

KANNUR UNIVERSITY



COURSE STRUCTURE AND SYLLABUS

For

UNDERGRADUATE PROGRAMME

In

COMPUTER SCIENCE

CORE, COMPLEMENTARY

And

OPEN COURSES

Under

CHOICE BASED CREDIT AND SEMESTER SYSTEM

w. e. f. 2014 ADMISSION

**General Guidelines, Curricula, Syllabus and Scheme of examinations
for B.Sc (Computer Science) Programme w.e.f 2014 admission
onwards.**

B.Sc. Computer Science, an undergraduate programme under the Faculty of Technology of Kannur University, consists of Computer Science as core subject with two complimentary subjects. 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, Complimentary Course, Core Course and Open Course. The break-up of the courses is as follows; Detailed course structure is given in table 1.

Common courses (English + Additional language)	0 6
Common courses (General)	0 4
Complimentary I	0 5
Complimentary II	0 5
Core	1 9
Open Course	0 1
Total	4 0

COURSE STRUCTURE

B.Sc Computer Science[Core]

Semester –I

No.	Course Name	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	Core course-1 Introduction to Computers & Programming Languages	1	2	3	50
5	Complementary I (Mathematics)	4		3	50
6	Complementary II	4		3	50
	Total	23	2	20	300

Semester –II

No.	Course Name	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	Core course- 2 Advanced Programming in C	1		2	50
5	Core course -3 Lab-1 Advanced C Programming		2	1	25
6	Complementary I- (Mathematics-II)	4		3	50
7	Complementary II-	4		3	50
	Total	23	2	20	325

Semester –III

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	General course-1 Programming with C++	3	2	4	50
2	General course-2 Digital Electronics	4		4	50
3	Core course-4 Data Structure	3	3	4	50
4	Complementary I (Mathematics-III)	5		3	50
5	Complementary II	5		3	50
	Total	20	5	18	250

Semester –IV

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	General course-3 Database Management System	3		4	50
2	General course-4 Operating System	4		4	50
3	Core course-5 C# and.NET Programming	3		4	50
4	Core course -6 lab –II (Programming with C++ & Data Structure)		2	1	25
5	Core course-7 Lab-II (.NET Programming & DBMS)		3	2	25
6	Complementary I (Mathematics-IV)	5		3	50
7	Complementary II	5		3	50
	Total	20	05	21	300

Semester –V

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course-8 Software Engineering	3		4	50
2	Core course-9 Web Technology	2	3	3	50
3	Core course-10 Java Programming	3	3	4	50
4	Core course -11 Linux Administration	3	2	3	50
5	Core course -12 Elective-I	4		4	50
6	Open Course	2		2	25
	Total	17	08	20	275

Semester –VI

No.	Course Name	Hours/Week		Credit	Marks
		Theory	Practical		
1	Core course-13 System Software	4		3	50
2	Core course-14 Data Communication & Networks	4		3	50
3	Core course-15 Computer Organization	3		3	50
4	Core course -16 Elective-II	4		3	50
5	Core course -17 Lab IV – Java & Shell Programming		3	2	25
6	Core course-18 Lab IV Web Technology		2	2	25
7	Core course -19 Lab V- Project	2	3	5	100
	Total	17	08	21	350

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 BSc. Computer Science 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 (two each in third and fourth semesters). The syllabi of general courses include the topics related to Computer Science.

Complementary Course:

Means a course which is generally related to the core course (traditionally referred to as subsidiary paper). There are two complimentary subjects for BSc. Computer Science programme. The total number of courses offered in each subjects shall be FIVE. 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 Science consists of 13 theory papers, 5 practical papers and 1 project work. The semester wise list of Core and General Courses is given in Table 2.

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. 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. The list of open courses in Computer Science is given in Table 3. for the purpose of open course B.Sc Computer Science and BCA should be considered as a single department.

Table 2. Scheme of Core and General Courses

No	Se m	Course Code	Course Name	Hours/Week		Credit	Total Crd/s
				Theory	Prati cal		
1	1	1B01CSC	Introduction to Computers & Programming Languages	1	2	3	3
2	2	2B02CSC	Advanced Programming in C	1		2	3
3	2	2B03CSC	Lab-I Advanced C Programming		2	1	
4	3	3A11CSC	Programming with C++	3	2	4	12
5	3	3A12CSC	Digital Electronics	4		4	
6	3	3B04CSC	Data Structure	3	3	4	
7	4	4A13CSC	Database Management System	3		4	15
8	4	4A14CSC	Operating System	4		4	
9	4	4B05CSC	C# and .NET Programming	3		4	
10	4	4B06CSC	Lab-II (Programming with C++ & Data Structure)		2	1	
11	4	4B07CSC	Lab-III (.NET Programming & DBMS)		3	2	
12	5	5B08CSC	Software Engineering	3		4	20
13	5	5B09CSC	Web Technology	2	3	3	
14	5	5B10CSC	Java Programming	3	3	4	
15	5	5B11CSC	Linux Administration	3	2	3	
16	5	5B12CSC	Elective-I	4		4	
17	5	5D---CSC	Open Course	2		2	
18	6	6B13CSC	System Software	4		3	21
19	6	6B14CSC	Data Communication & Networks	4		3	
20	6	6B15CSC	Computer Organization	3		3	
21	6	6B16CSC	Elective -II	4		3	
22	6	6B17CSC	Lab IV- Java & Shell Programming		3	2	
23	6	6B18CSC	Lab V Web Technology		2	2	
24	6	6B19CSC	Project		5	5	

Elective -I							
N o	Se m	Course Code	Course Name	Hours/Week		Credit	Marks
				Theor y	Practi cal		
1	5	5B12CSC - E01	Algorithm Analysis and Design	4	--	4	50
2	5	5B12CSC -E02	Computer Graphics	4	--	4	50
3	5	5B12CSC -E03	Data Mining	4	--	4	50
Elective -II							
1	6	6B16CSC - E04	Compiler Design	4	--	3	50
2	6	6B16CSC - E05	Data Compression	4	--	3	50
3	6	6B16CSC - E06	Information Security	4	--	3	50

Table 3. Scheme of OPEN COURSES for 5th Semester

Sl. No	Se m	Course Code	Name of the Course	Hours/ Week	Credit	Marks
1	5	5D01CSC	Programming with C	2	2	25
2	5	5D02CSC	Web Technology	2	2	25
3	5	5D03CSC	Data Base Management System	2	2	25

Scheme of Complementary Courses

No	Sem	Course Code	Course Name	Theory	Pra	Credit	Total credit/s	Marks
1	1	1C01CSC	Fundamentals of Computers & Programming languages	2	2	2	2	40
2	2	2C02CSC	Programming in C	2	2	2	2	40
3	3	3C03CSC	Data Base Management System	3	2	3	3	40
4	4	4C04CSC	Visual Programming	3		3	5	40
5	4	4C05CSC	Lab-I (C Programming, DBMS & Visual Basic)		2	2		40
TOTAL						12		200

CREDITS

Each course shall have certain credits. For passing the BSc. Computer Science 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. The distribution of credits for various courses is given in Table 3.

CREDIT DISTRIBUTION (LRP-COMPUTER SCIENCE)

SUBJECT	SEM	COMMON		GENERAL	CORE	COMPLEMENTARY		OPEN	TOTAL
		ENGLISH	ADDITIONAL			Maths	Stat		
COMPUTER SCIENCE	I	4+3	4	----	3	3	3	----	20
	II	4+3	4	----	2+1	3	3	----	20
	III	----	----	4+4	4	3	3	----	18
	IV	----	----	4+4	4+1+2	3	3	----	21
	V	----	----	----	4+4+4+4+2	----	----	2	20
	VI	----	----	----	3+3+3+3+2+2+5	----	----	----	21
TOTAL		14	8	16	56	12	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. The format of the title page of assignment /seminar report is given in Appendix I

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of **FIVE** 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 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 **THREE**. The format of the title page of Dissertation is given in Appendix II

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

- a) Internal Assessment (IA)
- b) 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 Table 4.

