), isdigit(), isalnum(), isspace(), isupper(), islower(), isprint(), toupper(), tolower()		8

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5	User defined functions	Different types of UDFs (Call By Value Only) <ul style="list-style-type: none"> ○ Functions with No argument, No return value ○ Functions with No argument, with return value ○ Functions with argument, No return value ○ Functions with argument, with return value Creation of your library Storage classes & Scope of variable		5
6	Arrays	Concept of Single and two dimensional arrays Initialization and working with array Passing array elements to function Sorting of numeric and string arrays String operations		8
7	Structure	How to define a structure Accessing structure elements Memory Allocation Array of structure Array within structure Union		5
8	MISC.	Typedef Symbolic Constants C Preprocessor <ul style="list-style-type: none"> ○ #define ○ #include 		2
			100	60

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List of sample problems.

Write an algorithm, draw a flowchart and prepare a dry run to solve the following problems:

1. To print "Hello World"
2. To make sum of the Numbers 5 and 10 and print it.
3. To make addition, subtraction, multiplication & division of a=15 b=3
4. Enter 2 values & swap it.
5. Input P,R,N. And calculate simple interest and compound interest.
6. To calculate & print area & circumference of circle. ($A = \pi * R^2$)
($C = 2 * \pi * R$)
7. To calculate & print volume of Cone. ($V = 1/3 * \pi * R^2 * H$)
8. To calculate & print area & Volume of Sphere. ($A = 4 * \pi * R^2$) ($V = 4/3 * \pi * R^3$)
9. To calculate & print Volume of Cylinder. ($V = \pi * R^2 * H$)
10. To read 2 Numbers and print the sum of it.
11. To read any three numbers and print its sum and average value.
12. To print first 10 numbers.
13. To print the sum of first 10 numbers
14. To print the odd numbers from first 10 numbers.
15. To print even numbers from first 10 numbers.
16. To check whether any number is odd or even.
17. Enter a number than check out whether it is prime or not. Display appropriate message.
18. To print the prime numbers from first 100 numbers. (Explain the definition of prime numbers to the students)
19. To print the factorial of any number (Explain how to calculate factorial)
20. To print larger number from any two numbers.
21. To print largest number from any three numbers.
22. To print largest number from any 10 numbers.
23. To test whether a particular number is positive, negative or zero.
24. To count and print the no. of positive values, no. of negative values and no. of zeros from 10 different values.
25. Modify problem no. 15 to print the average value of positive nos. and negative nos. also.
26. To print the sum of the following series.
 - a. Sum= $1! + 2! + 3! + 4! + \dots + N!$ (Where ! means factorial, N means any value, you want)
 - b. Sum= $1 + 1/2 + 1/3 + 1/4 + 1/5 + \dots + 1/N$
 - c. Sum= $1/1! + 1/2! + 1/3! + 1/4! + \dots + 1/N!$
 - d. Sum= $1 - 2 + 3 - 4 + 5 - 6 + 7 - \dots + N$
 - e. Sum= $1^2 + 2^2 + 3^2 + 4^2 + 5^2 + \dots + N^2$
 - f. Sum= $1/1^2 - 1/2^2 + 1/3^2 - 1/4^2 + 1/5^2 - \dots + 1/N^2$
 - g. Sum= $1 \times 2 / 2 \times 3 + 2 \times 3 / 3 \times 4 + 3 \times 4 / 4 \times 5 + \dots + N$ terms

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- h. Generate a fibonacci series : 1, 1, 2, 3, 5, 8, 13,....
(sum of first two element is third element, sum of second third element is fourth element & so on....)

