KANNUR UNIVERSITY

COURSE STRUCTURE AND SYLLABUS

for

UNDERGRADUATE PROGRAMME

In

COMPUTER APPLICATION

CORE & OPEN COURSES

Under

CHOICE BASED CREDIT AND SEMESTER SYSTEM

w. e. f. 2014 ADMISSION

General Guidelines, Curricula, Syllabus and Scheme of examinations for BCA Programme w.e.f 2014 admission onwards

BCA, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Application as core subject with one complementary subject (Mathematics). The duration of the programme is six semesters distributed over a period of three years. A semester consists of 90 working days including examination days distributed over a minimum of 18 weeks of five working days each.

COURSES

The number of courses required to complete the programme shall be 40. 'Course' means a segment of subject matter to be covered in a semester (traditionally referred to as paper). The courses include Common Courses including General Course, Complementary Course, Core Course and Open Course. The break-up of the courses is as follows:

Course Type	Total Numbers
Common courses (English + Additional language)	06
Common courses (General)	04
Complementary	04
Core	25
Open Course	01
Total	**40**

BCA - Course Structure

Semester –I

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course English I	5		4	50
2	Common course English II	4		3	50
3	Common course Additional Language I	5		4	50
4	Complementary I - Mathematics I	4		3	50
5	Common course - Informatics for Computer Application	3		4	50
6	Core course 1 - Programming in C	2	2	2	50
	Total	**23**	**2**	**20**	**300**

Semester –II

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course English III	5		4	50
2	Common course English IV	4		3	50
3	Common course Additional Language II	5		4	50
4	Complementary II - Mathematics II	4		3	50
5	Core course 2 -Digital Systems	3		2	50
6	Core course 3–Object Oriented Programming Using C++	2		3	50
7	Core course 4 -Lab – I (Programming in C)			2	25
8	Core course 5 -Lab –II (Programming in C++)		2	2	25
	Total	**23**	**2**	**23**	**350**

Semester –III

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course – Data Structure	4	3	4	50
2	Common course – Data Base Management System	4	2	4	50
3	Complementary III - Mathematics III	4		3	50
4	Core course 6 -Computer Organization	4		3	50
5	Core course 7 -Introduction to Microprocessors	4		3	50
	Total	**20**	**5**	**17**	**250**

Semester –IV

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Common course - Numerical Analysis	4		4	50
2	Complementary IV - Mathematics IV	4		3	50
3	Core course 8 - Operating system	4		3	50
4	Core course 9 -Java Programming	4		3	50
5	Core course 10 -Linux Administration	4		3	50
6	Core course 11- Lab –III Data Structure & DBMS			3	25
7	Core course 12 Lab – IV Java Programming, Shell Programming and Linux Administration		5	3	25
	Total	**20**	**5**	**22**	**300**

Semester –V

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course 13 - Software Engineering	4		3	50
2	Core course 14 - Data Communication & Networks	4		3	50
3	Core course 15 - Enterprise Java Programming	4	4	3	50
4	Core course 16 - C# and .Net Programming	3	4	2	50
5	Open course	2		2	25
	Total	**17**	**8**	**13**	**225**

Semester –VI

No.	Title of the Course	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course 17 - Web Technology	2		2	50
2	Core course 18 - Data Mining & Data Warehousing	4		3	50
3	Core course 19 - Elective I	4		3	50
4	Core course 20 - Elective II	4		3	50
5	Core course 21 - System Software	3		2	50
6	Core course 22 - Lab – V Enterprise Java Programming			3	25
7	Core course 23 - Lab – VI .Net Programming			3	25
8	Core course 24 - Lab – VII Web Technology		3	2	25
9	Core course 25 - Lab – VIII Project		5	4	50
	Total	**17**	**8**	**25**	**375**

Common course:

Means a course that comes under the category of courses, including compulsory English and additional language courses and a set of general courses. There are 10 common courses for the BCA programme. This includes four English courses (two courses each in first and second semesters), two additional language courses (one course each in first and second semesters) and four General courses (one in first semester, two in third semester and one in fourth semester). The syllabi of general courses include the topics related to Computer Application.

Complementary Course:

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There is one Complementary subject for BCA programme. The total number of Complementary courses offered for BCA shall be FOUR. Complementary courses are offered during first to fourth semesters.

Core course:

Means a compulsory course in a subject related to a particular degree programme. The core subject Computer Application consists of 17 theory papers,7 practical papers and 1 project work. The semester wise list of Core and General Courses is given in the following tables.

Open course:

Means a course which can be opted by a student at his/her choice. There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. For the purpose of open course B.Sc Computer Science and BCA should be considered as a single department. The students can opt for that course from any other department in the institution. Each department can decide the open course from a pool of three courses offered by the university. A department can offer only one open course in one semester.

Scheme Core, General and Open - Courses (BCA)

S.No	Sem	Course Code	Course Name	Hours/Week		Credits
				Theory	Practical	
1	I	1A11BCA	Informatics for Computer Application	3		4
2	I	1B01BCA	Programming in C	2	2	2
3	II	2B02BCA	Digital Systems	3		2
4	II	2B03BCA	Object Oriented Programming Using C++	2		3
5	II	2B04BCA	Lab – I Programming in C			2
6	II	2B05BCA	Lab – II Programming in C++		2	2
7	III	3A12BCA	Data Structure	4	3	4
8	III	3A13BCA	Database Management System	4	2	4
9	III	3B06BCA	Computer Organization	4		3
10	III	3B07BCA	Introduction to Microprocessors	4		3
11	IV	4A14BCA	Numerical Analysis	4		4
12	IV	4B08BCA	Operating System	4		3
13	IV	4B09BCA	Java Programming	4		3
14	IV	4B10BCA	Linux Administration	4		3
15	IV	4B11BCA	Lab–III Data Structures and DBMS			3
16	IV	4B12BCA	Lab–IV Java Programming, Shell Programming and Linux Administration		5	3

17	V	5B13BCA	Software Engineering	4		3
18	V	5B14BCA	Data Communication & Networks	4		3
19	V	5B15BCA	Enterprise Java Programming	4	4	3
20	V	5B16BCA	C# and .Net Programming	3	4	2
21	V	5D - -BCA	Open Course	2		2
22	VI	6B17BCA	Web Technology	2		2
23	VI	6B18BCA	Data Mining & Data Warehousing	4		3
24	VI	6B19BCA	Elective I	4		3
25	VI	6B20BCA	Elective II	4		3
26	VI	6B21BCA	System Software	3		2
27	VI	6B22BCA	Lab – V Enterprise Java Programming			3
28	VI	6B23BCA	Lab – VI .Net Programming			3
29	VI	6B24BCA	Lab – VII Web Technology		3	2
30	VI	6B25BCA	Lab – VIII Project		5	4

Scheme of Open course for 5th semester

Sl. No.	Sem	Course Code	Name of the Course	Hours / Week	Credit
1	V	5D01BCA	Programming with C	2	2
2	V	5D02BCA	Web Technology	2	2
3	V	5D03BCA	Database Management System	2	2

Electives:

Course 6B19BCA shall be selected from Section A and Course 6B20BCA shall be selected from Section B

No	Sem	Course Code	Course Name	Hours/Week	Credits
SECTION A					
1	VI	6B19BCA - E01	Information Security	4	3
2	VI	6B19BCA - E02	Information Storage System	4	3
3	VI	6B19BCA - E03	Mobile Communications	4	3
SECTION B					
4	VI	6B20BCA - E04	Algorithm Analysis and Design	4	3
5	VI	6B20BCA - E05	Network Programming	4	3
6	VI	6B20BCA - E06	Digital Image Processing	4	3

CREDITS

Each course shall have certain credits. For passing the BCA programme the student shall be required to achieve a minimum of 120 credits of which 38 credits (14 credits for English courses, 8 credits for Additional language courses and 16 credits for General courses) shall be from common courses. Minimum credits required for core, complementary and open courses put together are 82.

CREDIT DISTRIBUTION (LRP- BCA)

SUBJECT	SEMESTER	COMMON		GENERAL	CORE	COMPLEMENTARY	OPEN	TOTAL
		ENGLISH	ADDITIONAL		Computer Application	Maths		
COMPUTER APPLICATION	I	4+3	4	4	2	3	----	**20**
	II	4+3	4	----	2+3+2+2	3	----	**23**
	III	----	----	4+4	3+3	3	----	**17**
	IV	----	----	4	3+3+3+3+3	3	----	**22**
	V	----	----	----	3+3+3+2	----	2	**13**
	VI	----	----	----	2+3+3+3+2+3+3 +2+4	----	----	**25**
	TOTAL	**14**	**8**	**16**	**68**	**12**	**2**	**120**

ATTENDANCE

Minimum 75% attendance is compulsory for theory as well as practical courses, failing which a student is not eligible to appear for university examinations.

SEMINARS / ASSIGNMENTS

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

PROJECT WORK

Every student of BCA Programme shall have to work on a project of four credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation (Project) at the end of sixth semester. Individual projects are recommended but in an instance where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to **FOUR**.

RECORDS

A record is compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works.

COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

1. Internal Assessment (IA)
2. External Evaluation (End Semester Evaluation ESE)

20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The distribution of marks for each course is given in following table:

Scheme of mark distribution of BCA programme

Courses		No of Courses	Marks Per Course			Total Marks
			Int	Ext	Total (Int + Ext)	
Common	English	4	10	40	50	200
	Addl. Language	2	10	40	50	100
	General	4	10	40	50	200
Complementary	Mathematics	4	10	40	50	200
Core	Theory	17	10	40	50	850
	Practical	7	5	20	25	175
	Project	1	10	40	50	50
Total						**1800**

Internal Assessment:

20% of the total marks in each course are for internal assessment. The marks secured for internal assessment only need be sent to university by the colleges concerned. The internal assessment shall be based on a predetermined transparent system involving written test, assignments/ seminars/ Viva and attendance in respect of theory courses and submissions and records, tests and attendance in respect of practical courses. Components with percentage of marks of Internal Evaluation of Theory Courses are-

Attendance	- 25%
Assignment/ Seminar/Viva	- 25%
Test paper	- 50%

For practical courses-

Attendance	- 25%
Submissions and Record	- 25%
Practical Test Paper	- 50%

(If a fraction appears in total internal marks, nearest whole number is to be taken)

Attendance of each course shall be evaluated as below

Attendance %	% Marks Allotted
Above 90%	100%
85 to 89%	80%
80 to 84 %	60%
75 to 79 %	40%
Less than 75%	Not eligible for University exam

Theory External Evaluation:

External evaluation carries 80% of marks. All question papers shall be set by the university. The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined Scheme of valuation and answer keys provided by the University. Details regarding the End Semester Evaluation of core and open courses are

given below:

1. **Core Courses**

- Maximum Marks for each course - **40** Marks
- Duration of examination - **3** Hrs.

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
1	A bunch of 8 one word answer questions	0.5	08/08	4
2	Short answer	2	07/10	14
3	Short Essay /Programs	3	04/6	12
4	Essay Type	5	02/4	10

2. Open Course

- Maximum Marks for open course - **20** Marks
- Duration of examination - **2** Hrs.

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
1	A bunch of 8 one word answer questions	0.5	08/08	4
2	Short answer	2	03/05	6
3	Short Essay /Programs	3	02/04	6
4	Essay Type	4	01/02	4

External Evaluation Practical

External evaluation carries 80% of marks. All question papers shall be set by the

university. The external examination in practical courses shall be conducted by **TWO** external examiners appointed by the University. No practical examination will be conducted in odd semester. Practical examinations shall be conducted in the even semester (II, IV and VI). The Scheme of Examinations and Model Question Papers of all the theory and practical courses offered under core, general and open courses are include in the detailed syllabus. Practical examination assessment of different components may be taken as below.

Components	Part A	Part B
Program writing	3	3
Compilation/Execution (without errors)	2	2
Correct Output	2	2
Modification	1	1
Viva-voice	2	2
Total	**10**	**10**

Project Evaluation

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal (20% of the total)				External (80% of Total)		
Components	**% of Marks**	**Marks**		**Components**	**% of Marks**	**Marks**
Punctuality	20	02		Written Synopsis/Abstract	12.5	5
Relevance of topic System study / Design of tables	20	02		Content of the Project	12.5	5
				Quality of project work/Use of software/ tools	12.5	5
				Perfection of the work (Designs of tables/ Input & Output forms)	25	10
				Live demo	12.5	5
Project Report	30	03		Viva-Voce	25	10
Presentation & Viva-voce	30	03				
Total	**100**	**10**		**Total**	**100**	**40**

External Examiners will be appointed by the University in consultation with the Chairperson of the Board. Project evaluation shall be done along with the external examination of Core Practical lab IV & V in sixth semester.

Pass Conditions:

Submission of the project report and presentation of the student for viva are compulsory for the evaluation. No marks shall be awarded to a candidate if she/he fails to submit the project report for external evaluation. The student should get a minimum of 40 % marks for pass in the project. There shall be no improvement chance for the Marks obtained in the Project Report. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

1A11BCA

INFORMATICS FOR COMPUTER APPLICATION

Hours per Week : 3 **Credits : 4**

Objectives

- *To review the basic concepts & functional knowledge in the field of informatics.*
- *To review functional knowledge in a standard office package and popular utilities*
- *To create awareness about nature of the emerging digital knowledge society*
- *To create awareness about social issues and concerns in the use of digital technology*
- *To impart skills to enable students to use digital knowledge resources in learning.*

Course Outline

Module I : (Ref Essential reading 1)

Computer basics ; Evolution, generation and classification of computers. Computer Organization and Architecture : CPU; Communication among various units; Instruction format; Instruction cycle; Instruction set; Data representation; coding schemes. Computer memory and Storage : Memory hierarchy; RAM; ROM; secondary storages-magnetic, optical and magneto-optical storage devices. Mass storage devices.

Module II : (Ref Essential reading 1)

Input output devices -Types of I/O devices. Software : definition; categories; software terminologies. Operating system : introduction, definition, evolution; types; functions.

Module III : (Ref Essential reading 1)

Computer Programming and languages (Introduction only) : Algorithm; Flow chart; Pseudo code; Program control structures; Programming paradigm; Programming languages; Generation of programming languages.

Module IV - KNOWLEDGE SKILLS FOR HIGHER EDUCATION

Data, information and knowledge, knowledge management- Internet access methods – Dial-up, DSL, Cable, ISDN,Wi-Fi - Internet as a knowledge repository, academic search techniques, open access initiatives, open access publishing models. Basic concepts of IPR, plagiarism, introduction to use of IT in teaching and learning,

Module V - SOCIAL INFORMATICS

IT & Society- issues and concerns- digital divide, IT & development, the free software movement , cyber ethics, cyber crime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, guide lines for proper usage of computers, internet and mobile phones.