Table 4. Scheme of mark distribution of BSc. Computer Science 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	I (Mathematics)	4	10	40	50	200
	II (Statistics (without Practical)	4	10	40	50	200
	/Electronics/Physics)	5	8	32	40	200
Core	Theory	13	10	40	50	650
	Practical	5	05	20	25	125
	Project	-	20	80	100	100
Open course		1	5	20	25	25
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 complementary 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
01	A bunch of 8 one word answer questions	0.5	0.5 X 8=4	04
02	Short answer	2	07/10	14
03	Short Essay /Programs	3	04/06	12
04	Essay Type	5	02/04	10

2. Complementary Courses

- Maximum Marks for each course - **32 Marks**
- Duration of examination - **3 Hrs.**

Sl.No	Type of Question	Marks	Number of Questions to be answered / total number of questions	Max. Marks
01	A bunch of 8 one word answer questions	0.5	0.5 X 6=3	03
02	Short answer	2	05/08	10
03	Short Essay /Programs	3	03/05	09
04	Essay Type	5	02/04	10

3. 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
01	A bunch of 8 one word answer questions	0.5	0.5 X 8=4	04
02	Short answer	2	03/05	06
03	Short Essay /Programs	3	02/04	06
04	Essay Type	4	01/02	04

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 code	3	3
Error free Execution	2	2
Perfect Output	2	2
Modification	1	1
Viva-voce	2	2
Total	10	10

Project Evaluation

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

- a) Internal Assessment (supervising teachers will assess the project and award internal Marks)
- b) 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	04	Writing synopsis/Abstract	12.5	10
			Content of the Report	12.5	10
Relevance of topic System study / Design of tables	20	04	Quality of project work/ Use of software/ tools	12.5	10
			Perfection of the work done (Designs of tables/ Input & Output forms)	25	20
Project Report	30	06	Live demo	12.5	10
Presentation & Viva-voce	30	06	Viva-Voce	25	20
Total	100	20	Total	100	80

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.

1B01CSC

Introduction to Computers & Programming Languages

Contact Hours / Week: Theory: 1 & Lab 2 **Credits: 3**

Aim

To introduce basic concepts of computer system and study about algorithms, flowchart and problem solving through logical thinking.

Objectives

1. *To know the working principle of a computer.*
2. *To analyze the problem and write algorithm and flowchart.*
3. *To impart skills to enable students to use digital knowledge resources in learning.*

Module 1

Introduction to Computers: Characteristics, Evolution, Generation, Classification, CPU- ALU, Registers, Control Unit, System Bus, Main Memory Unit, Cache Memory. Types of RAM & ROM. Secondary storage devices: magnetic, optical and magneto-optical storage devices. Mass storage devices. Data Representation in Computers, Input and Output devices.

Module II

Computer Programming: Introduction, Developing a program, program development cycle, Algorithm, Flowchart, program control structures, programming paradigms. Characteristics of a good program. Programming languages: Types and Generations of programming languages. Assembler, Compiler and Interpreter. Program : structure, top-down design, source code, object code, executable file, file extensions.

Module III

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, Operators. Precedence and order of evaluation. Type conversion in expression. Common programming errors, Program testing and debugging

Module IV

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 V

Knowledge skills for higher education: Data, information and knowledge, Internet access methods –Dial-up, DSL, Cable, ISDN, Wi-Fi. Basic concepts of IPR, copyrights and patents, plagiarism, software piracy, cyber ethics, cybercrime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, information overload, health issues- guide lines for proper usage of computers, internet and mobile phones.

Text Book

1. Computer Fundamentals and Programming in C, Anita Goel, Ajay Mittal, Pearson Education.
2. Introduction to information Technology, ITL Education solutions, Pearson Education
3. ANSI C, E. Balagurusamy, McGraw-Hill Publication
4. V. Rajaraman, Introduction to Information Technology, Prentice Hall
5. Technology in Action, Pearson

References

1. Programming in C, Ashok N Kamthane, Perason Education.
2. Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas
3. Barbara Wilson, Information Technology: The Basics, Thomson Learning
4. Ramesh Bangia, Learning Computer Fundamentals, Khanna Book Publishers
5. Computer Basics and c Programming, V. Rajaraman, PHI, 2008
6. Let us C, Yeshvanth Kanethkar, 3rd Edn, BPB,

Model Question Paper
1B01CSC Introduction to Computers & Programming Languages

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. The sequence of instructions that instruct the computer to carry out a specific task is called-----
 - f. Compiler and Interpreter are also called -----
 - g. What is the minimum number of temporary variables required to swap the content of two variables.
 - h. The arguments following the first argument in a scanf function should denote-----

SECTION B

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

- 2. Compare interpreter and compiler.
- 3. What is a system bus?
- 4. Define an algorithm.
- 5. How will you read and write a character in C.
- 6. What are the new threats in the IT industry.
- 7. What is compiler?
- 8. Explain ISDN.
- 9. What are the rules of variable naming convention in C.
- 10. Define conditional operator.
- 11. What are C Tokens.

SECTION C

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

12. Explain the features of a good programming language
13. Discuss three basic program control structures with suitable examples.
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. Explain about the data types in C.

SECTION D

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

18. Explain about the looping statements in C.
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.

2B02CSC

Advanced Programming in C

Contact Hours / Week: Theory: 01 Credit: 2

Aim

To introduce procedure oriented concept and to impart skill in advanced programming.

Objectives

1. *To develop c programs using advanced constructs.*
2. *To design algorithm for solving a programming problems.*
3. *Develop skill in programming.*

Module I

Arrays: Introduction to Arrays One Dimensional Array Strings Two Dimensional, Array Multi- dimensional Array. Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strcmp. Two dimensional arrays of strings

Module II

Functions: Introduction to Functions, Function Declaration and Prototypes, Storage Classes Recursion in Function.

Module III

Pointers: Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer, Pointer Expressions. Pointers and One Dimensional Arrays, Arrays of Pointers, Pointer to Pointers, Pointers and Functions.

Module IV

Structures and Unions: Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Passing Structures to Functions. Union–Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable, Use of User Defined Type Declarations. Dynamic Memory Allocation.

Module V

File Handling in C: What is a File. Defining and Opening a File, Functions for Random Access to Files. Types of C preprocessor directives, Macros- comparison with functions, Command line arguments.

Text Books:

- 1) Programming with ANSI and Turbo C, Ashok N. Kamthane, 1st edn, Pearson Education.
- 2) Balagurusamy, E: "Programming in ANSI C" 2nd Edition. Tata McGraw-Hill

Reference:

- 1) Deitel, H M and Deitel P J: "C How to Program", 2nd Edition. Prentice-Hall.
- 2) Kanetkar, Yashavant: "Let Us C", 4th Edition. BPB Publications.
- 3) Gottfried, Byron S: "Programming with C", 1996. Tata McGraw-Hill

Model Question Paper
2B02CSC Advanced Programming in C

Time: 3 Hour**Max Marks 40****SECTION A**

1. **One word answer** **(8 x 0.5 = 4 marks)**
 - a. Maximum number of elements in a [5] [13] is
 - b. 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 offunction.
 - 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. How can we initialize an array?
3. Which function is used to deallocate memory.
4. Define Macro.
5. What is the difference between structure and union?
6. What is a library function?
7. Give an example to illustrate the concept of structures.
8. What is function prototype? Give one example.
9. What are formal parameters in functions?
10. Give the meaning of declaration: int *ptr;
11. Give syntax for opening a file.