27. Accept marks of three subjects for student & calculate total marks and percentage.
Also find class according to following rules.

percentage	class
≥ 70	distinction
≥ 60 & < 70	first class
≥ 50 & < 60	second class
≥ 40 & < 50	pass class
< 40	fail class

28. Accept Basic Salary of employee & calculate net salary, according to following rules.

Allowances:

DA	52% of Basic
HRA	10% of Basic
MA	10% of Basic
LTC	10%
Vehicle Allowance	5% of Basic
Gross salary = basic + da + hra + ma + ltc + va	

Deductions :

Loan	Rs.1000/- fixed
PF	10% of Basic salary

Net salary = Gross salary – (loan + PF)

Reference book:

- 1. Programming in ANSI C** Author : E. Balaguruswami
- 2. Let Us C** Author : Yashwant Kanetkar
- 3. Working with C** Author: Yashwant Kanetkar
- 4. Programming in C** Schaum Series publication

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CS-03 : Computer Fundamentals And Emerging Technology				
No.	Topic	Detail	Marks	Min. Lect.
1	Computer Basics	Definition of computer Block Diagram Of Computer Characteristics of computer Generations of computer Analog computer Digital computer Mini, Micro, Mainframe, Super Hybrid computer	5	3
2	Number Systems, Binary Arithmetic And Codes And Data Representation	Conversions Decimal to Binary, Octal, Hexadecimal Binary to Decimal, Octal, Hexadecimal Octal to Decimal, Binary, Hexadecimal Hexadecimal to Decimal, Binary, Octal Complement 1's complement 2's complement Addition of two binary numbers Subtraction of two binary numbers using 1's and 2's complement method ASCII, BCD, and EBCDIC Where and why these codes are used? Introduction Nibble Bit Byte Carry Bit Parity Bit Sign Bit Word 1. Double Word	20	12

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		2. Quad word		
3	Computer Peripherals	<p>Input Devices Key board Mouse Touch screen Scanner OCR, OMR, MICR And OBR Light pen</p> <p>Output Devices(ALL) CRT LCD Plasma</p> <p>Printers Impact Non Impact</p> <p>Storage Devices And Type Of Memory RAM (With Architecture), ROM,PROM, EPROM, EEPROM Cache Memory Magnetic Tape Magnetic Disk CDs DVD, Blu-Ray Disc Pen drive</p> <p>Port Introduction USB, Serial, Parallel and PS2</p>	25	15
4	Overview Computer Languages And Operating System	<p>Machine level language Assembly level language High-level language Note: There is no any comparison in between these languages.</p> <p>Definition of assembler, Compiler and interpreter</p> <p>Definition of Operating System Concept of Batch OS,</p>	10	5

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		Multiprogrammed OS, Time Sharing OS, On-Line OS And Real Time OS		
5	Emerging Technology	Optical Fiber Introduction Principle of optical fiber Applications (Related to Communication) GIS GPS Remote Sensing Cell Phone Introduction of CDMA and GSM Introduction of Duplex 1. Half Duplex 2. Full Duplex Cell Phone Frequency Cell Phone Network Cell Phone Channel Blue tooth Introduction Creating Connection Piconets Security Wi-Fi Introduction Hot Spot Virus Introduction Origin, History and Evolution Types of Virus Protection from Virus	40	25
			100	60

Students seminar - 5 Lectures.
 Expert Talk - 5 Lectures
 Students Test - 5 Lectures.
Total Lectures 60 + 15 = 75

Reference Books:

- 1) Computer Fundamentals – By P.K.Sinha

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- 2) Fundamental of IT for BCA – By S.Jaiswal
- 3) Engineering Physics – By V.K.Gaur
- 4) Electronics Communication – By Robert J. Schoenbeck
(Modulation And Transmission) : Charles E. Merrill Universal Book Stall
New Delhi
- 5) Teach Yourself Assembler – By Goodwin