Note : a Practical / demonstration sessions may arranged for selected topics.

b. Self study / seminars / group discussion shall be encouraged for this course.

Essential Reading

1. Introduction to information Technology, ITL Education solutions, Pearson Education
2. V. Rajaraman, Introduction to Information Technology, Prentice Hall
3. Technology in Action, Pearson
4. Alexis Leon & Mathews Leon, Computers Today, Leon Vikas,
5. Peter Norton, Introduction to Computers,6e,(Indian Adapted Edition).

Additional References

- Greg Perry, SAMS Teach Yourself Open Office.org, SAMS,
- Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas
- George Beekman, Eugene Rathswohl, Computer Confluence, Pearson Education,
- Barbara Wilson, Information Technology: The Basics, Thomson Learning
- John Ray, 10 Minute Guide to Linux, PHI, ISBN 81-203-1549-9
- Ramesh Bangia, Learning Computer Fundamentals, Khanna Book Publishers

Model Question Paper

1A11BCA INFORMATICS FOR COMPUTER APPLICATION

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**

a. The fastest memory in a computer system is----------

b. ----------enables the processor to access data quickly whenever they are needed.

c. PDA stands for----------

d. An individual small dot, which one sees on the computer screen is called---------

e. A register that keep track of next instruction to be executed is called a ....

f. RAID stands for .....

g. The best suitable devices for bank cheques .....?

h. The semantic and syntax errors in a program are checked in:

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Convert binary 00011011 to decimal.
3. What is a system bus?
4. Define an algorithm.
5. Define operating system.
6. What are the new threats in the IT industry.
7. What is Unicode?
8. Explain ISDN.
9. What is a compiler?
10. Define data and information.
11. Define instruction cycle.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Discuss IPR
13. Draw a flow chart to find the largest of three numbers.
14 Write a note on Cyber Security.
15. Give the importance of IT in teaching and learning.
16. Explain about the input and output devices.
17. List and explain features of operating systems.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. a. Discuss internet as a knowledge repository
    b . Write notes on cyber crime.
19 What are the Internet access methods? Explain any four.
20 Write a note on program testing and debugging.
21 Explain about the generation and classification of computers.

1B01BCA
PROGRAMMING IN C

Hours per Week : Theory- 2 Practical- 2 **Credits : 2**

Objectives :

- *To learn basic concepts in programming.*
- *Develop skill in programming*
- *Familiarize the basic syntax and semantics of c language.*
- *To design algorithm for solving a programming problem.*
- *Familiarize with advanced features of c.*

Module I

Algorithms and Flow charts: Definitions, Symbols used, Program : structure, top-down design, source code, object code, executable file, file extensions. Importance of C; Basic structure of C, Programming style, executing a c program. Character set, C tokens, Keywords, identifiers, Constants, data types, declaration of variables, arithmetic operators , logical operators, Relational operators, Assignment operators, Increment and decrement operators, conditional operators, Bitwise operators. Precedence and order of evaluation. type conversion in expression. common programming errors, program testing and debugging, program efficiency.

Module II

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, go to statement. Looping statements- while, do...while, for loop. Break and continue statements.

Module III

Arrays: One dimensional arrays, two dimensional arrays, Initializing array elements, Multidimensional arrays. Strings: declaration and initializing, reading and writing. Arithmetic operations on character. String handling functions .Functions: Library and user defined, defining a function, calling a function. Parameter passing techniques, Scope and life time of variables in function, recursive functions, arrays and functions.

Module IV

Structure and union: definition, giving values to members, initialization. Array of structures, array with in structure, structure with in structure, union. Pointers: accessing the address of a variable, declaration and initializing pointers, accessing a variable through its pointers, pointer arithmetic, pointers and arrays (pointer to array and array of pointers) , pointers and character string , pointer and functions. Dynamic memory allocation: malloc(), calloc(), free(),realloc().

Module V

File Management: Text and binary files, Defining and opening a file, closing a file, input and output operations on file, error handling, random access file. Command line arguments.

Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

Reference books:

3. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
4. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1st edn, Pearson Education.
5. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,
6. Programming with C in Linux, NIIT, PHI.
7. C by Example, Noel Kalicharan, Cambridge University press.

Model Question Paper
1B01BCA PROGRAMMING IN C

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
2. Maximum number of elements in a [5] [13] is ……..
3. What will be the output of the following code:

```
void main(){ int x;
for(x=1;x<=5;x++);
printf("%d",x); }
```

c. …….. is a method for packing data of different types.

d. The strcmp() function compares two strings identified by the arguments and returns the value …….. if they are equal.

e main() is an example of …..function.

f. A variable which declared in static storage class has initial value……

g. C program uses a semicolon as a ……

h. The string related file supplied by C standard library is ….

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. List and explain logical operators in c.
3. What is t he value of Z if X=2; Y=X++; Z = ++X;
4. Write if statements required to find the minimum of three integers i, j and k.
5. Write necessary array declaration statements: list of 100 integers, a matrix of size 10x20 and a list of 100 names.
6. Differentiate between structure and union.
7. Explain the following : int *k = malloc (sizeof int);
8. Differentiate between text and binary files.
9. Explain the variable naming convention in C.
10. How will you read and write a character in C.
11. What are C Tokens.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Write algorithm to find the roots of a quadratic equation.
13. Write c program to read n positive integers and print number of odd and even numbers.
14. With suitable example(s), explain parameter passing techniques in c functions.
15. Explain how a one dimensional array can be accessed with pointers. With suitable example discuss pointer arithmetic.
16. With suitable examples, explain break and continue statements.
17. Write c program to read n positive integers and print number of odd and even numbers.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. With suitable examples explain the following:
    a. Switch statement.
    b. Recursive function.
    c. Conditional compilation.
19. Write a complete program to read two matrices and print their product. (Use function for various sub tasks|)
20. Explain about the looping statements in C.
21. Explain the different data types in C

SEMESTER II

2B02BCA
DIGITAL SYSTEMS

Hours per Week : Theory - 3 **Credits : 2**

Objectives:

- *Introduce the basic concepts in digital electronics.*
- *Appreciate significance of digitals systems in computer science.*
- *Familiarize with basic building blocks of digital systems.*
- *Design simple combinational digital systems.*
- *Familiarize different number systems and codes.*

Module I

Digital Principles: Definitions; digital Waveforms; digital Logic; Digital operations; Digital ICs and Signal Levels (Basic ideas only).Digital Logic: Basic Gates; Boolean algebra; NOR and NAND gates; AND-OR-INVERT gates; positive and Negative logic.

Module II

Combinational Logic Circuits: Boolean laws and Theorems; SOP methods; Truth table and K-map, K-map simplification (up to four variable);Data-processing circuits: Multiplexers; Demultiplexers; 1-of-16 decoder; BCD to decimal decoder; Seven-segment decoder; Encoders; Ex-Or gates; Parity generators and checkers; ROM .

Module III

Octal and Hexadecimal number system; CODES : ASCII, Excess-3, GRAY and UNICODE.Binary number representation and arithmetic; Arithmetic Building blocks; ADDER – SUBTRACTOR.

Module IV :

FLIP FLOPS : RS ; Gated FFs; Edge triggered RS, D and JK flip Flops; Flip flop Timings; JK Master Slave Flip flops.Registers : Types : Serial in – Serial Out; Serial In – parallel out; parallel In – Serial Out; Parallel In – parallel Out; ring Counters.

Module V :

Counters : Asynchronous counters ; Decoding gates; Synchronous counters; changing the counter Modulus; Decade counters; Presettable counters; Shift counters; A Mod-10 Shift Counter with encoding.

Text Books:

1. Digital Principles and Applications; Leach and Malvino; TMH; 6th edn

Reference

1. Digital Fundamentals, Floyd, 10th Edn, Prentice Hall.

Model Question Paper
2B02BCA DIGITAL SYSTEMS

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
   a. A quantity having continuous value is called…….
   b. 01100100 divided by 00011001 is……..
   c. In ……. Gate similar input produces a LOW
   d. When both inputs of a JK flip flops are high , the output will…….
   e. The modulus-10 Johnson counter is requires……..number of flip flops
   f. A+1=……..
   g. Which gate has Universal property ?
   h. A synchronous decade counter requires …… number of flip flops

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Write a short note on Digital data.
3. Convert the following to binary system

a. $(100100.01)_{10}$ b.$(0001011.101)_{10}$

4. Explain DeMorgan's theorem
5. Explain the universal property of NOR gate
6. Draw the circuit and truth table of an SR latch
7. State and prove any four rules of Boolean algebra.
8. What are edge-triggered flip flops?
9. Draw the logic circuit of gated D-latch.
10 Explain the Grey to binary code converter.
11. Write a short note on ripple counters.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. What is a full adder explain?
13 Apply Demorgans theorem and simplify the expression XY'Z'+X'Y'W+XZ'.
14 Compare multiplexers and demultiplexers.
15 Differentiate synchronous and asynchronous counters.
16 What are flip-flops? Explain its applications.
17 Explain up/down counter in detail

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Write a note on K map. Minimize the following expression
B'C'D'+A'BC'D'+ABC'D'+A'B'CD+AB'CD+A'B'CD'+ A'BC'D'+ABCD'+AB'CD'
19. What is a decoder. Explain the 7 segment display decoder.
20. Explain four-bit synchronous decade counter
21. What are shift registers? Draw and explain the diagram of serial in-parallel out shift register.

2B03BCA

OBJECT ORIENTED PROGRAMMING USING C++

Hours per Week : Theory - 2 **Credits : 3**

***Objectives**:*

- *.Introduce concepts such as classes and objects.*
- *Define and use classes and objects using C++ language.*
- *Introduce OOPs concepts such as inheritance and polymorphism and their implementation using C++.*

Module I :

Principles of object oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications.Introduction to C++, Structure of C++ program; Tokens, Keywords, identifiers and constants; Data types, symbolic constants; type compatibility; declaration and dynamic initialization of variables; reference variables. Operators, manipulators; type cast operators; Expressions, implicit conversions; operator overloading; operator precedence; Control structures.

Module II :

Functions; function overloading; friend and virtual functions; Math library functions. Structures; Specifying a class; Defining member functions; making an outside function inline; nesting of member functions; private member functions; arrays within a class; memory allocation for objects; static data members; static member functions; arrays of objects; objects as function arguments; friendly functions; returning objects; const member functions; pointer to members; Local classes.

Module III :

Constructors and destructors; dynamic initialization of objects; copy constructor; Dynamic constructors; const objects; Destructors. Operator overloading – definition; overloading unary operators; overloading binary operators; overloading binary operators using friends; manipulation of strings using operators; rules for overloading operators. Type conversions.

Module IV

Inheritance – defining derived classes; making a private member inheritance; Types of inheritance; virtual base classes; abstract classes; constructors in derived classes; Nesting of classes. Pointers; Pointers to objects; Pointers to derived classes; virtual functions; pure virtual functions.

Module V :

C++ streams; stream classes; unformatted I/O operations; Formatted console I/O operations; Managing output with manipulators.iles – classes for file stream operations; Opening and closing a file; file modes; file pointers and their manipulations; Sequential input and output operation.

Text book:

1. Object Oriented Programming with C++; E. Balagurusamy; 3rd Edn; TMH 2006

Reference Books: .

1. Programming in C++, M.T. Somashekara, Prentice Hall of India, New Delhi
2. Object Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, Pearson Education
3. Let us C++, Yeshwanth Kanethkar, BPB

Model Question Paper
2B03BCA OBJECT ORIENTED PROGRAMMING USING C++

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1.**One word answer** **(8 x 0.5 = 4 marks)**

a) Instance of a class is called _____
b) _____ is memory dereferencing operator.
c) The default access level assigned to members of a class is _____
d) Default value of a static variable is _____
e) Every class has …….constructor function, even when none is declared.
f) Abstract class has _____ number of objects.
g) In operator overloading unary operator has_____ number of arguments.
h) Mechanism of deriving a class from another derived class is known as____

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Explain reference variable with suitable example.
3. Explain scope resolution operator.
4. Write a note on inline function.
5. Write a note on array of objects.
6. What is a destructor?
7. What are the rules for operator overloading?
8. Explain abstract base class.
9. Write a note on nesting of classes.
10. What is the use of fstream class?
11. Describe various file mode options

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Explain the difference between while and do-while loops.
13. Discuss function overloading with suitable examples.
14. Explain copy constructors with suitable example.
15. Explain about virtual base class.
16. Write a C++ program to write and read integers from a file.
17. Write a C++ program to add two complex numbers using operator overloading

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Explain the basic concepts of Object Oriented Programming.
19. Explain the following :
    a). Friend Function
    b). Static member functions.
20. Write a note on Operator Overloading.
21. Explain Inheritance and its types with suitable example.

2B04BCA LAB – I
PROGRAMMING IN C

Credits : 2

***Objectives**:*

- *Skill in Programming using c language.*
- *Expertise in c program development steps: edit, compile, debug, execute and test under Windows as well as Linux platforms.*

Sample Program List

Students have to practice all programs and record a minimum of 15 programs. They have to be familiar both in windows and Linux platforms.

Part A (Minimum 10 programs)

1 Write a program to print the size of all the data types in C and its range.
2 Write a program to convert Fahrenheit to Celsius.
3 Write a program to check whether the given number is a Prime number or not.
4 Write a program to accept three numbers and find the largest and second largest
5 Write a program to print all prime numbers between any 2 given limits.
6 Write a program to print all the Armstrong numbers between any 2 given limits.
7 Write a program to check whether the string is a Palindrome.
8 Write a program to check whether a given matrix is an Identity matrix or not.
9 Write a program to perform matrix multiplication.
10 Write a program to count the different vowels in a line of text.
11 Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.
12 Write a program to find the roots of a quadratic equation
13 Write a recursive program to find the factorial of a number.
14 Create an employee structure and display the same.
15 Write a function to swap two numbers using pointers
16 Write a program to access an array of integers using pointers
17 Create a file and store some records in it. Display the contents of the same.
18 Implement search, modify, and delete operations.
19 Perform the different bitwise operations (menu driven program) .The i/p and the o/p should be displayed in Binary form.
20 Write a program to check whether a given number is odd or even using bitwise operators.

2B05BCA LAB – II
PROGRAMMING IN C++

Hours per Week: Practical - 2 **Credits : 2**

Sample Programs List

Students have to practice all programs and record a minimum 15 programs. All programs must be based on OOP concepts.