SECTION C

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

12. Write a C program to access array elements using Pointers.
13. write note on dynamic memory allocation.
14. Explain storage classes in C.
15. Explain recursive function with an example.
16. write note on preprocessor directives in C language.
17. what do you mean by command line arguments.

SECTION D

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

18. Explain briefly the term 'user defined functions' and its categories.
19. Explain string-handling functions in detail
20. Define a structure data type called Employ containing three fields : name ,age and designation . Develop a program that would assign values to the individual members and display it.
21. Write a program to create a file and store some records in it. Display the contents of the same.

2B03CSC Lab-I

Advanced C Programming

No. Practical Hours / Week: 02 Credit:1

Guidelines

- *Follow standard coding method*
- *Write Algorithm and draw flow chart neatly*
- *The output of the program should be neatly formatted*
- *Practice all the programs in the lab*

Sample Program list

- 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.

QUESTION PAPER PATTERN

Two questions will be selected by the examiners. Students have to write and execute both programs.

3A11CSC

Programming with C++

No. of Hours / Week: Theory: 3 & Lab 2 Credit: 4

Aim

To introduce Object oriented concepts and to impart skill in object oriented programming using C++.

Objectives

- 1. Introduce concepts such as classes and objects.*
- 2. Define and use classes and objects using C++ language.*
- 3. Introduce OOPs concepts such as inheritance and polymorphism and their implementation using C++.*
- 4. Skill in developing OOPs Program for a given problem.*

Module I

Principles of object oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications. Introduction to C++, Structure of C++ program; how to create and execute a C++ program. declaration and dynamic initialization of variables; reference variables. Operators; Scope resolution; memory dereferencing and memory management operators; manipulators; operator overloading; operator precedence; Control structures.

Module II

Functions: main; prototyping; call by reference; inline function; default and const arguments; function overloading; friend 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;.

Module III

Constructors and destructors : - Constructors; Parameterized constructors; multiple constructors in a class; constructors with default arguments; 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.

Module IV

Inheritance – defining derived classes; single inheritance; making a private member inheritance; multilevel inheritance; multiple inheritance; hierarchical inheritance; hybrid inheritance; virtual base classes; abstract 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. Files – 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:

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

Model Question Paper **3A11CSC Programming with 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 hasconstructor 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.

3A12CSC

Digital Electronics

No. of Contact Hours / Week: Theory: 4 Credit: 4

Aim

To impart basic knowledge in digital logic and circuits

Objectives

- 1. To introduce student to basic concepts of digital logic*
- 2. To introduce students to the design of basic logic circuits*
- 3. To introduce students to some commonly used combinational and sequential circuits*

Module I

Digital Concepts: Introduction, Decimal numbers, Binary numbers, Decimal to binary conversions, Binary arithmetic, 1's and 2's complements of Binary numbers, Signed numbers, Arithmetic operations. Hexadecimal numbers, Octal numbers, Digital codes, Binary coded decimal (BCD).

Module II

Logic Gates: Positive and negative logic, NOT gate, AND gate, OR gate, NAND gate, NOR gate, EX-OR and EX-NOR gates. Boolean Algebra: Boolean operations, logic expressions, rules and laws of Boolean algebra, DeMorgan's theorems, Boolean analysis of logic circuits, Simplification using Boolean algebra, Standard forms, SOP and POS Expressions, Karnaugh map techniques SOP & POS (up to 4 variables).

Module III

Combinational Logic Circuits: Implementation, Universal property of NAND and NOR gates, Half adder, Full adder, Parallel binary adder, Comparators, Decoders, BCD to 7-segment decoder, Encoders, Code converters, Multiplexers and Demultiplexers, Parity generators and Checkers .

Module IV

Sequential Logic Circuits: SR Latches, Gated S-R latch, gated D latch, Flip-Flops: Edge triggered flip flops, Master Slave flip flops, Applications Counters: Asynchronous counters, Decade Asynchronous counters, Synchronous counters, synchronous Decade counters, up/down synchronous counter, Applications.

Module V

Shift register: serial in - serial out, serial in - parallel out, parallel in - serial out, parallel in-parallel out configurations. Ring counter, Johnson's counter,

Text Book:

1. Digital Fundamentals-Thomas L. Floyd & RP Jain, 10th Edition, Pearson Edition

References:

1. Digital logic and computer design – Moris Mano- PHL
2. Digital Principles and Applications- A. P. Malvino, McGraw Hill Int Editions (Fourth Edition)
3. Modern Digital Electronics- R. P. Jain, Tata McGraw Hill Pub. Company(Third Edition)
4. Digital Computer Fundamentals- Bartee T.

Model Question Paper
3A12CSC Digital Electronics

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 of the following gate has Universal property OR b. AND c. NAND d.XOR
- 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.

3B04CSC

Data Structure

No. of Contact Hours / Week: Theory: 3 & Lab 3 Credit: 4

Aim:

To familiarize the students with the methodology of computer science.

Objectives:

- 1. To introduce the concept of analysis of algorithms and ability to compare algorithms based on time and space complexity.*
- 2. To familiarize with selected linear and nonlinear data structures.*
- 3. To enhance skill in programming.*
- 4. To inculcate systematic approach to programming.*
- 5. Develop ability to select appropriate data structure for a given problem.*

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. 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. Queue : 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. 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).

Text Book:

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

Reference Books:

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

Model Question Paper 3B04CSC Data Structure

Time: 3 Hrs

Max. Marks: 40

SECTION A

1. One word answer

(8 x 0.5 = 4 marks)

- a . A 2-D array is also called
- b A data structure is said to beif its elements form a sequence.
- c. Ais nothing but an array of characters.
- d An array of pointers to strings storesof the strings
- e The '\0' 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)

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

SECTION C

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

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

SECTION D

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

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

4A13CSC

Database Management System

Contact Hours/Week: Theory 3 Credit: 4

Aim

To introduce basic concepts of data bases, and related techniques and tools

Objectives:

1. *Introduce the fundamentals of Data Base Management System.*
2. *Skill in designing database.*
3. *Familiarization of different DBMS models.*
4. *Skill in writing queries using MySQL.*

Module I

Introduction–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.

Module IV

Developing queries and sub queries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences.

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.
2. Introduction to data base systems ITL Education Solutions Limited.

Model Question Paper

3A13CSC – 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

4A14CSC

Operating System

Contact Hours /Week : Theory: 4 Credit : 4

Aim

To acquire the fundamental knowledge of the operating system architecture and components and to know the various operations performed by the operating system.

Objectives:

1. Familiarize with basics of design of operating systems
2. Introduce basic working process of operating systems.
3. To understand the importance process and scheduling.
4. To understand the issues in I/O devices synchronization and memory management

Module I

Introduction - Batch Processing System – Multi programming system - Time Sharing System – Real Time System. (Text book 2). Operating system structures: System Components-Process management, Main memory management, File management, I/O system management, Secondary storage management, (Text Book 1).

Module II

Processes : Process Concept – The Process , Process State , Process Control Block - Process Scheduling – Schedulers , Context Switch - CPU Scheduling: Basic Concepts –CPU scheduler , Pre-emptive scheduling, Dispatcher- Scheduling criteria – Scheduling algorithms –FCFS, SJFS , Priority Scheduling, Round Robin Scheduling (Text Book 1).