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CS-04: NETWORKING & INTERNET ENVIRONMENT				
Sr. No.	Topics	Detail	Mark	Min. Lect.
1	Networking Basics	Concept And Objectives Advantages Of Networking Components Of Network Types Of Network (LAN, MAN, WAN) Network Services	10	5
2	Internet Basics	Introduction To Internet And Intranet Internet Applications & Services <ul style="list-style-type: none"> ○ E – Mail ○ Internet News ○ Chatting ○ Voice And Video-conferencing ○ Online Services (AOL, Compuserve, MSN) Types Of Accounts (Brief) TCP/IP And Shell ISP (Internet Service Provider) Internet Connection Types (H/W And S/W Requirement) <ul style="list-style-type: none"> ○ Dial – Up ○ Lease Line ○ ISDN ○ ADSL ○ Cable Modem Internet Addressing <ul style="list-style-type: none"> ○ What Is Internet Addressing? ○ IP Address ○ Domain Name ○ URL (Uniform Resource Locator) 	20	15

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3	WWW (World Wide Web)	<p>Elements Of Web</p> <ul style="list-style-type: none"> ○ Web Page ○ Web Site ○ Web Client / Web Browser ○ Web Server <p>Introduction To Web Languages</p> <ul style="list-style-type: none"> ○ Html / DHTML ○ Java Script And VB Script ○ XML ○ VRML ○ WML ○ PHP <p>Web Searching</p> <ul style="list-style-type: none"> ○ Web Index ○ Web Search Engine ○ Web Meta Search Engine <p>Cookies</p> <p>Firewall</p> <p>Hacking & Cracking</p> <p>Virus</p> <p>Cryptography</p> <ul style="list-style-type: none"> ○ Public Key, Private Key ○ Digital Signature ○ Digital Certificate 	20	15
4	Building small web based application using HTML	<p>Use Of Html Document</p> <p>Html Document Structure</p> <p>Various Html Tags</p> <p>Document Tag</p> <ul style="list-style-type: none"> ○ <Html></Html> ○ <Head></Head> ○ <Body></Body> ○ <Title></Title> ○ <!-- --> <p>Text Formatting Tag</p> <ul style="list-style-type: none"> ○ <H1></H1> To <H6></H6> ○ <P></P> ○ <Pre></Pre> ○ ,<U></U>,<I></I> ○ <Tt></Tt> ○ <Strike></Strike> ○ <Sub></Sub> ○ <Sup></Sup> ○ <Big></Big> ○ <Base> ○ 	30	15

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 ○ <Hr> <p>List Creation</p> <ul style="list-style-type: none"> ○ ○ ○ ○ <Dl></Dl> ○ <Dt> ○ <Dd> <p>Image Handing In Html</p> <ul style="list-style-type: none"> ○ ○ <Area></Area> ○ <Map></Map> <p>Table Creation</p> <ul style="list-style-type: none"> ○ <Table></Table> ○ <Tr> ○ <Th> ○ <Td> ○ <Caption> <p>Frames</p> <ul style="list-style-type: none"> ○ Frame ○ Frameset <p>Forms</p> <ul style="list-style-type: none"> ○ Form ○ Input ○ Select ○ Option ○ Textarea 		
5	FRONT PAGE	Overview of Microsoft’s Front Page, Front Page Explorer, Working with front page webs Web components: Book mark, Hyperlink, Hover button, Hit counter, Marquee, Banner and Manager, Scheduled Picture	20	10
Total:			100	60

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 Expert Talk – 5 Lectures
 Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

- | | |
|--|--------------|
| 1. Internet The Complete Reference | -Young |
| 2. World Wide Web Design With Html | -C Xavier |
| 3. Internet For Every One | -Leon |
| 4. Practical Html 4.0 | -Lee Philips |
| 5. MCSE Networking Essential Training Guides | |
| 6. Mastering In FrontPage | - BPB |

CS-05 : Practical And Viva Based On PC Software & CS – 4		
Sessions	Topics	Marks
I	PC Software MS – Word MS – Excel MS – Power Point CS – 4	50

CS-06 : Practical And Viva Based On CS – 2		
Sessions	Topics	Marks
II	CS - 2	50

Note :

- Each session is of 3 hours for the purpose of practical Examination.
- Practical examination may be arranged before or after theory exam

Additional Topics (Not to be asked in exam) :

Student should be aware of followings

- To Write CD
- To Format Hard Disk
- Installation of OS and other packages
- Use of DOS commands