1. Program to find the factorial of a number using recursion.
2. Program to find whether the given number belongs to fibonacci series.
3. Program to find whether the string is palindrome or not. Use pointers.
4. Write a program to sort n numbers.
5. Program to find biggest, smallest, sum and difference of two numbers using inline function.
6. Program to find the area and volume of respective figures using function overloading.
7. Program to add one day to a given date.
8. Program to add and subtract two matrices.
9. Program to multiply two matrices.
10. Program to find the trace and transpose of a matrix.
11. Program to show stack operations.
12. Create a class time comprises hr,min and sec.as member data and add() and display() as member functions. Use constructor to initialise the object. write a main function to add two time objects, store it in another time object and display the resultant time
13. Program to negate the elements of an array. Use operator overloading function with the operator -.
14. Program to compare two strings. Use operator overloading (==). Do not use any built in functions.
15. Define a class student with name, reg.no, date of birth and name of college as member data and functions to get and display these details. Design another class Test with subjects of study and grade for each subject as member data and corresponding input and output functions. Derive a class Result from both Student and Test classes and Print the Result of each student with relevant information.
16. Start with an array of pointers to strings representing the days of the week. Provide functions to sort the strings into alphabetical order. Use pointers
17. Create a class person with personal details. Define two functions, set details and printdetails. Declare array of pointers to person class and write a main function to set and print the details of n persons using pointers.
18. Design two classes A and B with member data n1 and n2 respectively. Set values for each one. Write a program to interchange the values of both A and B. Use friend function.

19. Design a class SHAPE with dimensions d1 and d2 as member data and area() as member functions to find the area of a shape. Derive three classes RECT,TRIANG and CIRCL from the class SHAPE and override the function area() of base class to find the area of individual shape.Use virtual function.

20. Write a program to show returning current object, accessing member data of current object and returning values of object using this pointer.

21. Design a class employee with relevant emp details. Read the details of n emp from the keyboard and write it into a File named empdetails. At the end of writing every n emp details read them back from the same file and display into the screen. Use seperate functions to write and read into and out of the file.

22. Addition / Subtraction / Multiplication of complex numbers using classes.

23. Define a class to represent a bank account. Include the following members :

    Data Members:

    1. Name of the depositor.
    2. Account number.
    3. Type of account.
    4. Balance amount in the account.

    Member Functions

    1. To assign initial values.
    2. To deposit an amount.
    3. To withdraw an amount after checking the balance.
    4. To display name and balance.

    Use appropriate main program.

24. Assume that a bank maintain two types of accounts for customers, one called as saving account and the other as current account. The saving account provides compound interest and withdrawal facilities, but no check book facility. The current account provides check book facility but no interest. Current account holders should maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class ACCOUNT that stores customer name, account number and type of account. From this derive the classes CURR_ACCT and SAVE_ACCT to make them more specific to their requirements. Include necessary member functions inorder to achieve the following tasks :

    1. Accept deposit from a customer and update the balance.
    2. Display the balance.
    3. Compute and deposit interest.
    4. Permit withdrawal and update balance.
    5. Check for the minimum balance, impose penalty if necessary and update the balance.

    Note : Do not use constructors. Use member functions to initialize the class members.

25 Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called TRIANGLE and RECTANGLE from the base SHAPE. Add to the base class, a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine this function in the derived class to suite the requirements.

SEMESTER III

3A12BCA
DATA STRUCTURE

Hours per Week : Theory - 4 Practical - 3 **Credits : 4**

Objectives:

- *To familiarize students with concept of data structures and its relevance in computer science.*
- *To introduce the concept of analysis of algorithms and ability ro compare algorithms based on time and space complexity.*
- *To familiarize with selected linear and nonlinear data structures.*
- *To enhance skill in programming.*

Language for Implementation: C++

Module I

Data structures: Definition and Classification. Analysis of Algorithms : Apriori Analysis; Asymptotic notation; Time complexity using O notation; Average, Best and Worst complexities. Arrays :- Operations; Number of elements; Array representation in memory.Polynomial- Representation with arrays; Polynomial addition.Sparse Polynomial:- representation.Sparse matrix: Efficient representation with arrays; Addition of sparse matrices. Recursive algorithms: examples – factorial and Tower of Hanoi problem.

Module II

Search : Linear and Binary search; Time complexity; comparison.Sort : Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms.

Module III

Stack: Operations on stack; array representation. Application of stack- i. Postfix expression evaluation. ii. Conversion of infix to postfix expression. Queues: Operation on queue. Array Implementation; Limitations; Circular queue; Dequeue, and priority queue. Application of queue: Job scheduling.

Module IV

Linked list – Comparison with arrays; representation of linked list in memory. Singly linked list- structure and implementation; Operations – traversing/printing; Add new node; Delete node; Reverse a list; Search and merge two singly linked lists.Stack with singly linked list.Circular linked list – advantage. Queue as Circular linked list. Head nodes in Linked list – Singly linked list with head node – Add / delete nodes; Traversal / print.Doubly linked list – structure; Operations – Add/delete nodes ; Print/traverse. Advantages.

Module V

Tree and Binary tree: Basic terminologies and properties; Linked representation of Binary tree; Complete and full binary trees; Binary tree representation with array. Tree traversal : Recursive inorder, preorder and postorder traversals. Binary search tree - Definition and operations (Create a BST, Search, Time complexity of search). Application of binary tree: Huffman algorithm.

Text Book :

1. Data Structures and Algorithms: Concepts, Techniques and Applications; GAV Pai, Mc Graw Hill, 2008

Reference Books :

2. Data Structures in C, Achuthsankar and Mahalekshmi, PHI, 2008
3. Fundamentals of Data structures in C++ , 2nd Edn, Horowitz Sahni, Anderson, Universities Press
4. Classic Data structures, Samanta, Second Edition, PHI

Model Question Paper

3A12BCA DATA STRUCTURE

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**

2.

a . A 2-D array is also called ……

b A data structure is said to be ……..if its elements form a sequence.

c. A ……..is nothing but an array of characters.

d An array of pointers to strings stores ……..of the strings

e The '\O' character indicates…….

f. A matrix is called sparse when……..

g O notation stands for …..

h Basic operations in linked list are …….

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

3. What is Apriori Analysis
4. How to delete an element from the linked list
5. Define data structure
6. What is a sparse matrix?
7. What is garbage collection?
8. What is compaction?
9. What is the use of stack in real life?
10. Define dynamic data structure
11. What is multi stacks?
12. What is the complexity of algorithms?

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

13. Transform following prefix expression into infix a) +A-BC b)+-$ABC*D**EFG
14. Explain binary search in detail.
15. Explain advantageous of circular linked list.
16. Write program to which count number of words in a given text.
17. How to delete elements from a double link list
18. What is a sparse matrix explain

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

19. Write a program that would accept an expression in infix form and convert it to a prefix form
20. What are the different operations on linked list? Explain
21. What are the advantages of binary tree search?
22. Compare different sorting algorithms

3A13BCA

DATABASE MANAGEMENT SYSTEM

Hours per Week: Theory - 4 Practical - 2 Credit: 4

Objectives:

- *Introduce the basic concepts in DBMS.*
- *Skill in designing database.*
- *Familiarization of different DBMS models.*
- *Skill in writing queries using MySQL.*

Module I

ntroduction – purpose of Database systems. View of Data, data Models, transaction management, database structure, DBA, Data Base Users.

Module II

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features.Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

Module III

SQL : database languages; DDL; create, alter, Drop, DML, Insert into, Select, update, Delete,. DCL commands, Data types in SQL; Creation of database and user.Case study : MySQL.

Module IV

Developing queries and subqueries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences.Case study : MySQL

Module V

Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domain calculus.

Text books:

1. Database system concepts; Silberschatz, Korth and Sudarsan, 5th Edn; McGraw Hill.
2. The database book : Principles and Practice Using MySQL; Gehani; University Press.

Reference:

1. Fundamentals of Database systems, E. Navathe, 4th edn, Pearson Education.

Model Question Paper
3A13BCA – DATABASE MANAGEMENT SYSTEM

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**

a) The collection of information stored in the database is called…….?
b) The data hold across the primary key column must be_____
c) Primary goal of data base is?
d) _____ Keys represent relationships between tables
e) The structure of database is……..?
f) ……is the association among several entities?
g) For each attribute there is a set of permitted values is called _____
h) Example of derived attribute

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. What is the usage of CREATE command?
3. Write a note on E-R Model?
4. Explain about INSERT command?
5. Write a note on nave users and application programmers?
6. Which are the different types of attributes?
7. Explain UPDATE command.
8. Define foreign key.
9. Define functional dependency.
10. Write the syntax of Alter query and explain.
11. What is Projection operation in relational algebra.

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. Explain transaction management?
13. Explain the advantages of DBMS?
14. Which are the different types of keys?
15. Explain components of SQL?
16. Write a note on ALTER command?
17. Which are the different data types used in SQL

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. What do you mean by Database administrator? Explain functions of DBA?
19. Explain relational algebra?
20. Explain ER data Model.
21. Write a detailed note on normalization

3B06BCA
COMPUTER ORGANIZATION

Hours per Week : Theory - 4 **Credit: 3**

Objectives

- *To introduce the basic terminology of computer hardware.*
- *To familiarize the functional units of a computer system.*
- *To understand the basic operation of a computer system.*
- *To understand the memory organization in a computer system*

Module I

Basic structure of computer-Types of computers-Functional Units-Basic operational Concepts-Bus structure-Multiprocessors and Multi computers-Data representation-Fixed Point representation and floating Point representation.

Module II

Register Transfer and Micro operations – Register Transfer language-Register Transfer-Bus and memory Transfer-Three state bus buffers-Memory Transfer-Basic Computer Organization and Design – Instruction Codes – Fetch & Decode Instructions – Register Reference Instructions – Memory Reference Instruction – Input output & Interrupt.

Module III

Micro Programmed Control – Control Memory – Address sequencing – Central Processing Unit – General Register Organization – Control word – Stack Organization – Register stack - Memory Stack – Reverse Polish notation – Evolution of Arithmetic expressions – Instruction Formats – Addressing modes – Data Transfer and Manipulations – reduced Instruction set computer(RISC)

Module IV

Input Output Organization – Peripheral Devices – Input/Output Interfaces – Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications.

Module V

Memory Organization – Hierarchy – Main memory – Auxiliary Memory – Associative Memory – Cache memory – Mapping – Multiprocessors – Characteristics of multiprocessors - Inter connection structures – Inter Processor Arbitration.

Text Books

1. Computer system Architecture –M.Morris Mano - PHI Pvt Limited
2. Computer Organization - Carl Hamacher –International Edition

References

1. Computer Organization and Architecture , William Stallings, 7th Edn, Pearson Education.
2. Computer Architecture & Organization John P Hayes –Mc Graw Hill

Model Question Paper
3B06BCA COMPUTER ORGANIZATION

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
   a) The type of the addressing mode in which the effective address is equal to the address part of the instruction is ……..
   b) The register that hold the address of the stack is……..
   c) The data register is some times called……..
   d) The transfer of information from a memory word to outside environment is ……
   e) The third state of three state bus buffer is ……
   f) Which condition can be detected by observing the carry into the sign bit position and the carry out sign bit position……..
   g) If the most significance digit of mantissa of floating point number is non zero then the number is said to be …….
   h) The register that keeps track of address of the instruction is to be executed is called ……

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Explain the relative address mode
3. What are the difference between the multiprocessors and multi computers?
4. Explain floating point representatives.
5. What is a register transfer?
6. What is an effective address?
7. Write three memory references instructions.
8. What is an interrupt cycle?
9. What are the major phases an instruction cycle?
10. What is RISC?
11. Explain base register address Mode.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Explain base register address mode
13. Explain different Auxiliary Memory types
14. Explain 2's complement addition and 2's complement subtraction.
15. Explain address sequencing
16. What is the general register organization?
17. Explain the register indirect mode.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Explain the fixed point and floating point representation
19. Explain the direct memory access in detail.
20. Explain different addressing modes.
21. Write a detailed note on instruction cycle describing the various steps involved.

3B07BCA
INTRODUCTION TO MICROPROCESSORS

Hours per Week : Theory - 4 **Credit: 3**

Objectives *:*

- *Familiarize with 8085 architecture.*
- *Familiarize with 8086 architecture.*
- *Skill in writing assembly language programs.*
- *Understand Interrupts and DMA techniques*.

Module I

Introduction: History of Microprocessors, Introduction to 8-bit microprocessor - 8085, Architecture of 8085, Bus organization of 8085, Internal Data Operations and 8085 registers.

Module II

Introduction to 16-bit microprocessor – 8086, Architecture of 8086, Functional Block Diagram, Register Organization of 8086, Signal Description of 8086, Physical Memory Organization, Memory Mapped and I/O Mapped Organization, General Bus Operation, I/O Addressing Capability, Minimum and Maximum Mode 8086 System and Timings.

Module III

Addressing Modes of 8086, Machine Language Instruction Format, Assembly Language Programming of 8086, Instruction Set of 8086-Data transfer instructions, Arithmetic and Logic instructions, Branch instructions, Loop instructions, Processor Control instructions, Flag Manipulation instructions, Shift and Rotate instructions, String instructions, Assembler Directives and operators.

Module IV

Introduction to Stack, STACK Structure of 8086, Interrupts and Interrupt Service Routines, Interrupt Cycle of 8086, Non-Maskable and Maskable Interrupts.

Module V

Data transfer schemes – Programmed IO, Interrupt driven IO and DMA. Programmable Peripheral Interface 8255, DMA Controller 8257, Programmable Interrupt Controller 8259A

Text Book

Advanced Microprocessors and Peripherals – Architecture, Programming and Interfacing by A.K. Ray and K.M. Bhurchand, Tata McGraw Hill,2002 Edition

Reference Books

1. Microprocessors and Interfacing – Programming and Hardware by Douglas V Hall, 2nd Edition, Tata McGraw Hill, 2002.

Model Question Paper
3B07BCA INTRODUCTION TO MICROPROCESSORS

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a) The 8086 microprocessors has _____ clock rates.
b) Data Segment register is used to store _____
c) _____ instruction effects only carry flag.
d) The _____ directive is used to reserve bytes of memory locations in available memory.
e) The _____ has the highest priority among external interfupts.
f) Division by zero generates _____ interrupt.
g) The normal time taken by memory read cycle is _____
h) 8085 has _____ general purpose registers.