Module III

Dead locks: Characterization – necessary conditions – Resource allocation graph – Methods for handling deadlock - Deadlock prevention – mutual exclusion, hold and wait, no preemption, circular wait – Deadlock avoidance – safe state, Resource allocation graph, Banker's algorithm, Safety algorithm, Resource request algorithm – Deadlock detection –single instance of each resource type, several instances of a resource type - recovery from dead lock – process termination, resource preemption (Text book 1).

Module IV

Memory management [basic concepts only]: Single contiguous Allocation – Partitioned allocation – Relocatable partitioned – Paging – Demand paging – Segmentation – Segmentation and demand paging – Other schemes (Text book 3).

Module V

Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF Scheduling, SCAN Scheduling-SCAN Scheduling, LOOK Scheduling - Selection of a Disk Scheduling Algorithm (Text book 1).

Text Book

1. Silberschatz & Galvin – Operating System Concepts – Sixth edition – WSE publications
2. Dhamdhere, “Systems Programming and Operating Systems”, 2nd Revised Edn, TMH
3. Stuart E Madnick and John J Donovan, “Operating Systems”, Tata McGraw-Hill, 2005

Reference

- 1 Yeshavant . P. Kanetkar – “Unix Shell Programming” – BPB Publications
- 2 Stallings “Operating System Internals and design Principles” Pearson Pub
- 3 Nutt Chaki ,Neogy “ Operating Systems“ Pearson Pub

Model Question Paper
4A14CSC Operating System

Time: 3 Hrs

Max. Marks: 40

SECTION A

1. **One word answer** **(8 x 0.5 = 4 marks)**
 - a. In system a series of jobs are executed 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 The number of processes completed per unit time is known as _____.
 - g. _____ is the memory management scheme that support user view of memory.
 - h The time taken to move the disk arm to the desired cylinder is called

SECTION B

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

- 2 What is real time system?
- 3 What is dispatcher?
- 4 List two advantages of Multiprogramming?
- 5 What is a process?
- 6 When do you say a process is in safe state?
- 7 Define operating system?
- 8 Write note on context switch.
- 9 Define deadlock.
- 10 What is swapping?
- 11 Write note on page fault?

SECTION C

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

- 12 What do you mean by internal fragmentation?
- 13 Write a note on various process states.
- 14 What are the necessary conditions for deadlock.
- 15 Explain the term demand paging.
- 16 Write a note on PCB.
- 17 Explain First-in-First-out Page Removal algorithm with suitable example.
- 18 What is resource allocation graph and explain with an example?

SECTION D

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

- 19 Discuss in detail three process scheduling algorithms.
- 20 Explain methods for handling dead lock.
- 21 Explain any four disk scheduling algorithms.

4B05CSC

C# and .NET Programming

Contact Hours/Week : Theory 3 Credit : 4

Aim

To expose students to technology of .NET programming.

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

4B05CSC C# and .NET Programming

Time: 3 Hours

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

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

4B06CSC Lab-II

Programming with C++ & Data Structure

Practical Hours / Week: 2 Credit: 1

Guidelines

- Follow standard coding method
- The output of the program should be neatly formatted
- Practice all the programs in the lab
- Practical recode consist any 15 programs from part A and B

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

Sample Program list

Part A(C++)

1. Programme for class definitions and usage involving variety of constructors and destructors
2. Programs involving various kinds of inheritances,
3. Programs involving operator overloading and type conversions
4. Programs involving virtual base classes, friend functions
5. Programme to demonstrate early and late binding
6. Programme to allocate memory dynamically
7. Programme involving class and function templates
8. Programs to demonstrate (i) string processing (ii) file streams (iii) a variety of selected library functions
9. Programme for exception handling.
10. Programme for various matrix operations.

Part B (DS)

Write C++ programs for the following:

1. Queue operations.
2. Stack operation.
3. Add two polynomials
4. Insertion sort.
5. Binary and linear search.
6. Evaluation of postfix.
7. Quick sort
8. Singly linked list operations: add / delete / print / count.
9. Circular queue.
10. Tree traversal.
11. Merge two sorted linked lists.
12. Linked stack to reverse a string.
13. Singly linked list operations: search list, merge two lists.
14. Doubly linked list: add / delete nodes.
15. Linked stack to reverse a string.

QUESTION PAPER PATTERN

One question will be selected by the examiners from each part. Students have to write and execute both programs.

4B07 CSC Lab-III

.NET Programming & DBMS

Practical Hours / Week:3 Credit: 2

Guidelines

- *Follow standard coding method*
- *The output of the program should be neatly formatted*
- *Practice all the programs in the lab*
- *Include any ten programs from part A and B in practical recode*

Note *The lab consist of two sections: Programming in .NET and B: Data Base Management System. Equal weightage will be given for both sections. For internal assessment, each part may be evaluated independently and final CA grade shall obtained by combining them. End semester examination question shall carry questions from both sections*

Sample Program List

Part A (.NET)

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

Part B (Data Base Management System)

1. PostgreSQL
 - a. Introduction
 - b. Logging on to PostgreSQL
 - c. Creating Database
 - d. Accessing a Database
2. Data Definition Language (DDL)
 - a. Create, Drop Alter Keywords b. Tables c. Column d. Views

3. Integrity Constraints
 - a. Types of Constraints
 - b. Referential Integrity
 - c. Defining Constraints
4. Data Manipulation Language (DML)
 - a. Insert b. Update c. Delete
5. Data Query Language
 - a. Selecting Columns
 - b. Duplicate Information (DISTINCT)
 - c. Sorting Information
 - d. Filtering Data Using Where
 - e. Group By and Having Functions
 - f. Aggregate Functions.
6. Retrieving Data from Multiple Tables
 - a. Joining Tables (Equi-Joins, Non-Equi-Joins, Self Join)
 - b. Aliases for Table Names
7. Sub-Queries
 - a. Basic Sub queries
 - b. Multiple Column Sub queries
 - c. Sub queries with Having
8. SQL Functions
 - a. The Concatenation Operator
 - b. Column Aliases
 - c. String Functions
 - d. Arithmetic Functions
 - e. Date Functions
9. Sequence
10. Functions and Triggers.

QUESTION PAPER PATTERN

One question will be selected by the examiners from each part. Students have to write and execute both programs.

5B08CSC

Software Engineering

Contact Hours/Week: 3 Credit: 4

Aim:

To introduce the basic concepts of software engineering.

Objectives:

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

Module I

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 II

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

Module III

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function oriented design.

Module IV

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

Module V

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, cause effect graphing techniques; structural testing, path testing, cyclomatic complexity, mutation 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. Fundamentals of Software Engineering Rajib Mall PHI Publication
2. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley.
3. Software Engineering A practitioners approach (Sixth Edition), Roger S Pressman-Mc Graw Hill.
4. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli – Pearson Education.

Model Question Paper 5B08CSC Software Engineering

Time: 3 Hours

Maximum Mark: 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.

5B09CSC

Web Technology

Contact Hours / Week: Theory:2 Practical: 3 Credit: 3

Aim

To introduce various tools and languages required for technical and creative design of state-of-the-art web sites.

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 I

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 II

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd,submit,radio,check,method,action.Frame-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes.

Module III

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 IV

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

ModuleV

Objects, Web Techniques, HTTP Basics, Databases, Using PHP to access database, relational databases and SQL, Client-server model.