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SR.NO.	SUBJECT	NO. OF THEORY LECT. PER WEEK	NO. OF PRACTICAL PER WEEK
1	CS – 07 ADVANCE C & DATA STRUCTURE	4+1	6
2	CS – 08 DBMS USING FOXPRO	4+1	6
3	CS – 09 COMPUTER ORGANIZATION & ARCHITECTURE	4+1	-
4	CS – 10 MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE	4+1	-
5	CS – 11 PRACTICALS (BASED ON CS-07)	-	As mentioned against Sr. No. 1
6	CS – 12 PRACTICALS (BASED ON CS-08)	-	As mentioned against Sr. No. 2

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CS-07: Advance C and Data structure					
No	Topic	Details	Marks	Min Lect.	
1.	Pointer	Definition and Concept Advantage of using pointer Pointer arithmetic Array and pointer Static and dynamic array Pointer to structure	30	08	
2.	UDF	Void data type Call by value and call by reference function Recursion Array as a function argument Structure as a function argument Pointer as a function argument		05	
3.	Sorting and Searching techniques	Selection sort Insertion sort Bubble sort Quick sort Merge sort Linear search Binary search		05	
4.	Data file handling	Concept of data file and FILE structure Text file and binary file Opening and closing of data file [fopen(), fclose()] Write data/record to a data file [fprintf(), fwrite(), fputs()] Reading from data file [fscanf(), fread(), fgets()] File handling functions [feof(), ferror(), fseek(), ftell(), rewind()] Command line argument		08	
5.	Data structure	Primitive and non-primitive Storage structure for array , structure and array of structure		70	04
6.	Stack	Definition and concept Operation on stack Application of stack in recursion			05

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7.	Queue	Definition and concept Operation on queue Circular queue		05
8.	Linked list	Definition and Concept Operation on linked list o Insertion at different position o Deletion from different position o Traversal Types of linked list: o Singly linked list o Circular clinked list o Header linked list o Doubly linked list Sorting and Searching in Linked list		15
9.	Tree	Definition and concept, Operation on binary tree (create, traverse) (pre, post, in)		05
			100	60

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.

Total Lectures 60 + 15 = 75

Reference Books:

1. Data Structure through C/C++ Author : Tennaunbuam
2. Data Structure Author : R. B. Patel
3. Let us C Author : Kanitkar
4. Pointer in C Author : Kanitkar
5. Data and File Structure Author : Trembley & Sorrenson

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CS-08: DBMS Using FOXPRO				
No.	Topics	Detail	Mark	Min. Lect.
1	DBMS Concepts	Characteristics and Use of DBMS Data Models (Hierarchical, Network, Relational) Entity and Relationships, E – R Diagram Popular DBMS software's	10	5
2	FoxPro Basics	Types of files: Command file (Creation, Modification, Execution), Database file, Report file, Label file, Index file. Data types: Numeric, Character, Logical, Date, Memo, Float, General. Operators and Expressions: Arithmetic, Relational, Logical.	90	5
3	Creating, Editing, Updating Database file commands	Create, Use [Index], Append [Blank, From] Insert [Before, Blank] Go [Record, Top, Bottom], Skip List [Off, Fields, Next, For, While, To Printer, To File] Display [Fields, For, While, Off, To Printer] Edit [Fields, For, While, When] Browse [Fields, Freeze, For, When, Noedit, Nodelete, Nomodify] Delete [All, Next, Record, For, While] Recall [All, Next, Record, For, While] Pack, Zap Update, Replace Locate [For, While], Continue [For, While] Sum [For, While], Average [For, While], Total Close [All, Databases, Indexes] Scatter, Gather	12	12
4	Sorting, Indexing and Multiple file handling commands	Sort Index, Reindex Find, Seek Select	07	07