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. How DMA is initiated?
3. What is indexed addressing?
4. Compare macro and subroutines.
5. What is an externel interrupt?
6. What is an assembler directive?
7. What is a register addressing mode?
8. What is the difference between CALL and INT instruction.
9. List the features of 8259.
10. What is the use of ALE signal?
11. What is the difference between segment register and general purpose registers.

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. How interrupts are handled by 8086.
13. Explain handshaking in 8222
14. What are asynchronous counters.
16. Compare maskable and nonmaskable interrupts
17. Explain the architecture of an 8086 microprocessor.

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. Discuss addressing modes in 8086.
19. Describe the register organization of 8086
20. Explain the memory organization, memory mapping and memory related data transfer in 8086.
21. List and explain the different types of interrupts in 8086. Explain instructions related to interrupt subroutines.

SEMESTER IV

4A14BCA

NUMERICAL ANALYSIS

Hours per Week: Theory - 4 **Credits: 4**

Objectives:

- *To expose students to computer-based numerical solutions.*
- *To impart basic theoretical knowledge underpinning numerical solutions to the following problems and also to provide an opportunity to apply programming skills*

Module I

Introduction to Numerical Methods: Nature of numerical problems; computer based solutions; number representations; Notions of accuracy, convergence, efficiency, complexity-Floating point representation- Error- Significant Digits- Numerical Instability- Solutions of Non-linear equations: Bisection method; Regula-Falsi; Newton-Raphson.

Module II

System of Linear Equations- Gauss elimination, Gauss Jordan elimination, Triangulation method, Iterative method, Jacobi.

Module III

Numerical Integration & Differentiation: Concept of differentiation and Integration, graphical interpretation; Cubic Spline based Numerical Differentiation; Numerical Integration: Taylors series and Eulers methods- Simpson's Romberg, Gaussian, Runge Kutta methods.

Module IV

Mathematical Logic- Statement calculus- Connectives- Normal Forms- Theory of inference for the statement of Calculus.

Module V

Graph Theory- Basic concepts- Storage representation and manipulation of graphs.

Text Books

1. V. Rajaraman, Computer Oriented Numerical Methods, 3/e, PHI
2. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill, New Delhi, 1999.
3. Discrete Mathematical Structures with Application to Computer Science- McGraw Hill

References

1. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
2. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.
3. N Datta, Computer Oriented Numerical Methods, Vikas

Model Question Paper
4A14BCA NUMERICAL ANALYSIS

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**

   a) Inverse of a matrix is defined by A^{-1} = _____

   b) The errors introduced during the implementation of a numerical method are known as ……?

   c) The decimal representation of the binary number is 87.450 is_____

   d) The number of edges appearing in the sequence of a path in digraph is called…..

   e) _____An edge of a graph which joins a node to itself is called a ……

   f) Machine dependent error is called _____

   g) The method of obtaining the derivative of a function using a numerical technique is known as _____

   h) The iterative method which has the fastest convergence is _____

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Find the position of the smallest positive root of 2x^2-9x+9=0.
3. Solve x=2y=3 , 3x-2y=1 by Gauss elimination method
4. Find y(0,10 by taylor series method given y'=y=x,y(0) =1 (Take h=0.1)
5. Define a simple graph. Give an example
6. Define the concept of isomorphism in graphs. Give examples of 2 isomorphic graphs
7. Explain regula- falsi method.
8. Evaluate by Simpsons 1/3 rule taking h 0.25
9. Prove that simple digraph every node of the digraph lies in exactly one strong component.
10. Explain Lagrange's interpolation method.
11. Find inverse of A by Gauss_Jordan Method

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Evaluate the approximate value of of Newton Raphson method?
13. Explain disjunctive and conjunctive normal forms.
14. Given with y=1 for x=0 find y approximately for x=0.1 by Eulers method.
15. Calculate by Trapezodial rule an approximate value of .
16. Find a real root of the equation using bisection method .
17. Write algorithm for Newton Raphson 1/3rd method.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Use Runge Kutta method with h=0.1 to find y(0.2) given with y(0)=0
19. Explain any one iteration method for solving linear equations.
20. Use Gauss Jordan method solve the system of equation 2x-3y+4z=7, 5x-2y+2z=7 6x-3y+10z=23.
21. Find Lagrange's interpolation polynomial fitting the points f(1)=-3,f(3)=0, f(4)=30,f(6)=132 hence find f(5).

4B08BCA

OPERATING SYSTEM

Hours per Week : Theory - 4 **Credit: 3**

***Objectives**:*

- *Introduce basic concepts of operating systems.*
- *Familiarize with features of operating systems.*
- *To expose the basics of design of operating systems.*
- *To get an overview of Linux.*

Module I

Concepts – Importance – Resource manager – Views – Design considerations – I/O programming – Interrupt structure and processing. (Text Book 1) Batch Processing System – Multi programming system - Time Sharing System – Real Time System. (Text book 2)

Module II

Processor management: Process – interacting processes - Threads – Scheduling policies – job scheduling – process scheduling – Multi processor OS. Dead locks – Dead lock handling techniques. (Text book 2)

Module III

Memory management: Single contiguous allocation – Partitioned allocation – Relocatable partitioned – Paging – Demand paging – Segmentation – Segmentation and demand paging – Other schemes (Text book 1)

Module IV

Device management: Techniques – Channels and control units – I/O traffic controller, I/O scheduler, I/O device handlers – Virtual devices.Information management: Introduction – General model - SFS – BFS – ACV – LFS – PFS – ASM . (Text book 1)

Module V

Unix and Linux – History; over view; Process, memory management – I/O – file system – security. (Text Book 3)

Text Book

1. Stuart E Madnick and John J Donovan, “Operating Systems”, Tata McGraw-Hill, 2005
2. Dhamdhere, “Systems Programming and Operating Systems”, 2nd Revised Edn, TMH
3. A. S. Tanenbaum, “Modern Operating systems”; PHI

Model Question Paper

4B08BCA OPERATING SYSTEM

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a. **……** is the execution of a series of jobs on a computer without manual intervention.
b. PCB stands for _____
c. Degree of multi programming is controlled by _____ scheduler.
d. Bankers algorithm is used for _____
e. Deadlocks can be described in terms of a direct graph called _____
f. TLB stands for _____
g. _____ is the memory management scheme that support user view of memory.
h. _____ is the interface between user and the operating system.

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. Explain time sharing operating system
3. Write a note on command interpreter.
4. What is a process?
5. Write not on context switch.
6. Define deadlock.
7. Explain safe state.
8. What is swapping.
9. What is page fault.
10. Write a note on C shell.
11. What are the use of following commands : mv, rm

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. Write a note on Operating system components.
13. Write about various process state.
14. Write a note on thread.
15. What are the necessary condition for dead lock.
16. Explain about demand paging.
17. Write a detailed note on various types of shells.

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. Discuss in detail about scheduling algorithms.
19. Explain methods for handling dead lock.
20. Explain any four memory management schemes.
21. Explain I/O management schemes.

4B09BCA
JAVA PROGRAMMING

Hours per Week : Theory - 4 **Credit: 3**

Objectives:

- *To review Object Oriented Programming concepts.*
- *Learn features of Java programming*
- *To develop s kill in java programming*.

Module I

Introduction to Java programming : Java technology; history; java as a new paradigm; features of java; Applications and applets (Simple examples); Java Development Kit Java Language fundamentals : Building blocks; Data types; variable declarations; wrapper classes; Operators and assignment; control structures; arrays; strings; String buffer classes.

Module II

Java as an OOP Language: Defining classes; Modifiers; Packages; Interfaces.

Module III

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); Exception and inheritance; Throwing user defined exceptions; Advantages of exception handling.Multithreading: Overview; Creating threads; thread life cycle; Priorities and scheduling; synchronization; Thread groups; communication of threads; Sample programs.

Module IV

Files and I/O streams: Overview; Java I/O; file streams; FileInputStram and FileOutputStream; Filter Streams; RandomAccessFile; Serialization.Applets : Introduction; Application vs. applets; Applet lifecycle; Working with Applets; The HTML APPLET tag; the java.Applet Package; Sample programs.

Module V

The Abstract Window Toolkit:- Basic classes in AWT; Drawing with Graphics class; Class hierarchy; Event handling; AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars); Layout Managers. The menu component hierarchy; Creating menus ; Handling events from menu items ; Enabling keyboard operation ; Bringing up a popup menu ; Customizing menu layout; The Menu API

Text book :

1. Object Oriented Programming through JAVA, Radha Krishna, University Press.

Reference:

1. Programming with java: A primer, 3rd Edn; E. Balaguruswami; McGraw Hill
2. Java 2 The complete Reference, Schildt, McGraw Hill

Model Question Paper
4B09BCA JAVA PROGRAMMING

Time: 3 Hrs **Max. Marks: 40**

Section A

1. **One word Answer** **(8 x 0.5 = 4 marks)**

a) The output of Java compiler is _____

b) The width in bite of short data type is_____

c) A variable can be declared as constant in java using____keyword.

d) The variable declared as protected have access by subclass of different packages. Say true or false.

e) All exceptions are subclasses of built in class ____

f) You can create thread in Java by implementing _____ interface.

g) _____ is the default layout manager.

h) _____ is the method used to get number of items in a choice control.

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. How to create and use an one dimensional array in Java?
3. Define an applet.
4. Explain how to declare an object and define a class.
5. Syntax of try ____ catch statement with multiple catch.
6. Short note on thread groups.
7. Explain APPLET tag.
8. Write about any two methods of button class.
9. Short note on DatabaseMetaData object.
10. Short note on StringBuffer class
11. Explain any two string operations in Java

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Write a Java program to illustrate single level inheritance.
13. Short note on Thread Priorities in Java.
14. Write an overview of filter streams in Java.
15. What do you mean by event listeners in Java?
16. What are the advantages of inheritance in programming?
17. Explain exception handling in Java.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Write a program to matrix multiplication.
19. Explain how to create and use statement object in Java.
20. What is the purpose of throw statement in java?
21. Write a Java program to create a thread by extending thread class.

4B10BCA
LINUX ADMINISTRATION

Hours per Week : Theory - 4 **Credit: 3**

Objectives

- *Introduce Linux working environment*
- *Understand how to install and configure Linux*
- *Learn how to write shell scripts*

Module I

Features and benefits of Linux- basic concepts of multi user system-open source, freedom-Linux-components of Linux, types of users in Linux, types of files.Introduction-login, password, creating an account, shell and commands, logout,changing password-files and directories-pathname-directory tree-currend working directory-referring home directory-cbeating new directories,copying files,moving files,deleting files and directories-types of shell-wild cards-hidden files- looking at files: cat, more-online help:man.

Module II

Vi editor-different modes-command mode, insert mode, last line mode- redirecting input/output-filter, pipes, file permissions, user, group, changing file permissions - mounting floppy,HDD, CDROM-file systems-structure of /etc/fstab- Bourne shell scripts: script execution-variables and parameters, if, for, case, while constructs.

Module III

Linux Administration: Introduction-various parts of the OS-kernel, system program, application program, system calls-important parts of the kernel. Boot procesS: booting-LILO boot process,/edc/lilo.conf, GRUB, /etc/grub.conf-runlevels-GUI,X windows- rc files, startup scripts.

Module IV

Major services in linux system : init,/etc/inittab file -login from terminal3, syslog-periodic command execution: at and cron, crontab fileSystem configuration files:/etc/sysconfig/.....files,keyboard,mouse etc. System security: password,/etc/passwd file-shadow password,/etc/shadow-file permissions, chmod and umask-adding and deleting users-host security, tcp wrappers,/etc/host.allow, /etc/host.deny.

Module V

System Maintance: tmpwatch-logrotate-basic system backup and restore operation-Basic shell configuration for bourne and bash shell : /etc/profile,~/.bashrc,~/.bash_profile.Linux Installalation : Partitioning, MBR, SWAP, filesystem managing-different packages, rpm-installation of packages-starting and stopping different services.

Text book

1. Unix Shell Programming, Yeshwanth kanethkar

Reference:

1 Unix in a nut shell,by Daniel Gilly, O'Reilly & Associates
2 Linux Administration handbook, Nemeth, PHI

3 Essential System Administration, O'reilly & Associates.
4 Red Hat linux Bible
5 A user guide to the unix system, Thomas,Yates Tata McGraw Hill

Model Question Paper
4B10BCA LINUX ADMINISTRATION

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. **One Word Answer** **8 x 0 .5=4 marks**

a) The command used to rename a file in Linux is _____
b) What is the PID of the Kernel process?
c) The default run level with GUI in Linux is_____
d) _____ process is termed as the parent of all process in Linux
e) GRUB stands for_____.
f) Name the directory that storer system configuration files in Linux
g) The GUI of Linux is termed as_____.
h) _____command is used to switch one runlvel to another

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. What are the procedure for adding new users in Linux
3. Write a note on X window system
4. How shadow password provides additional security ti Linux users?
5. What are the contents of /etc/grub.conf file?
6. Explain the output of ls –l command.
7. How to schedule a job using cron.
8. Explain system log messages
9. How to compres a file in IInux?
10. How to manage process in Linux using ps command?
11. Write a note on shell configuration files

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Write a shell program to find whether a number is odd or even
13. What are runlevels?. Explain briefly
14. What are the seven types of files supported by Linux OS.
15. How the host based security is achieved in Linux
16. Write a note on kernel module management
17. How to mount and unmount file systems in Linux

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. What are the features of Linux Operating system
19. Explain briefly how the back up and restore operations can be done in Linux.
20. What are the basic permissions available to files in Linux? How to set that using Linux? How we can change that permissions?
21. Explain briefly the steps in installing Linux OS

4B11BCA Lab–III
Data Structure & DBMS

Credit: 3

The lab consist of two sections, Section A : Data structures and Section B : DBMS. Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall be obtained by combining them. End semester examination question shall carry questions from both sections.

Section A : Data Structures

A list of twenty programs is given below. Each student has to complete and record a minimum of 15 exercises. A detailed problem statement shall be prepared by the faculty concerned.

1. Recursion -Tower of Hanoi problem.
2. Delete and insert elements from an array.
3. Add two polynomials.
4. Add two sparse matrices.
5. Sequential and binary search : Print number of comparison in each case for given datasets.
6. Insertion sort.
7. Bubble and selection sort : Print number of comparisons and exchanges in each case for given data sets.
8. Quick sort.
9. Merge sort.
10. Conversion of infix expression to postfix.
11. Evaluation of postfix.
12. Menu driven program : to add / delete elements to a circular queue. Include necessary error messages.
13. Singly linked list operations : add a new node at the beginning, at the end, after i^{th} node, delete from beginning, end, print the list.
14. Singly linked list operations: Search list, merge two list and count number of nodes.
15. Circular linked list : add a new node at the beginning, at the end, after i^{th} node, delete from beginning, end, print the list.
16. Doubly linked list : add a new node at the beginning, at the end, after i^{th} node, delete from beginning, end, print the list.
17. Use a linked stack to reverse a string.
18. Implement tree traversal.
19. Create a binary search tree out of given data and traverse it inorder.
20. Merge two sorted linked list.