Text Books:

1. HTML-Definitive Guide O'reilley 5th edn
2. Javascript-Definitive Guide O'reilley 6th edn
3. Programming in PHP O'reilley

Reference:

1. Complete reference in PHP-Steven Hozner
2. Beginning PHP5 (Wrox Programmer)
3. Complete reference HTML-Tata McGraw Hill
4. Programming the World Wide Web, Robert W Sebesta, Pearson Publications
5. Web enabled commercial application development using HTML,DHTML,JavaScript, Perl CGI – Ivan Bayross, BPB publications

Model Question Paper

5B09CSC - Web Technology

Time: 3 Hrs

Max. Marks: 40

SECTION A

1. **One word Answer** **(8 x 0.5 = 4 marks)**
 - a. HTML files are sent and received using -----protocol.
 - b. Which tag is used for labeling?
 - c. Action is an attribute oftag.
 - d. The tag used to make hyper link is
 - e. Which tag is used to embed java script 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 on 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.

5B10CSC

Java Programming

Contact Hours/Week : Theory: 3 Practical: 3 Credit: 4

Aim

To expose the students to the basic features of Java programming language

Objectives:

- 1. To review Object Oriented Programming concepts.*
- 2. To learn concept of Object Oriented Programming using Java*
- 3. To develop skill in java programming.*

Module I

Introduction to Java programming: Java history; features of java; Java Applets and Application, Byte Code; Over view of Java, Java Language fundamentals: Building blocks; Data types; variables And Arrays. Operators- Arithmetic, Bitwise, Relational, Boolean Logical, Assignment; Control statements;

Module II

Introducing Classes: Class fundamentals; Introducing methods; Constructors; This keyword; Garbage collection; A closer look at methods and classes; Inheritance basics; Using Super; When Constructors are called; Method Overriding; Dynamic method dispatch; Abstract classes; Uses of final keyword. Packages: Introduction- Creating a Package- CLASSPATH; Accessing a package-simple program using package; Interfaces: definition- extending interface- implementing interface- simple programs using interface.

Module III

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); multithreading: introduction- Creating threads; thread life cycle; thread Priorities, Synchronization.

Module IV

Applets : Fundamentals [page-328]; Applet skeleton [pg-632], Applet differ from Application- Building Applet code; Working with Applets; The HTML APPLET tag; Sample programs using Applet.

Module V

The Abstract Window Toolkit:- AWT classes; AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars), Delegation event model [Pg-654]. JDBC/ODBC Bridge Driver; Working with JDBC using JDBC/ODBC driver; Simple Program using database.

Text book :

1. Java 2 The complete Reference, Schildt, McGraw Hill

Reference:

1. Programming with java: A primer, 3rd Edn; E. Balaguruswami; McGraw Hill
2. Object Oriented Programming through JAVA, Radha Krishna, University Press.
3. Programming with JAVA a primer, E Balagurusamy, 4th Edition Tata McGraw-Hill.

Model Question Paper 5B10CSC 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 Database MetaData 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.

5B11CSC

Linux Administration

Contact Hours / Week: Theory: 3 Practical: 2 Credit: 3

Aim

To familiarize Linux working environment and system administration .

Objectives

1. *Introduce Linux working environment*
2. *Understand how install and configure Linux*
3. *Learn how to write shell scripts*
4. *Learn the architecture of Linux kernel and how resources are managed in Linux*

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-current working directory-referring home directory-creating 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,/etc/lilo.conf, GRUB, /etc/grub.conf-runlevelsGUI,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 file System 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 Maintenance: tmpwatch-logrotate-basic system backup and restore operation-Basic shell configuration for bourne and bash shell : /etc/profile,~/.bashrc,~/.bash_profile. Linux Installation :Partitioning, MBR, SWAP, filesystem managing-different packages, rpm-installation of packages-starting and stopping different services.

Text Book

Unix Shell Programming, Yeshwanth kanethkar

Reference:

1. Unix in a nutshell,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 5B11CSC Linux Administration

Time: 3 Hrs

Max. Marks: 40

SECTION A

1. One Word Answer

0 .5X8=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 stores system configuration files in Linux
- g. The GUI of Linux is termed as_____.
- h. _____command is used to switch one runlevel 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 compress a file in Linux?
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 run levels?. 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

6B13CSC

System Software

Contact Hours / Week: Theory: 4 Credit: 3

Aim

To introduce the fundamental concepts of system software

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 preprocessors.*
5. *Overview of various aspects of compilers.*

Module I

System software, Introduction to language processor, language processors, Fundamentals of language processing, Introduction to machine structure, Machine and assemble languages.

Module II

Assembler- Design of an assembler Elements of assembly language programming, Pass structure, Format of data structure

Module III

Loader and linkers: Functions of Loader and Linker, Programme relocation, Loading and linking schemes, Compile and Go, General loader scheme, Absolute loader, Subroutine linkage, direct linking . dynamic linking, overlay structure.

Module IV

Fundamentals of Language specification, Formal language grammar, Derivation Reduction and parse tree, Classification of Grammars, Ambiguity of grammatical specification, Scanner and scanning, Parsing

Module V

Compilers: introduction, passes of a compiler, Aspect of compilation, Compilation of expression, Compilation of control structures, intermediate representation, code optimization

Text Books:

System Software and Operating system –TMH - By D M Dhamdhare

References

System Programming –TMH- By John Donovan

System software and distributed Computing by ABBAS T P

Model Questions

6B13CSC System Software

Time: 3 Hrs

Max. Marks: 40

SECTION A

1. One Word Answer

0.5X8=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*2=14 Marks)

2. What is an assembler
3. What is an absolute loader
4. How grammars are classified
5. What is parsing
6. Define the term formal language
7. What is an over lay
8. What is meant by code optimization
9. What are the functions of loader
10. Describe compilers phases
11. Describe top down and bottom up parsing

SECTION – C

Answer ANY FOUR of the following questions

(4*3=12 Marks)

12. What is meant by ambiguity in grammar specification
13. Describe the design of absolute loader
14. Explain the compilation of an expression
15. Explain the code optimizing transformation
16. Explain the functions of Linker and Loader
17. How grammars are classified

SECTION- D

Answer ANY TWO of the following questions

(2*5=10 Marks)

18. Explain in details about Compiler and it phases
19. Explain the concept of code optimization in details
20. What is an assembler? Explain its design
21. Explain the compilation of control structure

6B14CSC

Data Communication & Networks

Contact Hours / Week: 4 Credit: 3

Aim

To introduce various components used in a data communication system

Objectives

1. *To understand state-of-the-art in network protocols, architectures and application.*
2. *To acquire knowledge about different computer networks.*
3. *To understand the use of layer architecture for networking systems.*

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.

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- character 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 Book

A S Tanenbaum . Computer Networks 3rd Edn Pearson Pub.

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, Easarakumar & Balasubramaian, Vikas pub.

Model Question Paper 6B14CSC Data Communication & Networks

Time: 3 Hours

Maximum Mark: 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 = 10 Marks)

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.

6B15CSC

Computer Organization

Contact Hours/Week : 3 Theory Credit: 3

Aim

To impart knowledge in the functional organization of a computer system.

Objectives

1. *To introduce the basic terminology of computer hardware.*
2. *To familiarize the functional units of a computer system.*
3. *To understand the basic operation of a computer system.*
4. *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 6B15CSC 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 of operation of control unit when go through 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.

6B17CSC Lab-IV

Java & Shell Programming

Practical Hours / Week: 3 Credit: 2

Guidelines

- Follow standard coding method
- The output of the program should be neatly formatted
- Practice all the programs in the lab
- Include any ten programs from part A and B in practical recode

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

Sample Program List

Part A Java)

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 static variables and methods.
11. Illustration of packages.
12. Implementation of multithreading by extending Thread class
13. Creation of applets and passing parameters to applets.
14. Demonstration of FileInput Stream and FileOutput Stream Classes
15. Create web page using HTML with frames.