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5	Library Functions	<p>Numeric Functions: Abs(), Between(), Ceiling(), Floor(), Int(), Min(),Max(), Mod(), Round(), Sqrt(), Rand(), Sign()</p> <p>Date And Time Functions: Date(), Time(), Day(), Dow(), Month(), Year(), Dtoc(), Ctod(), Cdw(), Cmonth(), GoMonth()</p> <p>File And Record Related Functions: Recno(), Reccount(), Bof(), Eof(), Found(), Deleted()</p> <p>Character, String And Other Functions: Chr(), Asc(), Val(), Left(), Right(), Str(), Substr(), Len(), Lower(), Upper(), Trim(), Rtrim(), Alltrim(), Stuff(), Isupper(), Islower(), Isalpha(), Isdigit(), Soundex(), Set(), Parameter()</p>	06
6	Set Commands	Alternate, Carry, Confirm, Color To, Console, Date, Default, Decimal, Device, Delimiters, Exact, Filter, Fixed, Function, Index, Order, Print, Relation, Safety, Status, Talk, Message, Mark, Century, Deleted, Skip, Procedure, Heading, Clock, Field	05
7	Input/Output, Initializing, assigning and other commands	?, ??, ??? . *. &&. Note, = Accept, Input, Store, Read @ Say ... Get [Picture, Range, Valid, Default, Message, Error] @ ... To, @ ... Box, @ ... Fill, @ ... Prompt With Message Wait, Private, Public, Clear, Exit, Loop Dimension Command (One Dimension And Two Dimension)	05
8	Conditional and Branching commands	If ... Else ... Endif (With Nesting) Do Case ... Endcase	05
9	Looping commands (with nesting)	For ... Endfor Do ... Enddo Scan [For, While] ... Endscan	05
10	Procedure related commands	Creation Of Procedures Procedure, Parameter, Return, Suspend, Resume, Cancel Execution Of Procedures (Do[With])	05

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11	Programming Exercise	Programming Exercises that covers all above specified commands and functions Programming Exercises using Databases.		
Total:			100	60

Students seminar - 5 Lectures
Expert Talk - 5 Lectures
Students Test - 5 Lectures

Total Lectures 60 + 15 = 75

Hands On (Not to be asked in examination):

- Case Studies of Real Business Application like Library, Hospital, Inventory,
- Hotel, Banking, Payroll, Student Administration
- Program for Adding, Viewing, Deleting and Modifying Records
- Creating Screens, Windows, Reports, Labels

Reference Books

- **Foxpro 2.5 Made Simple** by R. K. Taxali, BPB Publication
- **Programming in Foxpro 2.6** by Gagan Sahoo, Khanna Publication
- **An introduction to Database Concepts** by Bipin Desai, Galgotia Publication
- **Database System Concepts** by Silberchatz and Korth, TMH Publication
- **Database Management System Concepts** by C. J. Date

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CS-09: Computer Organization And Architecture				
No.	Topic	Detail	Marks	Min. Lect.
1	Digital Logic Circuits	<p>Logic Gates AND,OR,NOT,NAND,NOR,XOR,Exclusive NOR gates</p> <p>Boolean Algebra What is Boolean algebra? Explanation about Boolean variable and Boolean function (Analog and Digital Signals) Describe truth table Discuss postulates Discuss Theorem related to postulates Simplified Boolean function using postulates and draw logical diagram of simplified function Simplified Boolean function using karnaugh map method and discuss DON'T CARE condition</p> <p>Sequential And Combinational Circuits What are Clock pulses? What is combinational circuit and sequential circuit after discussion of adders and flip flops</p> <p>Flip Flops SR, Clocked SR, D, JK, JK – Master Slave, T</p> <p>Universal Gate Why it is called universal gate-Explain</p>	20	15
2	Digital Component	<p>Integrated Circuits Decoders (2 X 4, 3 X 8) Encoders (Octal to Binary – 8 X 3) Multiplexer (4 X 1) Demultiplexer (1 X 4)</p> <p>Register Block diagram of register How it works? Parallel register and shift register How it transfer data?</p>	25	15