Section B: DBMS

Minimum 10 exercises covering SQL related topics . Sample exercises are given below:

SQL -1

- Create a sequence named 'star' to be used with student tables primary key coloumn-sn0. The sequence should start with 10 & max value 99
- Create table students with fields sno, sname, sex, mark with sno as primary key and assign suitable constraints for each attribute.
- Insert five records into the table.

1. Alter the table by adding one more field rank.
2. Display all boy students with their name.
3. Find the Average mark
4. Create a query to display the sno and sname for all students who got More than the average mark. Sorts the results in descending order of mark.
5. Display girl student name for those who have marks greater than 40 and less than 20.

SQL -2

- Create a table department with fields ename, salary, dno, dname, place with dno as primary key.
- Insert five records into the table.

1. Rename the field 'place' with 'city'
2. Display the employees who got salary more than Rs.6000 and less than10000 /-
3. Display total salary of the organization
4. Display ename for those who are getting salary in between 5000 and 10000.
5. Create a view named 'Star' with field ename, salary & place
6. display ename and salary, salary rounded with 10 digits'*'

SQL -3

- Create a table department with fields dno, dname, dmanager and place with dno as primary key.
- Create a table emp with fields eno, ename, job, dno, salary, with eno as primary key. Set dno as foreign key.
- Insert five records into each table.

1. Display the ename and salary, salary with ascending order
2. Display ename and salary for eno=20,
3. Display the manager for the accounting Department
4. Display the name,salary and manager of all employees who are getting salary > 5000
5. Write the queries using various group functions.
6. Write the queries using various Number functions.

SQL -4

- Create a sequence to be used with the Emp Table's primary key column. The Sequence should start at 60 and have a maximum value of 200. Have your sequence increment by 10 numbers.

- Create a table emp with fields eno ,ename, job, manager, salary, with eno as primary key.

- Insert values into the table.

1. Display ename, salary from emp who are getting salary more than average salary of the organization.
2. ADD 20% DA as extra salary to all employees. Label the coloumn as 'New Salary'
3. Create a query to display the eno and ename for all employees who earn more than the average salary. Sort the results in descending order of salary.
4. Create a view called emp_view based on the eno, ename from emp table change the heading for the ename to 'EMPLOY'.
5. Write a query that will display the eno and ename for all employees whose name contains a 'T'.
6. Write a script to display the following information about your sequences. Sequence name, maximum value, increment size and last number.

SQL -5

- Create a table department with fields dno, ename,salary, Designation,dname,place with dno as primary key.

- Insert values into the table.

1. Write the queries using various Character functions in ename field.
2. Create a query to display the employee number and name for all employees who earn more than the average salary. Sort the results in descending order of salary.
3. Display all employees who got salry between 5000 &10000
4. Display ename, salary, Designation for those who got salary more than 5000 or his Designation is 'clerk'.
5. Display Ename and designation those who are not a clerk or manager.
6. Display the names of all employees where the third letter of their name is an 'A'

SQL -6

- Create a table Customer with fields cid, cname, date_of_birth,place

- Create table loan with fields loanno,cid,bname assigning suitable constraints.

- Create table depositor with fields accno, cid, balance, bname assigning suitable constraints.

- Insert 5 Records in to each table.

1. Add one more field amount to loan table. Update each record. Display cname for cid=2.
2. Calculate Rs 150 extra for all customers having loan.The added loan amount will display in a new coloumn.
3. Display loanno, cname and place of a customer who is residing in Kannur city.
4. Display all information from loan table for loanno 2,8,10.
5. Display all customers who have both loan and deposit.

4B12BCA LAB – IV

JAVA PROGRAMMING, SHELL PROGRAMMING AND LINUX ADMINISTRATION

Hours per Week: Practical - 5 **Credits: 3**

The lab consist of two sections, Section A : Java Programming B : Linux Administration. Equal weightage will be given for both section. For internal assessment, each part may be evaluated independently and final CA grade shall be obtained by combining them. End semester examination question shall carry questions from both sections.

- Practice **all** the programs in the lab
- Include all programs from part A and minimum 10 from part B in practical record.

Section A : Java Programming

1. Write a java program to perform various string operations using java class.
2. Write java program to implement interface.
3. Write java program that handles various exceptions. Use try –catch statement.
4. Write java program to implement file I/O operation using java iostreams.
5. Write java program to implement Applet life cycle.
6. Write java program to implement a calculator using suitable AWT controls.
7. Write java program to implement menus and popup menus
8. With API suport write demo programs for menu display
9. Write a java program to demonstrate threads.
10. Demonstration of FileInput Stream and FileOutputStream Classes

Section B: Shell Scripts and Linux Administration (minimum 10)

1. Shell Script Program to perform all Arithmetic operations
2. Shell Script Program to find simple interest
3. Shell Script Program to find Area of Square, Rectangle, Circle
4. Shell Script Program to print your Address ‘n’ times
5. Shell Script Program to find whether number is even or odd
6. Shell Script Program to find whether number is +ve, -ve or 0

7. Shell Script Program to find Greatest of 3 numbers
8. Shell Script Program to whether year is Leap year or not
9. Shell Script Program to print natural numbers from 1 to 10 using WHILE loop
10. Shell Script Program to print perfect numbers from 1 to 100
11. Shell Script Program to reverse a number
12. Shell Script Program to find whether the given number is perfect or not

- Linux installation, upgradation and rescue.
- Boot loader configuration using GRUB
- Managing the run level.
- Starting and stoping services in runlevel.
- The service command
- Manging process- viewing status, killing , restarting etc using ps.
- Adding and deleting user accounts, changing passwords.
- Changing the environment variables like PATH
- Scheduling jobs using cron
- Managing kernel modules
- Mounting and unmounting external file systems
- Setting the value of umask, changing the permissions, changing owner and groups
- Installation and removal of packages
- Installation of a peripheral devices (e.g printer)
- Archiving and Backup using tar. Restoring backup
- Compressing and uncompressing files using any one tool

SEMESTER V

5B13BCA
SOFTWARE ENGINEERING

Hours per Week : Theory - 4 **Credit: 3**

Objectives *:*

- *Understand the basic processes in software Development life cycle.*
- *Familiarize with different models and their significance.*
- *Approach software development in a systematic way.*
- *To familiarize students with requirement engineering and classical software design techniques.*
- *To familiarize with various software testing techniques and tools.*

Module 1:

Introduction to software engineering-Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

Module 2:

Software Requirement Analysis and Specification – Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

Module 3:

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function oriented design, IEEE recommended practice for software design descriptions.

Module 4:

Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

Module 5:

Software Testing – What is testing, Why should we test, who should do testing? Test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing , techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing; structural testing , path testing , Graph matrices , Data flow testing , levels of testing ,unit testing , integration testing , system testing , validation testing

Text Book:

1. Software Engineering (Third Edition), K K Aggarwal, Yogesh singh, New age International Publication (For unit 1,2,3,5 and case study of unit 4)
2. An integrated approach to software Engineering (Second Edition), Pankaj Jalote , Narosa Publishing House - (For Unit 4)

References:

1. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley
2. Software Engineering A practitioners approach (Sixth Edition), Roger S Pressman - Mc Graw Hill.
3. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli - Pearson Education

Model Question Paper
5B13BCA SOFTWARE ENGINEERING

Time 3 Hours **Max.Marks:40**

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
   a) _____ is the way in which we produce software.
   b) Expansion of CASE is _____
   c) Level 0 DFD is also called _____
   d) FAST stands for _____
   e) X and Y have no conceptual relationship other than shared code then the cohesion is called _____
   f) UML stands for _____.
   g) _____ is the process of executing a program with the intension of errors.
   h) _____ is the process of confirming that software meets the customers requirements.

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. What is software process?
3. What is product matrices?
4. Write a note on SRS.
5. What is requirement validation?
6. Define Software design.

7. What is bottom up strategy of design?
8. What are the steps to analyze and design Object Oriented System?
9. Write a note on Abstraction.
10. What is test case and test suite?
11. Define white box testing.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. What are the important software characteristics?
13. Discuss about requirement elicitation.
14. Write a note on types of design.
15. What are the basic concepts of Object Oriented Design.
16. Write a note evolutionary data model.
17. Write a note on various levels of testing..

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Discuss Waterfall model in detail.
19. Explain various steps of requirement analysis.
20. Write a note on Module Coupling.
21. Explain various techniques to design test cases..

5B14BCA

DATA COMMUNICATION & NETWORKS

Hours per Week : Theory - 4 **Credit: 3**

Objectives *:*

- *Understand the basics of data communication*
- *Familiarize with OSI reference model*
- *To familiarize students with layers of communication model*
- *To introduce concepts of network security*

Module I

Introduction to data communication, important elements /components of data communication, Data transmission- Analog, Digital. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, Man. Network software – protocol hierarchies. design issues for layers, interfaces and services- connection oriented, connection less.

Module II

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / Ip models.Data Link Layer , Design issues, Services to network layer, Framing- charater count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.

Module III

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow based routing, hierarchical routing, congestion control algorithms – the leaky bucket algorithm, the token bucket algorithm.

Module IV

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP

Module V

Application layer, network security, traditional cryptography, substitution ciphers, transposition ciphers, fundamental principles, secret key algorithm, data encryption standard, DES chaining, DES breaking. Public key algorithm, RSA algorithm.

Text books

1. A S Tanenbaum . Computer Networks TMH

References

1. B Forousan, Introduction to data communication and networking
2. Data communication and Networks, Achyut S. godbole, TMH
3. Computer Networks – fundamentals and Applications, Rajesh, Easearakumar & Balasubramaian, Vikas pub.

Model Question Paper
5B14BCA DATA COMMUNICATION & NETWORKS

Time 3 Hours **Max.Marks:40**

SECTION A

1. One Word Answer **(8 X 0.5 = 4 marks)**

a. The transfer of data in the form of electrical signals or continuous waves is called _____.

b. The _____ is in between each pair of adjacent layers and defines the primitive operations and services of the lower layer.

c. The _____ protocol has neither flow control nor error control.

d. The network layer deals with _____ transmission.

e. The coding of data for security is called _____.

f. In TCP the connection is established using a technique called _____.

g. OSI stands for _____.

h. The hierarchical routing uses the idea of dividing routes called _____.

SECTION B

Write short notes on ANY SEVEN of the following questions (7 X 2 = 14 marks)

2. What are the design issues of network layer?
3. What is meant by congestion?
4. What is cryptography?
5. List the file transfer protocols?
6. What is the need of error control?
7. What is meant by character stuffing?
8. Explain simplex transmission?
9. Define a computer network.
10. What is meant by parallel transmission?
11. What is service point addressing?

SECTION C

Write short notes on ANY FOUR of the following questions (4 X 3 = 12 marks)

12. Explain transposition ciphers.
13. Compare between TCP and UDP.
14. Explain flow based routing.
15. Explain Framing.
16. .What are the functions of presentation layer?
17. Briefly explain unicast, muticast and broadcast.

SECTION D

Write short notes on ANY SEVEN of the following questions (2 X 5 = 10marks)

18. Explain ISO-OSI reference model.
19. List and explain elementary protocols used in DLL.
20. Explain different types of routing.
21. Explain the various methods for providing network security.

5B15BCA
ENTERPRISE JAVA PROGRAMMING

Hours per Week : Theory - 4 Practical – 4 Credit: 3

Objectives

1. *To understand the Enterprise Java platform*
2. *To provides an API and runtime environment for developing and running large-scale*
3. *To develop programming skills in multi-tiered, scalable, reliable, and secure network application*

Module I

Java Database Connectivity: JDBC architecture; Drivers, JDBC-ODBC bridge, native API partly java driver, Net Protocol all Java driver, Native protocol all Java driver; Connecting to Database; statements; Multiple result sets; Large data types; Handling Errors; SQL warning; Metadata, database meta data, result set meta data

Module II

Remote Method Invocation: RMI architecture; RMI Object services; Naming/registry service, object activation service, distributed garbage collection; Defining Remote objects; Key RMI classes for remote object implementations; Stubs and skeletons; Accessing remote object as a client; Remote method arguments and return values; Factory classes; Dynamically loaded classes; Configuring clients and servers for remote class loading;

Module III

Java Servlets: Life cycle; HTTP Servlets, forms and interaction; POST**,** HEAD and other requests; Servlet responses; Servlet requests; Error handling, status codes; Servlet chaining; Custom Servlet Initialisation; Thread safety; Server side includes; Cookies; Session tracking

Module IV

Common Object Request Broker Architecture: Introduction to CORBA, About Object management group, CORBA architecture, architectural similarities, CORBA versus Java RMI, CORBA services, CORBA facilities-Vertical CORBA facilities, Horizontal facilities. CORBA domains. IDL Compiler, Interface definition language, IDL stub, IDL Skelton interface , Repositories, Object request broker; Naming service;

Module IV

Inter-ORB communication; Creating CORBA objects; IDL, modules, interfaces, data members and methods; IDL and Java; Simple server class, helper class, holder class, client and server stubs; Initializing ORB, Registering with a naming service; Adding objects to a naming context; Finding remote objects; Initial ORB references;

Reference:

- Java Enterprise in a nutshell by David Flanagan and Jim Parley, O'Reilly Associates

Model Question Paper

5B15BCA ENTERPRISE JAVA PROGRAMMING

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a) The _____ package is importd when working with JDBC.
b) The method Class.forName() throws the _____ exception.
c) CORBA stands for _____
d) CLOB means _____
e) The _____ method of the class Statement is used to get a single result set from a select query.
f) In Java tables are manipulated as _____
g) RMI stands for _____
h) ORB means _____

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. What is SQL exception?
3. What are Factory classes?
4. What are cookies?
5. What is CORBA?
6. What are the packages used in a servlet API?
7 .What is RMI?
8. What are BLOB and CLOB?
9. List the different kinds of statements in JDBC.
10. What is an Activatable Remote Object?
11. What is IDL?