Part B (Shell Programming)

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

QUESTION PAPER PATTERN

One question will be selected by the examiners from each part. Students have to write and execute both programs.

6B18CSC Lab-V

Web Technology

Practical Hours / Week:2 Credit: 2

Guidelines

- Follow standard coding method
- The output of the program should be neatly formatted
- 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.
Train name, starting place, destination, arrival and departure time and fare
5. Create an HTML page with images. Clicking on the images should lead to external documents.
6. Form Validation using Java Script
7. Create a web page for your college using frames, images and hyper links
8. Create an email registration form. Give necessary validations
9. Write a JavaScript code using arrays
10. Create a web page that illustrate the onMouseOver and onMouseOut event handlers
11. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation
12. Write a Javascript program to display the current time
13. Write a Javascript program to print the prime numbers within a range
14. Write a Javascript program to show the working of alert()
15. Write a JavaScript program to find the factorial of a number.
16. Form Processing using PHP
17. Form validation using PHP
18. Storing data in MYSQL using PHP

QUESTION PAPER PATTERN

One question will be selected by the examiners. Students have to write code and execute the program.

6B19CSC

Project

Theory 02 Lab Hours 03/ Week

Credit 5

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 B.Sc (Computer Science) 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.

a) Developing solution for real life problem

In this case a requirement for developing a computer-based solution already exists 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 exist 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 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 B.Sc 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 institute /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 institute /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 standaeized 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> BSc(CS) 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.

1. 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/ Kumunder our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of B.Sc Computer Science 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 titledis a bonafide record of the project work done by Sri/Kum.....under my supervision and guidance, at thedepartment of..... (Organization) towards partial fulfillment of the requirement for the award of the Degree of B.Sc (Computer Science) 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.

There shall be six 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 4 marks
- Relevance of topic System study / Design of table/Individual involvement, team work and adoption of industry work culture 20% or 4 marks
- Project report Quality of project documentation (Precision, stylistics etc)/Achievement of project deliverables 30% or 6 marks
- Viva Effective technical presentation of project work 30% or 6 marks

Based on the above 6 components internal mark (20)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 80 marks based on the following components given in the table below.

External (80% of Total)		
Components	% of Marks	Marks
Writing Synopsis/ Abstract	12.5	10
Content of the Report	12.5	10
Quality of project work/Use of software/ tools	12.5	10
Perfection of the work done (Designs of tables/ Input & Output forms)	25	20
Live demo	12.5	10
Viva-Voce	25	20
Total	100	80

ELECTIVE AND OPEN COURSE

5B12CSC - E01

Algorithm Analysis and Design

Contact Hours/Week: Theory :4 Credit: 4

Module I

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

Module II

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 III

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

Module IV

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

Module V

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.
2. The design and analysis of computer Algorithms Alfred V Aho John E Hopcroft Pearson Education

5B12CSC - E02

Computer Graphics

Contact Hours/ Week : Theory : 4 Credit : 4

Module I

Introduction, Overview of Graphics Systems, Display devices, Input devices, Hard-Copy devices, Graphics software.

Module II

Line Drawing Algorithms-DDA, Bresenham, Circle Generating Algorithm – Midpoint Algorithm, Area filling algorithms – Flood Fill and Boundary Fill algorithms.

Module III

Output primitives-Color and Grayscale levels, 2D Transformations-Translation, Rotation, Scaling, Reflection, Shear, Matrix Representation and Homogenous Coordinates, Composite Transformations.

Module IV

Two Dimensional viewing, Window-to-viewport Transformation, Clipping - Point Clipping, Line Clipping – Cohen Sutherland Algorithm, Polygon Clipping – Sutherland Hodgeman Algorithm, Text clipping.

Module V

3D object representations-Polygon surfaces, Polygon tables, Plane equations, Polygon Meshes, 3D transformations-Translation, Rotation, Scaling, Rotation about an arbitrary axis, Reflection, Shear, 3D viewing- Parallel Projection, Perspective Projection.

Text Book

1. Donald Hearn and M.Pauline Baker, “Computer Graphics-C Version”, Second Edition, Pearson Education, 2005.

References

1. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", 2nd edition in C, Pearson Education, 2005
2. Ranjan Parekh, "Principles of Multimedia", ,Tata McgrawHill,2006
3. D.P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI.
4. "Procedural elements of Computer Graphics", Rogers, Mc-Graw Hill.

5B12CSC – E03

Data Mining

Contact Hours / Week : Theory: 4 Credit : 4

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 mining.

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.

6B16CSC – E04

Compiler Design

Contact Hours /Week : 4 Credit : 3

Module I

Introduction Compilers, structure, lexical analysis, intermediate code generation, optimization, compiler writing tools, high level programming languages, definition, lexical and syntactic structure of a language.

Module II

Role of lexical analyzer, design of lexical analyzer, regular expressions, finite automata, implementation of a lexical analyzer.

Module III

Syntactic specification of programming languages, Context free grammars, derivations and parse trees, shift reduce parsing, operator precedence parsing, top down parsing. Predictive parsing.

Module IV

Automatic Construction LR Parsers, canonical collection of LR items, constructing SLR parsing tables, constructing canonical SLR parsing tables.

Module V

Symbol tables, contents of a symbol tables, data structure for symbol tables, representing scope information. Errors, lexical errors, syntactic errors, semantic errors.

Text Book

Alfred V Aho & Jeffrey D Ullman, “ Principles of Compiler Design”, Pearson Education

Reference

1. A.A.Puntambekar, “Principles of Compiler Design”, Technical Publications.
2. Compilers Principles and practice Parag H Dave and Himanshu B Dave Pearson Education

6B16CSC – E05

Data Compression

Contact Hours /Week : 4 Credit : 3

Module I

Data Compression Lexicon : Introduction to data compression – Dawn age – coding – Modeling – Ziv and Lempel lossy compression. Minimum redundancy coding (the Dawn age) : The shanon – fano algorithm.

Module II

The Huffman algorithm:– Adaptive Huffman code : Adaptive coding, - Arithmetic Huffman coding : Arithmetic coding.

Module III

Statistical modeling: Higher order modeling – Finite context modeling –adaptive modeling . Dictionary – based compression: static vs adaptive – ARC. Sliding window compression: The algorithm – LZSS Compression .

Module IV

LZ78Compression – Decompression. Speech compression : Digital audio Concepts – Lossless compression of sound. Silence Compression

Module V

Image Compression, Lossy Graphics Compression, Video compression – JPEG compression , DCT Compression,

Text book

1. Mark Nelson; “The data Compression Book”, BPB 2003

Reference:

1. Khalid Sayood, “Introduction to Data compression”, Morgan Kaufman, 2003
2. David Salomon, “Data Compression The Complete Reference” Springer 4th Ed 2007.
3. Thomas F Quatieri. “Discrete-Time Speech Signal Processing” Pearson 2012
4. David S. Tanbman and Michael W Marcellin, “JPEG – 2000 Image Compression fundamentals, Standard Practice”, Kluwer Academic, 2002.

6B16CSC – E06

Information Security

Contact Hours /Week : Theory:4 Credit: 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.

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 Block Ciphers - stream ciphers, block ciphers.

Module III

DES:Data Encryption Standard:- Introduction, DES Structure - initial and final permutations, rounds, Key Generation examples; DES Analysis - properties-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, The 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", William Stallings, Pearson Education (For Module - IV).