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		Asynchronous 4-bits Binary Counter		
3	Data Representation	Multiplication and division of two binary numbers Floating point representation Fixed point representation Error Detection code – (Parity Bit)	10	8
4	Central Processing Unit	Introduction Of CPU Major component of CPU General Register Organization What is control word? Accumulator Register Stack Organization What is register stack? What is memory stack? What is polish notation and reverse polish notation? Why we use polish notation? – explain with an example Arithmetic And Logic Unit Block diagram of ALU Explain how it works Interrupts What is interruption? How it useful and work?	25	7
5	Input-Output Organization	Memory buses Explain with block diagram How it works? Data Bus, Address Bus and Control lines Input Output Buses Concept of input output interface Input Out Processor (IOP) Direct Memory Access Introduction How DMA works? Explain DMA controller How DMA transfer data in computer system	20	15
			100	60

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Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.
Total Lectures 60 + 15 = 75

Reference Books:

- 1) Computer System Architecture – By Morris Mano (PHI)
- 2) Digital Logic And Computer Design – By Morris Mano
- 3) Digital Computer Electronics – By Malvino And Leach

Hands On (Not to be asked in examination):

- Instruction Formats
- Simulator Base Program

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CS-10: MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE				
Sr. No.	Topics	Detail	Mark	Min. Lect.
1	Set Theory	Introduction to Set Theory Methods of representation of a Set Operations on Set and its Properties (With logical and Venn diagrammatic proofs) De'Morgans Laws with logical proof Cartesian Product (Up to Two Sets) Typical Examples	15	8
2	Linear Correlation and Regression	Meaning Types of correlation Scatter diagram method Karl-Pearson method Meaning of Regression Typical Examples	15	10
3	Co-ordinate Geometry	Introduction to Co-ordinates Quadrants And Lines Distance between two points in R^2 (Without Proof) Section Formula (Without Proof) Area of Triangles (Without Proof) Equation of Straight Line General Equation of Line (With Proof) <ul style="list-style-type: none"> a. Origin Slope Form b. A line Intercepting ths Axes c. Slope Intercept Form d. Two Intercept Form e. Slope Point Form Parallel and Perpendicular Lines Typical Examples	15	10

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4	Business Forecasting	Meaning and uses of Business forecasting Method of Forecasting Least Square Method ($y = a + bx$) ($y = a + bx + cx^2$) ($y = ab^x$) Method of Moving Averages Method of exponential Smoothing Concept of Input Output analysis Typical Examples	20	10
5	Arithmetic, Geometric, Harmonic Progression	Sequence, Series Arithmetic Progression <ul style="list-style-type: none"> ○ Definition ○ N^{th} Term, Sum of n terms Geometric Progression <ul style="list-style-type: none"> ○ Definition ○ N^{th} Term, Sum of n terms Arithmetic Mean, Geometric Mean, Harmonic Mean Harmonic Progression Relation between A.M., G.M. and H.M. with proof (Only for Two Numbers) Typical Examples	20	12
6	Statistical Quality Control	Meaning and uses of SQC Base of control limits Control limits for variable charts (Mean and Range chart) Control limits for attribute charts (p, np and c chart) Difference between variable chart and attribute chart	15	10
Total:			100	60

Student Seminar – 5 Lectures
Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

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Reference Books:

Business Mathematics	By Sancheti & Kapoor	Sultan & Chand
Statistical Method	By Gupta	Sultan & Chand
Discrete Mathematical Structures with Applications to Computer Science		
By J.P. Tremblay & R. Manohar		TMH

CS-11 : Practical And Viva Based On CS – 6		
Sessions	Topics	Marks
I	CS - 07	50

CS-12 : Practical And Viva Based On CS – 6		
Sessions	Topics	Marks
I	CS – 08	50

Note :

- Each session is of 3 hours for the purpose of practical Examination.
- Practical examination may be arranged before or after theory exam

Additional Topics (Not to be asked in exam) :

Following tools should be used to train students.

- Simulator 8051
- Using Trainer kit
- Case studies of DBMS
- Case studies of data structure