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12.What are activation groups?
13. Describe Java classes generated in an IDL interface.
14. What is a CORBA naming service?
15. Explain resource abstraction.
16. Describe servlet chaining.
17. Explain error handling in servlets

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. With suitable examples explain Database MetaData and ResultsetMetaData.
19. Describe the elements of the Servlet API.
20. Explain the RMI architecture, with a diagram.
21. Explain the CORBA facilities.

5B16BCA

C# AND .NET PROGRAMMING

Hours per Week : Theory - 3 Practical - 4 Credits : 2

Objectives

- *To expose students to current trends and styles in programming*
- *To familiarize simple, modern, general-purpose, object-oriented programming language.*

Module I

Introduction to C# - Evolution , Characteristics, applications.Understanding .NET-Origin of .NET Technology, .NET Framework, Common Language Runtime (CLR), .NET Approach. Overview of C#- Program Structure, A Simple C# Program, Namespaces, CommandLine Argument, Errors.

Module II

Basic concepts of Programming: Literals, Variables, Boxing and Unboxing, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

Module III

Object Oriented aspects of C# ,Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Multithreading.

Module IV

Application Development on .NET Web Applications – Web form Fundamentals, Web form Events, Webform Life cycle, Creating a Web Application, Web Srvices. Windows Applications – Creating a Windows Application.

Module V

Database Access and .NET Components Accessing Data with ADO.NET Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting.

Text Books

1. Programming in C#, E.Balagurusamy (Unit I, II)

2. Programming in C#, J. Liberty 2nd Edition – O'Reilly (Unit III, IV, V)

Reference

1 C# Programming Bible, Jeff Ferguson, Brian Patterson, Jason Beres, Wiley Publishing Inc., Reprint 2006.
2 Programming .Net , Jeff Prosise, , 2nd Edition, WP Publishers & Distributors Pvt. Ltd, 2009.
3 Professional .Net Framework , Kevin Hoffman & Jeff Gabriel, , 1st Edition, Wrox Press Publishers, 2006.

Model Question Paper

5B16BCA C# AND .NET PROGRAMMING

Time: 3 Hours **Max Mark: 40**

SECTION- A

1. **One Word Answer** **(8*0.5= 4 Marks)**

a. C# is known as the first …… language
b. MSIL means ……
c. .NET framework is one of the tools provided by ……
d. An inherent characteristic of IL code is ……..
e. Value constant assigned to variable in a program is known as …..
f. The ability to take more than one form is known as ……..
g. for is a …… control loop.
h. Web pages can have both HTML and …… controls

SECTION- B

Write short notes on ANY SEVEN of the following questions (7*2=14 Marks)

2. What is .NET Framework?
3. What is Common Type System?
4. What is method overloading?
5. What are arithmetic expressions?
6. What is Web Services?
7. What is .NET Assembly?
8. What is reflection?
9. What are Compile time errors?
10. What is containment inheritance?
11. State at least five most important highlight of c# language

SECTION - C

Answer ANY FOUR of the following questions (4*3=12 Marks)

12. Discuss Enumeration with example?
13. Describe the structure of typical c# program.
14. What are private and shared assemblies?
15. Discuss differences between class and structure with example.
16. How does C# differ from Java ?
17. Explain webform events.

SECTION- D

Answer ANY TWO of the following questions (2*5=10 Marks)

18. Explain the steps to develop a web application with a simple example.
19. Explain Webform life cycle.
20. Explain CLR and its Components.
21. Explain ADO .NET

SEMESTER VI

6B17BCA
WEB TECHNOLOGY

Hours per Week : Theory – 2 **Credits : 2**

Objectives

1. *To enable students to program for the World Wide Web using HTML, JavaScript, PHP and MySQL.*
2. *To create static and dynamic web pages PHP and My SQL.*
3. *To impart basic knowledge in relational databases, SQL and , Client-server model.*

Module -1:

Introduction to internet and web, An overview of internet programming –WWW design issues. Introduction to HTML-structure of HTML,tags,attributes,syntax of tags ,starting and ending tags,html doc elements-<html>,<title>,<body>,physical style tags,listing,labeling,grouping, <img>-<a>

Module-2:

Table tags-<tr>,<td>,<th> attributes-height,width,rowspan,colspan, border,color.

Form-tagattributes-type-passwd,submit,radio,check,method,action.Frame-<frame>,

<frameset>, <iframe>,<noframe> and other important tags and attributes.

Module-3

Javascript-datatypes,variables,function,object,array.Client-side object hierarchy and document.object Model,<script>,event handlers,javascript in urls.Windows and frames-dialog boxes,status line,navigator object,opening Windows,closing windows,Location object,history object.- Date object- math object- Accessing form object.

Module-4:

Intro to PHPand advantages of ,PHP basic-functions,string,array,object,web techinniques, database.

Module-5

Client-server model, introduction to cgi,environment variables, request-response model, encoding and decoding form data. Simple programming in CGI- databse.

Text Books:

1.HTML-Definitive Guide O'reilley
2.Programming in PHP O'reilley
3.Programming in CGI O'reilley
4.Javascript-Definitive Guide O'reilley

Reference:

1.Complete reference in PHP-Steven Hozner
2.Beginning PHP5 (Wrox Programer)
3.Complete reference HTML-Tata McGraw Hill

Model Question Paper
6B17BCA WEB TECHNOLOGY

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. Answer the following questions in one word (8 x 0.5 = 4 marks)

a. WWW stands for ……
b. Which tag is used for labeling?
c. action is an attribute of ……..tag.
d. The tag used to make hyper link is ……..
e. Which tag is used to embed javascript codes within HTML page?
f. The dialog box used for getting some input from the user is created using …….
g. HTML stands for…….
h. The statement used to print in PHP is ……

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Write a note on WWW.
3. What is the structure of an HTML document?
4. What is meant by a form? What are the important attributes of <form> tag?
5. Write a note on Javascript.
6. Explain arrays in JavaScript.
7. What is meant by events and event handlers?
8. What is meant by DOM?
9. What is meant by client server model?
10. Write the code for inserting an image to the web page.
11. What are the different methods to access databases from PHP?

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Differentiate between Get and Post.
13. Explain functions in PHP.
14. What are the different types of flow control statements in PHP?
15. List and explain any four physical style tags with examples.
16. What are the different types of dialog boxes?
17. What is meant by relational databases?

SECTION D

Write an essay of ANY TWO of the following questions (2 x 5 = 10 marks)

18. What is the importance of HTTP in web? Explain the HTTP request response cycle.
19. What is meant by Table? What are the tags used for table creation? What are the different attributes? Illustrate with an example.
20. Design an application form with suitable controls and buttons. Make it dynamic using scripts.
21. Design a webpage for your college with frames, images and suitable hyper links.

6B18BCA

DATA MINING & DATA WAREHOUSING

Hours per Week : Theory - 4 **Credits : 3**

Objectives

- *To expose to the students the introduction to data mining and data warehousing.*
- *To understand the data management aspects data pre processing model and inference considerations, complexity considerations, post processing of discovered structures visualization and online updating*

. **Module I**

Introduction; data warehousing – what is, Multidimensional data model, OLAP operations, warehouse schema, Data warehousing Architecture, warehouse server, Metadata, OLAP engine, data warehouse Backend Process.

Module II

Data mining – what is, KDD vs data mining, DBMS vs data mining, DM Techniques, issues and challenges, Applications. (Case studies) *

Module III

Association rules – What is, Methods, a priori algorithm, partition algorithm, Pincer-search algorithm, FP-tree growth algorithm, incremental and Border algorithms, Generalized Association rule.

Module IV Clustering techniques – Paradigms, Partitioning Algorithms, k – Medoid algorithms, CLARA, CLARANS, hierarchical clustering, DBSCAN, Categorical Clustering, STIRR.

Module V

Decision trees – what is, tree construction principles, Best split, Splitting indices, Splitting criteria, decision tree construction algorithms, CART, ID3, C4.5, CHAID. Introduction to web, spatial and temporal data mioning.

Text book :

1. Data Mining Techniques, A K Pujari, University press.

Reference :

1. J. Han, M. Kamber, “Data Mining Concepts and Techniques”, Harcourt India Pvt Ltd.
2. M. Dunham, “ Data Mining : introductory and Advanced Topics”, Pearson Pub.

Model Question Paper
6B18BCA DATA MINING & DATA WAREHOUSING

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a) ____ operation is also known as roll-up operation.
b) _____ is also called level wise algorithm.
c) _____ is the process of extracting data for warehouse from various sources.
d) _____ attempts to stop growing the tree before outfitting occures, thus avoiding Pruning phase.
e) In _____ a recursive procedure is used to construct a decision tree from data.
f) _____ servers support multidimensional view of data through array based data warehouse servers.
g) _____ is a bridge between data warehouse and the decision support application.
h) _____ produces trees with variable branches per node.

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. List out the stages of KDD
3. Explain about CHAID.
4. What is a maximal frequent set?
5. What is PAM?
6. What is a border set?
7. What is CLARANS?
8. What is ROLAP?
9. Explain about data extraction.
10. How data mining is useful field of business and E-commerce?
11. Discuss about webmining.

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. Discuss in detail about the concept of spatial Data mining.
13. Describe the working of Pinies search algorithm.
14. Compare the performance of CLARA with CLARANS.
15. With sufficient diagram explain about data warehouse architecture.
16. Define decision tree. Discuss about the tree construction principles.
17. Describe the working of DBSCAN algorithm.

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. Explain k – Medoid algorithms.
19. Explain hierarchical clustering.
20. Discuss about:
    a) Fp tree growth algorithms.
    b) Data warehouse backend process.
21. Write notes on: a) Categorical clustering b) Temporal data mining algorithms.

6B21BCA
SYSTEM SOFTWARE

Hours per Week : Theory - 3 **Credits : 2**

Objectives :

1. *Introduce formal language processing activities.*
2. *Basic idea of assembly language programming and role of assembler.*
3. *Insight into Design of assemblers and macro processors.*
4. *Concept of Macros and Macro pre-processors.*
5. *Overview of various aspects of compilers.*
6. *Concepts and design aspects of linkers and loaders*.

Module I

Introduction – Evolution – Language processing activities – Fundamentals of language processing and specification – Development tools – Data structures for language processing

Module II

Scanning and parsing – Elements of ALP – Assembly scheme – Pass structure of assemblers – Two pass assembler – Single pass assembler

Module III

Macros: Definition and call – Expansion – Nested macro calls - Advanced macro facilities – Macro preprocessor.

Module IV

Compiler: Compilation – Memory allocation – Compilation of expressions and control structures – Code optimization – Interpreters.

Module V

Linker: Design – Relocation and linking – Self relocating programs – Linker for MS DOS – Linking for Overlays – Loader – Software tools – Editor – Debug monitor – Programming environment – User interface

Text Book:

D M Dhamdhere, “Systems Programming and Operating Systems”, Tata McGraw-Hill

Reference:

John J Donovan, “Systems Programming”, Tata McGraw-Hill

Model Question Paper
6B21BCA SYSTEM SOFTWARE

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a) _____ is a finite sequence of symbols.
b) Mnemonic operation codes are found in _____
c) _____ govern the information of valid lexical units in the source language.
d) The process of isolating lexical units of a sequence is called _____
e) The _____ direct the assembler to take certain actions during the process of assembling a program.
f) Addresses are kept track by using a _____
g) _____ is the semantic gap between two specifications of the same task.
h) Intermediate code generation phase gets input from _____

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. What is an overlay?
3. What are macros?
4. What is an absolute loader?
5. What are the aspects of compilation?
6. What is an interpreter?
7. What are search and allocation datastructures?
8. List the tasks performed by the synthesis phase of an assembler.
9. What is Type – 0 grammer?
10. What are the fundamental steps in program development?
11. What is semantic expansion?

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. Explain two pass assembly scheme.
13. Explain static and dynamic memory allocation.
14. Write a note on debug monitor.
15. What is an object module? Give example.
16. Explain ambiguity in grammars with an example.
17. What are the different parameter passing mechanisms? Explain.

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. Describe about software tools.
19. Explain in detail, the tasks performed by Pass 1 of a two pass assembler.
20. What is Heep datastructure? Explain memory management in Heap.
21. Explain LL(1) parser with an example.

6B22BCA LAB – V
ENTERPRISE JAVA PROGRAMMING

Credits : 3

Sample Program List

1. Develop five demo programs that includes all the concepts of JDBC
2. Develop Three demo programs that includes all the concepts of RMI
3. Develop five demo programs that includes all the concepts of Java Servlets
4. Develop two simple demo programs that includes all the concepts of CORBA

6B23BCA Lab – VI
.NET Programming

Credits : 3

Sample Program List

Practice all the programs in the lab.

1. To implement output parameter and reference parameter
2. To implement the concept of indexers
3. To implement the concept of sealed class
4. To implement the concept of namespace
5. To implement the concept of interfaces
6. To implement the concept of events
7. To implement exception handling
8. To design a calculator in windows form
9. To implement data controls in windows form
10. To implement validation controls in web form

6B24BCA Lab – VII
Web Technology

Hours per Week : Practical - 3 **Credits : 2**

Guidelines

1. *Follow standard coding method*
2. *The output of the program should be neatly formatted*
3. *Practice all the programs in the lab*

Sample Program list

1. Develop an HTML page using all basic tags
2. Develop an HTML page containing all types of lists
3. Write an HTML code to insert an image into the web page. Use the attributes height, width and border. Also align some text with respect to the images
4. Create a web page giving the following train details in a tabular form with the heading Train Time Table.
5. Train name, starting place, destination, arrival and departure time and fare
6. Create an HTML page with images. Clicking on the images should lead to external documents.
7. Form Validation using Java Script
8. Create a web page for your college using frames, images and hyper links
9. Create an email registration form. Give necessary validations
10. Write a JavaScript code using arrays
11. Create a web page that illustrate the onMouseOver and onMouseOut event handlers
12. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation
13. Write a Javascript program to display the current time
14. Write a Javascript program to print the prime numbers within a range
15. Write a Javascrpt program to show the working of alert()
16. Write a JavaScript program to find the factorial of a number.
17. Form Processing using PHP
18. Form validation using PHP
19. Storing data in MYSQL using PHP

6B25BCA LAB – VIII
PROJECT

Hours per Week : Practical - 5 **Credits : 4**

Project Guidelines

The minimal phase for the project are: project search finalization and allocation, investigation of system requirement data and process Modeling system design program design, Program coding and Testing Procedures done, and system implementation procedures.

Project planning:

The BCA Major Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions first internal project viva voce should be completed in the first term of final year.

Selection of the project work

Project work could be of three types.