Reference Text

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

5D01CSC

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, 1edn, 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
5D01CSC 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)

2. Differentiate between structure and union.
3. What are C Tokens.
4. How will you read and write a character in C.
5. List and explain logical operators in c.
6. 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)

7. With suitable examples, explain break and continue statements.
8. With suitable example(s), explain parameter passing techniques in c functions.
9. What is an array? Write a program to read values to an array and display the largest among them.
10. 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)

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

5D02CSC

Web Technology

Contact Hours/Week: Theory 2 Credit: 2

Module I

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 II

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

Module III

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

Module IV

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 V

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 Programmer)

Model Question Paper
5D02CSC Web Technology

Time: 2 Hrs

Max. Marks: 20

SECTION A

1. Answer 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 oftag.
- 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 THREE of the following questions (3x 2 = 6 marks)

2. Write a note on Javascript.
3. What is meant by events and event handlers?
4. What is the use of <noframe> tag?
5. How can you create arrays in PHP ?
6. Explain the Location object.

SECTION C

Answer ANY TWO of the following questions

(2x 3 = 6 marks)

7. Explain the creation of frames in HTML.
8. Write short note on the Date object.
9. List the advantages of PHP.
10. Explain the different physical style tags.

SECTION D

Write an essay on ANY ONE of the following questions

(1 x 4 = 4 marks)

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

5D03CSC

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-ables 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 3rd 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
5D03CSC Database Management System

Time: 2 Hrs

Max. Marks: 20

SECTION A

- 1. Answer in one word** **(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. ----- is the total no. of entity sets participating in a relationship
 - 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. 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)**

2. Explain about INSERT command?
3. What is the usage of CREATE command?
4. Which are the different types of attributes?
5. Explain UPDATE command.
6. Define foreign key.

SECTION C

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

7. Explain the advantages of DBMS?
8. Which are the different types of keys?
9. Explain components of SQL?
10. Write a note on ALTER command?

SECTION D

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

11. Explain ER data Model.
12. Write a detailed note on normalization

COMPLEMENTARY COURSE

1C01CSC

Fundamentals of Computers & Programming Languages

Contact Hours per Week : 2 Theory Credit : 2

Module I

Introduction to Computers: Characteristics, Generation, Classification, CPU- ALU, Registers, Control Unit, System Bus, Main Memory Unit, Cache Memory. Types of RAM & ROM. Secondary storage devices: magnetic, optical and magneto-optical storage devices. Mass storage devices.

Module II

Representation of information: number system, binary, octal, hexadecimal system, conversion between number systems, different code used BCD, ASCII, EBCDIC, GRAY Code

Module III

System software: Assembler- compiler- interpreter- loader- linker - Operating Systems: Functions of OS- importance- Batch processing system- Multi programming- Time sharing system- Real time OS.

Module IV

Introduction to Computer networking- Goals- topologies-bus- star- ring- mesh- graph-tree- transmission modes- transmission media - classification of networks- LAN, WAN, MAN

Module V

Computer Programming: Introduction, Developing a program, program development cycle, Algorithm, Flowchart, program control structures, programming paradigms. Assembler, Compiler and Interpreter. Characteristics of a good program, Program structure, top-down design, source code, object code, executable file, file extensions.

Text Book :

1. V. Rajaraman, Introduction to Information Technology, Prentice Hal
2. Stuart E Madnick and John J Donovan, "Operating Systems", Tata McGraw-Hill, 2005
3. A S Tanenbaum . Computer Networks 3rd Edn Pearson Pub

Reference books:

1. Computer Networks – Fundamentals and Applications, Rajesh, Easarakumar & Balasubramaian, Vikas pub
2. B Forousan, Introduction to data communication and networking
3. Pradeep.K. Sinha &Priti Sinha, Computer Fundamentals, BPB Pub
4. Peter Norton, Introduction to Computers,6e,(Indian Adapted Edition)
5. Alexis & Mathews Leon, Fundamentals of Information Technology, Leon Vikas

Model Question Paper 1C01CSC Fundamentals of Computers & Programming Languages

Time: 3 Hrs

Max. Marks: 32

SECTION A

1. **One word answer** **(6 x 0.5 = 3 marks)**
 - a. The fastest memory in a computer system is-----
 - b. -----enables the processor to access data quickly whenever they are needed.
 - c. EBCDIC stands for-----
 - d. In a batch processing system a sequence of jobs is called....
 - e. In anetwork configuration, nodes share a single communication channel
 - f. is a transmission media consist of two insulated copper wire arranged in a rectangular spiral pattern

SECTION B

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

2. Define an algorithm.
3. What is system software?
4. What is the difference between compiler and interpreter?
5. What is meant by mode of transmission?
6. List various types of operating systems
7. Explain any two network topologies
8. What are the different types of computers?
9. What is meant by a digit in number systems? Give examples.

SECTION C

Answer ANY THREE of the following questions (3 x 3 = 09 marks)

10. Explain the features of a good programming language
11. Discuss three basic program control structures with suitable examples.
12. What is cache memory?
13. Explain LAN, WAN, MAN
14. What is time sharing system?

SECTION D

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

15. What is an operating system? Explain the role of an OS
16. Explain various network topologies in details
17. Explain about main and secondary memory.
18. Explain various numbers systems in details.

2C02CSC

Programming in C

Contact Hours per Week : 2 Theory Credit : 2

Module I

Importance of C; Basic structure of C, Executing a C program- Character set - C tokens, Keywords, Identifiers, Constants, Data types, Declaration of variables, Operators. Precedence and order of evaluation.

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: Introduction to Arrays - One Dimensional Array - Strings Two Dimensional Array - Multi- dimensional Array. Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat & strrev. Two dimensional arrays of strings

Module IV

Functions: Introduction to Functions, Function Declaration and Prototypes- call by value and call by reference- , Storage Classes - Recursion. Pointers: Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer

Module V

Structures and Unions: Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Union-Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable.

Text Book :

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication
2. Computer Basics and C Programming, V. Rajaraman, PHI, 2008

3. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1st edn, Pearson Education
4. Let us C, Yashavant Kanetkar, BPB Publications

Reference books:

1. Computer Fundamentals and Programming in C, AnitaGoel, Ajay Mittal, Pearson Education
2. Deitel, H M and Deitel P J: "C How to Program", 2nd Edition. Prentice-Hall
3. Gottfried, Byron S: "Programming with C", 1996. Tata McGraw-Hill

Model Question Paper 2C02CSC Programming in C

Time: 3 Hrs

Max. Marks: 32

SECTION A

1. **One word answer** **(6 x 0.5 = 3 marks)**
 - a. For a character function, we must include the header file in the program
 - b. Maximum number of elements in the array declaration int a[5][8] is.....
 - c. A function that calls itself is called
 - d. A pointer hold
 - e. A function malloc() is used for.....
 - f. The modeis used for opening a file for updating

SECTION B

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

2. What is recursive function?
3. Explain any three string functions
4. Explain variable access through pointer.

5. What is the syntax of a structure?
6. Write syntax of for loop.
7. What is function proto type?
8. Define an Array.
9. Give suitable examples for array of structures and array within structure.

SECTION C

Answer ANY THREE of the following questions (3 x 3 = 9 marks)

10. What are the differences between structure and union
11. What is a string? Write a simple c program using string function.
12. What is the difference between entry controlled and exit controlled loops?
13. Explain call by value and call by reference.
14. What is meant by storage class? Explain.

SECTION D

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

15. Explain the working of a switch statement with example.
16. What are the advantages of using functions? What are the different methods to pass arguments to functions?
17. Write a program to read two matrices and find its product.
18. Write a simple c program for structure and union.