Developing solution for real life problem

In this case a requirement for developing a computer-based solution already exits and the different stages of system development life cycle is to be implemented successfully. Examples are accounting software for particular organization, computerization of administrative function of an organization, web based commerce etc. The scope for creativity and exploration in such projects is limited but if done meticulously valuable experience in the industrial context can be gained.

b) Innovative Product development

These are projects where a clear-cut requirement for developing based solution may not existing but a possible utility for same is conceived by the proposer. An example is a Malayalam language editor with spell checker, hand written character processing.

c) Research level project

These are projects which involve research and development and may not be as a structured and clear cut as in the above case. Examples are Malayalam character recognition, Neural net based speech recognizer etc. This type of projects provides more challenging opportunities to students, but at BCA level this may be a difficult choice. If any student identifies proper support in terms of guidance technology and reference from external organizations and also the supervisors are convinced of the ability of the

student(s) to take up the project it shall be permitted. The methodology and the reporting of such project could be markedly different from type (a) and is left to the proposer/external supervisor of the project.

Selection of team

To meet the stated objectives, it is imperative that major project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with three or four members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if student are doing project as groups each one must independently taken different modules of the work and must submit the report.

Selection of Tools

No restrictions shall be placed on the students in the choice of platform / tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

Selection of external organization & Guide.

No restriction shall be placed on the student in the choice of external organization, where project work may be done, in terms of locality type (Private/ public) etc. It is the duty of the Head of Institution / Principal of the college to ensure that the aims, objectives and full project guidelines are communicated to the external organization. The guide should ideally be a postgraduate with work experience.

Students may also choose to do project in the college/institute especially product based work but in such cases the supervisors must ensure that

(I) Industry practices are followed

(II) the student undertake a planned visit to an IT industry with international operations to make up for the loss of experience

(III) the service of an external guide with industry experience is obtained.

Project management

Head of the Department /principal of the college should publish the list of students project topic, internal guide and external organization and teams agreed before the end of July. Changes in this list may be permitted for valid reasons and shall be considered favourably by the Head of the Department /principal of the college any time before commencement of the project. Students should submit a fortnightly report of the progress, which could be indication of percentage of completion of the project work. The students should ideally keep a daily activity book. Team meeting should be documented and same should be submitted at the end of the project work.

Documentation

Three copies of the project report must be submitted by each student (one for department library, one for the organization where the project is done , one for the external examiner and one for the student himself/herself). After affixing signature of external examiners two copies will be returned at the time of the viva which are for the external organization and for the candidate. A CD containing soft copy of the project report, source code and binaries recorded in different folders should also be submitted for the documentation in the library. The CD also should bear the name of the student , title of the project, year etc. the format for preparation of the project is standaerized from 2007 onwards. The following are the major guidelines. The final outer dimensions of the project report shall be 21cm X30 cm.the colour of the flap cover shall be light green/blue. Only hard binding should be done, with title of thesis and the words "<BRIEF TITLE> BCA Project Report 201…"displayed on the spine in 20 point , bold , Arial, as in example below. In case the title is too long, a shorter version of it may be used.

- The text of the report should be set in 12 pt , bookman , 1.5 spaced.
- Headings should be set as follows: CHAPTER HEADINGS 20 pt, Arial, Bold, All caps, Centered.
- Section Headings 14 pt Bookman old style, Bold, Left adjusted.
- Section Sub-heading 12 pt, Bookman old style.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.

Content of the Project should be relevant and specify particularly with reference to the work. The report should contain the requirement specification of the work, Analysis, Design, Coding, testing and Implementation strategies done.

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system
- The Proposed system- Its advantages and features

- Context diagram of the proposed system.
- Top level DFD of the proposed system with at least one additional level of expansion
- Menu Tree
- Program List (Sample code of major functions used)
- Files or tables (for DBMS projects) list. Class names to be entered for each file in OO systems.
- List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Screen layouts for each data entry screen.
- Report formats for each report.

Some general guidelines on documentation are:

1. Certificate should be in the format **:" Certified that this report titled……is a bonafide record of the project work done by Sri/ Kum ……under our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of Bachelor of Computer Application (BCA) of the Kannur University**" with dated signature of internal guide, external guide and also Head of the Department/ College.

2. If the project is done in an external organization, another certificate on the letterhead of the organization is required: **"Certified that his/her report titled ……is a bonafide record of the project work done by Sri/Kum…….under my supervision and guidance, at the ……..department of…… (Organization) towards partial fulfillment of the requirement for the award of the Degree of Bachelor of Computer Application of the Kannur University**.
3. Page numbers shall be set at right hand bottom, paragraph indent shall be set as 3.
4. Only 1.5 space need be left above a section or subsection heading and no space may be left after them.
5. References shall be IEEE format (see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.

Project evaluation: Internal Assessment (Ref: General guidelines)

There shall be four components that will be considered in assessing a project work with weightage as indicated.

- Timely completion of assigned tasks as evidenced by team meeting minutes 20% or 2 marks
- Relevance of topic System study / Design of table/Individual involvement, team work and adoption of industry work culture 20% or 2 marks
- Project report Quality of project documentation (Precision, stylistics etc)/Achievement of project deliverables 30% or 3 marks
- Viva Effective technical presentation of project work 30% or 3 marks

Based on the above 4 components internal mark (10)can be awarded.

Dissertation /Project to be submitted at the end of third year shall be valued by two examiners appointed by University for the conduct of practical exam. The board of examiners shall award 40 marks based on the following components given in the table below.

External (80% of Total)		
Components	**% of Marks**	**Marks**
Written Synopsis/Abstract	12.5	5
Content of the Project	12.5	5
Quality of project work/Use of software/ tools	12.5	5
Perfection of the work (Designs of tables/ Input & Output forms)	25	10
Live demo	12.5	5
Viva-Voce	25	10
Total	**100**	**40**

5D01BCA
PROGRAMMING WITH C

Contact Hours/Week: Theory 2 Credit: 2

Module I

The C character set, Identifiers and keywords, Classes of Data Types, constants, variable declarations. Expressions, statements, operators and expressions: arithmetic operators, unary operators, relational operator, logical operators, assignment operator, the conditional operator. Library functions: data input and output functions like getchar(), putchar(),scanf(), printf(), gets and puts.

Module II

Control statements: Branching: The if-else statements. Looping: The while, do-while and for loops. The switch statements, Break and continue, comma operator.

Module III

Functions**,** Defining a function, accessing a function, function prototype, passing arguments to a function, Returning from a function, recursion, program structure. Storage classes: automatic, static, register and extern(global).

Module IV

Arrays, Structure and Union : Defining an array, processing an array, passing arrays to functions, multidimensional arrays. Structure and union. Defining a structure, processing a structure. union.

Module V

Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strrev.

Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

Reference

1. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
2. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1 edn, Pearson Education.
3. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,
4. Programming with C in Linux, NIIT, PHI.
5. C by Example, Noel Kalicharan, Cambridge University press.

Model Question Paper
5D01BCA PROGRAMMING WITH C

Time: 2 Hrs **Max. Marks: 20**

SECTION A

1. **Answer in one word** **(8 x 0.5 = 4 marks)**
   a. A for loop with no test conditions is known as -------- loop.
   b. The function ..... is used to determine the length of a string.
   c. For using character functions, we must include ---------- header file in the program.
   d. A function that call itself is known as a ..... function.
   e. Break statement is used to break from a ----------
   f. Which keyword is used to declare a global variable?
   g. Union data type allocates same memory location for all the members (True/False)
   h. String is a ----------

SECTION B

Write short notes on ANY THREE of the following questions (3 x 2 = 6 marks)

9. Differentiate between structure and union.
10. What are C Tokens.
11. How will you read and write a character in C.
12. List and explain logical operators in c.
13. Write if statements required to find the minimum of three integers i, j and k.

SECTION C

Answer ANY TWO of the following questions (2 x 3 = 6 marks)

14. With suitable examples, explain break and continue statements.
15. With suitable example(s), explain parameter passing techniques in c functions.
16. What is an array? Write a program to read values to an array and display the largest among them.
17. Distinguish between while and do while loops with examples.

SECTION D

Write an essay on ANY ONE of the following questions (1 x 4 = 4 marks)

18. With suitable examples explain the following:
    1. Switch statement.
    2. Recursive function.
    3. Conditional compilation.
    4. Structure Data type
19. Explain the different data types in C.

5D02 BCA
WEB TECHNOLOGY

Contact Hours/Week: Theory 2 Credit: 2

Module -1:

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

Module-2:

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd,submit,radio,check,method,action.

Module-3:

Frames-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes. Simple programs using frames.

Module-4:

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls. Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object- math object- Accessing form object.

Module-5:

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions.

Text Books:

1. HTML-Definitive Guide O'reilley 5th edn
2. Javascript-Definitive Guide O'reilley 6th edn

Reference:

1. Programming in PHP O'reilley
2. Complete reference in PHP-Steven Hozner
3. Beginning PHP5 (Wrox Programer)
4. Complete reference HTML-Tata McGraw Hill

Model Question Paper
5D02 BCA WEB TECHNOLOGY

Time: 2 Hrs **Max. Marks: 20**

SECTION A

Answer in one word **(8 x 0.5 = 4 marks)**

1. WWW stands for ……
2. Which tag is used for labeling?
3. action is an attribute of ……..tag.
4. The tag used to make hyper link is ……..
5. Which tag is used to embed javascript codes within HTML page?
6. The dialog box used for getting some input from the user is created using …….
7. HTML stands for…….
8. The statement used to print in PHP is ……

SECTION B

Write short notes on ANY THREE of the following questions (3x 2 = 6 marks)

9. Write a note on Javascript.
10. What is meant by events and event handlers?
11. What is the use of <noframe> tag?
12. How can you create arrays in PHP ?
13. Explain the Location object.

SECTION C

Answer ANY TWO of the following questions (2x 3 = 6 marks)

14. Explain the creation of frames in HTML.
15. Write short note on the Date object.
16. List the advantages of PHP.
17. Explain the different physical style tags.

SECTION D

Write an essay on ANY ONE of the following questions (1 x 4 = 4 marks)

18. Explain the creation of different types of lists in HTML with examples.
19. Different types of operators in Java Script.

5D03BCA

DATABASE MANAGEMENT SYSTEM

Contact Hours/Week: Theory 2 Credit: 2

Module I

Introduction–Field,Record,Entity,Attribute,Relation,Domain,Tuple-Advantages of database systems- data models (Network model, Hierarchical Model, DBTG CODASYL model, Relational Model(E-R)) - system structure.

Module II

Database administrator- data base users, Constraints(Primary, Foreign, Candidate, Unique)- Relational Algebra (Union, Intersection, Difference, Product, Project, Selection).

Module III

Normalization (First, Second, Third, Fourth, BCNF),SQL: Introduction To SQL-Tables DDL, DML, DCL (In Detail), Data Types.

Module IV

SQL Functions(Different Types of Functions),Operators(Arithmetic, Relational, Logical), Sub Quires (in Detail), Clauses(Having, Group By)

Module V

Joins(Different Types of Join Statements),View, Introduction to Sequence, Index and Triggers

Textbook:

1. Data Base Concept 3 edition Abraham Silberschatz, Henery f Korth McGraw Hill

2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley

Reference:

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley

2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann.

3. Principles of Database & Knowledge Jeffrey D. Ullman, Computer Science Press, 1988

Model Question Paper
5D03BCA Database Management System

Time: 2 Hrs **Max. Marks: 20**

SECTION A

Answer in one word **(8 x 0.5 = 4 marks)**

1. The collection of information stored in the database is called…….
2. The data hold across the primary key column must be_____
3. ---------- is the total no. of entity sets participating in a relationship set.
4. _____ Keys represent relationships between tables.
5. The structure of database is……..
6. ……is the association among several entities.
7. For each attribute there is a set of permitted values is called _____
8. An entity set without having a primary key is called ----------

SECTION B

Write short notes on ANY THREE of the following questions **(3x 2 = 6 marks)**

9. Explain about INSERT command?
10. What is the usage of CREATE command?
11. Which are the different types of attributes?
12. Explain UPDATE command.
13. Define foreign key.

SECTION C

Answer ANY TWO of the following questions **(2x 3 = 6 marks)**

14. Explain the advantages of DBMS?
15. Which are the different types of keys?
16. Explain components of SQL?
17. Write a note on ALTER command?

SECTION D

Write an essay on ANY ONE of the following questions **(1 x 4 = 4 marks)**

18. Explain ER data Model.
19. Write a detailed note on normalization

ELECTIVES – SECTION A

For all the elective papers 4 hours per week and 3 credits will be awarded

6B19BCA - E01

INFORMATION SECURITY

Hours per Week : Theory - 4 **Credits : 3**

Module I

Introduction to Information Security- The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation. Types of attacks- Passive attacks, Active attacks, Virus, Worm, Trojan horse. Introduction to Cryptography, Steganography, Secret Sharing.

Module II Symmetric Key Encipherment:-

Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers - monoalphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers - keyless and keyed transposition ciphers, Stream and Black Ciphers - stream ciphers, block ciphers.

Module III DES(Data Encryption Standard):-

Introduction, DES Structure - initial and final permutations, rounds, cipher and reverse cipher, examples; DES Analysis - properties, design criteria, DES weaknesses; Multiple DES - double DES, triple DES; Security of DES - brute-force attack, differential cryptanalysis, linear cryptanalysis.

Module IV Public key Cryptosystem:

Principles of Public Key Cryptosystems- Public Key Cryptosystem, Applications of Key Cryptosystems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis. RSA Algorithm – Description of the Algorithm, Computational Aspects, Security of RSA.

Module V Digital Signature:-

Comparison- inclusion, verification method, relationship, duplicity; Process- needs for keys, signing the digest; Service- message authentication, message integrity, nonrepudiation, confidentiality; Attacks on Digital Signature- attack types; Digital Signature Schemes- RSA digital signature schemes

Text Books:

1. Cryptography and Network Security", Behrouz A Forouzan, Tata McGraw-Hill Publishing Company Limited, Special Indian Edition 2007. (For Module - I, II, III, V).
2. Cryptography and Network Security Principles and Practices, Willian Stalling, Pearson Education (For Module - IV).

Reference:

1. Fundamentals of computer security, Josef Pieprzyk, Thomas hardjino and Jennifer Sebberry, Springer International Edition 2008

Model Question Paper
6B19BCA – E01 INFORMATION SECURITY

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a. .....means concealling the contents of a message by enciphering.

b. The encrypted message is called .....

c. In a ....., encryption and decryption are done one symbol at a time.

d. In Asymmetric Key Cryptography,private key is used for .....

e. ..... refers to the science and art of transforming messages to make them secure and immune to attacks.

f. What is the valid key length for AES cipher?

g. DES uses a key generator to generate sixteen .....round keys.

h. .....means preventing the denial of previous commitments or actions.

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Distinguish between ecryption and decryption algorithm with eg.
3. Explain different transposition ciphers. Give eg.
4. Write a note on substitution cipher. Give egs.
5. Compare block cipher with stream cipher.
6. Explain the terms cryptography, cryptanalysis, cryptosystem,steganography with egs.
7. List and explain the objectives of Information Security.
8. Write a note on Digital Signatures.
9. Discuss the criteria for evaluating block ciphers.
10. Discuss the single round of DES.
11. How Steganography differs from Cryptography.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Define Passive attack.Write a note on the different types of passive attacks.
13. Explain : a) Virus b) Worm c) Trojan Horse
14. Explain the attack threatening to confidentiality.
15. Explain security services provided by Digital Signatures.
16. Explain RSA Digital Signature Scheme.
17. Distinguish between Symmetric key encipherment and asymmetric key encipherment.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Discuss in detail different polyalphabetical substitution ciphers.
19. Explain RSA algorithm with eg.
20. Explain DES in detail.
21. (i) Explain the different categories of computer virus.
    (ii) Explain in detail Digital Certificate and its structure.

6B19BCA - E02

INFORMATION STORAGE SYSTEM

Hours per Week : 4 **Credits : 3**

Module I

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Module II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to hoststorage provisioning, mapping and operation.

Module III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Module IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM)

Module V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References:

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.

Model Question Paper
6B19BCA-E02 INFORMATION STORAGE SYSTEM

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer

a. A client server system refers to accessing information, processing or storage on a typically more powerful separate system from a less powerful computer (True/False)
b. Which two RAID types use parity for data protection?
c. In SAN storage model, the operating system view storage resources as —— devices
d. Expand SNMP
e. Transport protocol used for XMLCIM is ----------
f. What is the name of the raid module in a linux kernel?
g. What is the most popular use case for public cloud computing today?
h. The term 'Cloud' in cloud computing refers to ----------

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Different types of data.
3. What is SNMP?
4. Explain JBOD.
5. What is cloud computing?
6. Write short note on Data Centre.
7. List the Backup Topologies.
8. What are the limitations of DAS?
9. What is hot sparing?
10. What do you mean by Data proliferation
11. List the cloud benefits.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. Characteristics of cloud computing.
13. Describe Backup Granularity?
14. Explain the Different Types of SCSI?
15. What are the factors that affecting NAS performance?
16. Explain the architectural framework of clouds.
17. Briefly Explain about Disk drive Components?

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Explain the Different forms of Virtualization?
19. Explain the application and services on cloud.
20. Explain the RAID levels.
21. Compare SAN and CAS.

6B19BCA - E03
MOBILE COMMUNICATIONS

Hours per Week : Theory 4 **Credits : 3**

Module I

Introduction – history of wireless communication, A simplified reference model, frequencies for radio transmission, signals, Antennas, signal Propagation, Spread spectrum – DSSS and FHSS, Cellular systems.

Module II

SDMA, FDMA, TDMA and CDMA, GSM – Mobile services, system Architecture, Radio interface, Protocols, Localization and Calling, Handover, Security, GPRS.

Module III

Wireless LAN – infrared versus Radio transmission, IEEE 802.11 – system Architecture, Protocol architecture, Physical Layer, MAC Layer, MAC Management, 802.11b, 802.11a. Introduction to Bluetooth – IEEE 802.15.

Module IV

Mobile IP – entities and Terminology, IP Packet delivery, Agent discovery, Registration, tunneling, IPV6, Introduction to MANET, TCP over 2.5/3G Wireless Networks.

Module V

WAP (1.x) – Architecture, Wireless Datagram Protocol, Wireless Transport Layer security. Wireless Transaction Protocol, wireless Session Protocol, wireless Application Environment, wireless Markup Language, WML script, Introduction to WAP 2.0.

Text book :

1. Mobile communications, Jochen Schiller, 2nd edn, Pearson education. 2.

Reference :

- Wireless Communication Technology, R. Blake, Thomson Delmar, 2003.
- Mobile communication engineering: theory and Applications, W. C. Y. Lee, 2nd edn, Mc Graw Hill international Edn, 1998.
- Wireless digital Communication, Feher, PHI, 199.
- Principles and Applications of GSM, Vijay K. garg & J. e. Wilkes, Prentice Hall, 1999

Model Question Paper
6B19BCA -E03 MOBILE COMMUNICATIONS

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a. The frequency range 3MHZ-30MHZ is called.....
b. TDM stands for.....
c. The data rate of 802.11n is .....
d. What is the frequency level of Skywares
e. Groundwaves have frequencies.....
f. WAP stands for.....
g. A bluetooth network is also called as .....
h. MAC stands for.....

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Explain isotropic radiator.
3. What is BSS?
4. Define ECN.
5. Define IMSI.
6. Explain delayspread.
7. What is sniffstate?
8. What is HomeAgent?
9. What are advantages of infrared technology?
10. Expalin TMSI.
11. What are the propagational behaviour of radiowaves?

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. What is an infrastructure network?
13. What are the three alternatives for implementing an HA?
14. What are the ranges for transmission in wireless communication?
15. What is Agent Advertisements?
16. What is IP in IP encapsulation?
17. What are factors to be considered while deploying appilcation over 2.5G/3G wireless link?

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. What are the terms and entities used in MobileIP? Explain each of them?
19. What are desired characteristics of WLAN products?
20. Explain the Handover procedures in Cellular system?
21. What are the 3 major operations to be done for mobile nodes to communicate each other in Mobile IP communication?

ELECTIVES – SECTION B

6B20BCA - E04

ALGORITHM ANALYSIS AND DESIGN

Hours per Week : Theory - 4 **Credits : 3**

Module 1:

Introduction- Definition of algorithm, Areas of algorithm study, performance analysis, Time and space complexity, asymptotic notations (O, ? , T).

Module 2:

Divide and Conquer – general method, Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Performance measurement of quick sort, selection, Strassen's matrix multiplication.

Module 3:

Greedy method – General method, knapsack problem, job sequencing with dead lines, minimum cost spanning trees, prims algorithm, kruskals algoritms, optimal merge patterns, single source shortest path, optimal binary search trees.

Module 4:

Dynamic programming – General method, multistage graph, allpairs shortest path, single shortest path, 0/1 knapsack travelling sales person problem.

Module 5*:*

Basic traversal and Search techniques – Breadth First Search and traversal, Depth First Search and Traversal, Bi-connected components and DFS; Backtracking – General methods, 8-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Text Book:

1. Ellis Horowitz, Sartaj Sahni, S Rajasekharan – Computer Algorithms/C++ - Second Edition, Universities press, 2008 (Paperback Edn)

Reference:

1. Introduction to the design and Analysis of Algorithms, Anany Levitin, 2nd Edn, pearson education.

Model Question Paper
6B20BCA - E04 ALGORITHM ANALYSIS AND DESIGN

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a. An identifier begins with a .....
b. The magic square is represented using ..... having n rows and n columns.
c. A graph is said to be ..... if it acan be drawn in a plane in such a way that no two edges cross each other.
d. Performance measurement is concerned with obtaining ..... requirements of a particular algorithm.
e. Two search strategies are ..... and .....
f. The number of edges in a graph G of degree of any vertex can be determined in ..... times.
g. Sum of degrees of vertices of undirected graph is ..... the number of edges.
h. A connected component of an undirected graph is called.....

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2. What do you mean by an algorithm?
3. Write an algorithm for Greedy method control abstraction for subset paradigm.
4. Explain Optimal merge pattern.
5. Explain dynamic programming.
6. What is multistage graphs?Explain with eg.
7. Explain 8-queens problem.
8. What do you mean by Hamiltonian cycles?
9. Explain Graph coloring with an eg.
10. Write down the algorithm for Select2.
11. Define space complexity and time complexity of an algorithm.

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12. Describe Strassen's matrix multiplication
13. Define algorithm for binary search
14. Write algorithm for merge sort and quick sort
15. Explain algorithm for greedy strategies for the knapsack problem
16. Explain Knapsack travelling salesperson problem
17. Techniques for binary trees

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18. Determine optimal r values for worst case and average performance of function select
19. Explain minimum cost spanning tree in the case of Prim's algorithm and Kruskal's algorithm.
20. Explain job sequencing with deadlines.
21. Compare breadth first search and depth first search techniques

6B20BCA - E05
NETWORK PROGRAMMING

Hours per Week :Theory - 4 **Credits : 3**

Module I

Introduction – A Simple Day Time Client – Protocol Independence – Error Handling – A Simple - Day Time Server.The Transport Layer : TCP, UDP – TCP Connection Establishment and Termination – TIME_WAIT State – Port Numbers – Concurrent Servers – Buffer Size and Limitations – Standard Internet Services – Protocol Usage by Common Internet Applications.

Module II

Socket Introduction – Socket address Structures – Byte Ordering Functions – Byte Manipulation Functions – Elementary TCP Sockets – socket , connect, bind, listen, accept, fork and exec, close, getsockname and getpeername functions

Module III

TCP Client/Server Example – TCP Echo Server - main(), str_echo() – TCP Echo Client -main(), str_cli() – startup – termination – Shutdown of Server Host.

Module IV

Socket Options – getsockopt and setsockopt functions – Socket States – Generic Socket Options – TCP Socket Options.

Module V

Name and Address Conversions - DNS – gethostbyname – gethostbyaddr – getservbyname – getservbyport – getaddrinfo – freeaddrinfo – host_serv – tcp_connect – tcp_listen functions.

Text Book

1. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, “Unix Network Programming The Sockets Networking API Volume I”, Pearson Education

Reference

1. Barry Nance, “Network Programming in C” , Prentice Hall

Model Question Paper
6B20BCA - E05 NETWORK PROGRAMMING

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer

a. The getsockopt() function return ----------
b. DNS stands for ----------
c. fork system call is used for ----------
d. UDP means ----------
e. ---------- is the default port no. for HTTP communication.
f. The function getservbyport() return ----------
g. bind system call is used for ----------
h. ---------- option is used to send packets without delay while sending small packets.

SECTION B

Write short notes on ANY SEVEN of the following questions (7 x 2 = 14 marks)

2. Differentiate exit and _exit functions
3. Show how the current signal mask of a signal can be changed?
4. State the purpose of SO_REUSEADDR and SO_REUSEPORT Socket options.
5. List out the information maintained by Zombie State.
6. Show how TCP maintains queue for listening socket.
7. How TCP_NODELAY option is used while sending small packets?
8. State few functions and uses of a raw socket.
9. How, when and why a client that wants to access a site in remote server would accesses the DNS?
10. How a client running on IPV4 configured host communicate with a server in IPV6 host?
11. Write a program to find the host byte order.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

12. State the conditions that generate a signal.
13. Explain Raw Socket Creation.
14. Explain the characteristics of Process Groups and Sessions.
15. Write notes on Signal Sets.
16. Write notes on Message Queues.
17. Explain Shared memory.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

18. Explain get host by name, get host by name2 with resolver option and the structure these two points by their return value.
19. Explain the various TCP Socket options in detail.
20. Write a Concurrent server program which uses TCP and show the status of Client and Server before call to fork, after fork and after socket closing by parent and child.
21. Explain the various UDP server side System Calls and getsocket , setsocket functions in detail.

6B20BCA - E06

DIGITAL IMAGE PROCESSING

Hours per Week : Theory - 4 **Credits : 3**

Module I

Images – DIP components – Problems and Applications – motivation and perceptive – Operations – Imaging – electronic camera – Human Eye – 3D imaging – Depth from triangulation , time-of-flight, interferometery, shading, tomography, Sampling – quantization, Colour Image representation, Volumetric data.

Module II

Images in Java – java2D API – java advanced imaging – image manipulation – storage – reading and writing images – display – printing – pixel processing – gray level and colour enhancement – mapping – image histogram – Histogram equalization – Colour processing.

Module II

Neighbourhood operations – convolutions and correlation – Linear and rank filtering – Edge detection – Hybrid adaptive fileters – frequency domain – spatial frequency – fourier theory – DFT – investigating spectra – image filtering – deconvolution.

Module IV

Geomteric operation – simple techniques – Affine transformations – Algorithm – interpolation schemes – Wrapping and morphing – segmentation – thresholding – Contextual techniques.

Module V

Morphological image processing – Basic concepts – operations – Morphological filtering – Morphological algorithms – Gray scale morphology – image compression. Redundancy – Performance characterization – Lossy and lossless compression techniques – compression of moving images.

Text book:

Digital image Processing : A practical introduction using Java ; Nick Efford; Pearson Edn.

Reference:

1.Digital Image Processing; Gonzalez and Woods; Pearson Edn.

2. Digital image Processing; B. Jahne; Springer international Edn.

Model Question Paper
6B20BCA - E06 DIGITAL IMAGE PROCESSING

Time: 3 Hrs **Max. Marks: 40**

SECTION A

1. One word answer **(8 x 0.5 = 4 marks)**

a. The non separable exponential function is ----------
b. The fourier transformation for one dimensional sequence is --------
c. ---------- is an area that also deals with improving the appearance of an image.
d. Digitizing the amplitude values is called ------
e. The method used to generate a processed image that has a specified histogram is called ---------
f. The way of representing a contour by a set of boundary points or by a single boundary point and a set of directional is referred to as-------
g. ---------- is the most frequently used transformation for image compression.
h. The process by which a training set is used to obtain decision function is called ------

SECTION B

Write short notes on ANY SEVEN of the following questions **(7 x 2 = 14 marks)**

2 What is RGB colour model
3 What is colour image compression
4 Explain coding redundancy
5 Explain dilation
6 Describe Intensity slicing
7 Explain erosion
8 Describe band pass filters
9 Explain colour slicing
10 Write notes on wrapping
11 Write notes on colour image smoothing

SECTION C

Answer ANY FOUR of the following questions **(4 x 3 = 12 marks)**

12 Explain pixel processing
13 Describe edge detection
14 Describe wrapping and morphing
15 Explain image filtering
16 What is tomoggraphy
17 What is histogram processing

SECTION D

Write an essay on ANY TWO of the following questions **(2 x 5 = 10 marks)**

18 Explain spatial transformations
19 Describe spatial frequency
20 Write notes on lossy and lossless compression techniques
21 Explain multi resolution expansion

Sd/-

Shijo M Joseph

Chairman BOS Computer Science (UG)