3C03CSC

Database Management System

Contact Hours per Week: 3 Theory Credit: 2

Module I

Introduction – Advantages of Database systems. View of Data, data Models, database system architecture, Field, Record, Entity, Attribute, Relation, Domain,

Module II

Data Base Users and administrators, Constraints, Keys (Candidate, Primary, Super, Foreign), Relational Algebra – Fundamental operations, E-R Model, E-R diagrams.

Module III

Normalization (First, Second, Third, BCNF), SQL: Introduction to SQL Tables – DDL, DML, DCL, Data types.

Module IV

Visual Basic: What is Visual Basic, Structure of a VB Application, Steps in developing Application, drawing the user interface and setting properties, setting properties of objects at design time and at runtime variables.

Module V

VB data types , variable declaration, VB operators and functions, Branching statements – if then , go to, select-case, Looping statements, Do-While-Loop, Do-Loop-While, Do-Until-Loop, Do-Loop-Until, While-wend, for-next, Arrays and control arrays.

Text book .

- 1.Data Base Concept 3rd edition Abraham Silberschatz, Henry f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley
3. Visual Basic 6, G Cornell, Tata McGraw Hill

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.
4. Visual Basic 6 Programming Black Book, Steven Holzner, Dreamtech Press

Model Question Paper

3C03CSC – Database Management System

Time: 3 Hrs**Max. Marks: 32****SECTION A****1. One word answer****(6 x 0.5 = 3 marks)**

- a. Command is used to remove a table from database
- b.clause is used to impose sorting on the query results
- c. A relational database consists of a collection of.....
- d. Multiline is the property of control
- e. Write the syntax of the msgbox
- f. OLE stands for.....

SECTION B**Write short notes on ANY FIVE of the following questions****(5 x 2 = 10 marks)**

2. What is primary key?
3. Explain about insert command
4. Explain update command
5. Explain field , record and entity
6. Define use of DML
7. Define 2NF
8. What is the need of go to statement in VB?
9. Define a variable in VB

SECTION C

Answer **ANY THREE** of the following questions

(3x 3 = 9 marks)

10. Explain the advantage of DBMS
11. Explain the components of SQL
12. Write a notes on three SQL commands with example
13. What is control array? Explain
14. Explain various do loop in VB

SECTION D

Write an essay on **ANY TWO** of the following questions

(2 x 5 = 10 marks)

15. What do you mean by database administrator? Explain function of DBA
16. Explain E –R model in details
17. Explain various looping statements in VB with examples
18. What is meant by Normalization? Explain different types of normalization with suitable examples.

4C04CSC

Visual Programming

Contact Hours / Week : 3 Theory Credit : 2

Module I

SQL functions (Different types of functions), Operators (Arithmetic, Relational, Logical), Sub queries(in detail), Order by clause.

Module II

Joins (Different types of join), View, Introduction to sequence, Index and Triggers.

Module III

VB Controls: Button, Label, ,Text Box, List Box, Combo Box, Picture Box, Image Box, Check Box, Option Button, Timer, Frame, Scroll Bar, Line and Shape. Designing an application, Using general sub procedures in applications, Code module, Menu-Editor (Note editor).

Module IV

Error Types, Debugging VB programs, Debugging strategies, Sequential files, writing and adding text using sequential files. Random access files, writing and reading text using random access files, graphics methods, timer tools, animation techniques.

Module V

Database structure and terminology- ADO data control, Assigning tables, Bound data tools, Connection to the Database –Simple database programs. Multiple form visual basic applications, VB multiple document interface (MDI)

Text Book

1. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan
2. Visual Basic 6, G Cornell, Tata McGraw Hill

Reference

1. Data Base Concept 3rd edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley
3. Visual Basic 6 Programming Black Book, Steven Holzner, Dreamtech Press,

Model Question Paper
4C04CSC Visual Programming

Time: 3 Hrs

Max. Marks: 32

SECTION A

1. One word answer (6 x 0.5 = 3 marks)

- a. The result of query can be arranged in ascending or descending order usingclause.
- b. The part of the query following WHERE is usually called
- c. Average of a column can be calculated usingSQL function
- d. Ais a virtual table.
- e. ADO stands for
- f. Which VB control can be used to insert an image to the form?

SECTION B

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

2. What are the different types of errors in VB?
3. What is a random access file in VB?
4. What is use of timer control in VB
5. What is the significance of using order by in a query?
6. List various arithmetic operators used in SQL.
7. What is meant by triggers?
8. What is meant by MDI?
9. What are the basic controls used in VB?

SECTION C

Answer **ANY THREEE** of the following questions (3 x 3 = 9 marks)

10. What is meant by sequence? Give an example.
11. What are the differences between combo box and list box?
12. Write a note on menu editor.
13. Explain ADO control.
14. Explain subquery.

SECTION D

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

15. What are the different types of joins? Explain with examples
16. Explain various SQL functions with suitable examples.
17. Explain the connection between ADO and Database using simple program
18. Write the code to develop an application using basic controls of VB

4C05CSC

Lab I (C Programming, DBMS & Visual Basic)

Guidelines

- a. Students have to record a minimum of 25 programs.
- b. Students have to practice all the programs given in the list
- c. Lab consists of two sections, Section A programming with C and Section B DBMS and Visual Basic. Equal mark will be given for both sections.
- d. For internal assessment each section may be evaluated independently and final CA grade shall be obtained by combining them.
- e. End semester (4th Sem) examination question shall carry questions from both sections. Students have to write and execute both programs.

Sample Programs List

Procedure Oriented Programming Using C

1. Develop a program to find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7.
2. Program to read a floating point number and display the right most digit of its integral part.
3. Admission to a professional course is subject to the following conditions:
 - a) Marks in mathematics ≥ 60 .
 - b) Marks in Physics ≥ 50 .
 - c) Marks in Chemistry ≥ 40 .
 - d) Total in all three subjects ≥ 200 Or
 - e) Total in Mathematics and Physics ≥ 150 .

Given the marks in the three subjects, develop a program to print whether an applicant is eligible or not.

4. Develop a program using do-while loop to print the first n fibonacci numbers.
5. Develop a program to sort a list of n positive integers in ascending/descending order.

6. Implement a simple calculator using switch statement
7. Program to find the factorial of a number using recursion.
8. Program to find whether the string is palindrome or not.
9. Program to check whether the given number is prime or not.
10. Program to add and subtract two matrices
11. Program to find biggest, smallest, sum and difference of two numbers using functions.
12. Create a structure time comprises hr, min and sec. Use get(), add() and display() functions. Write a main function to add two time variables and display the resultant time.
13. Program to find the binary equivalent of a positive integer
14. Program to search a list of integers for a key k.
15. Program to sort a list of n names in alphabetical order

DBMS. [Sample exercises are given below]

SQL -1

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.

- a) Alter the table by adding one more field rank.
- b) Display all boy students with their name.
- c) Find the Average mark
- d) 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.
- e) Create a sequence named 'star' to be used with student tables primary key
- f) column-sno. The sequence should start with 10 & max value 99
- g) 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.

- a) Rename the field 'place' with 'city'
- b) Display the employees who got salary more than Rs.6000 and less than 10000 /-
- c) Display total salary of the organization
- d) Display ename for those who are getting salary in between 5000 and 10000.
- e) Create a view named 'Star' with field ename, salary & place

- f) display ename and salary, salary rounded with 10 digits**'

SQL -3 Create table loan with fields loanno, cname, cid, bname assigning suitable constraints. Insert 5 Records in to the table.

- a. Calculate Rs 150 extra for all customers having loan. The added loan amount will display in a new coloumn.
- b. Add one more field amount to loan table. Display cname for cid=2.
- c. Create table depositor with fields cid and accno.
- d. Insert five records into the table.
- e. Display loanno and cname of a customer who is residing in Kannur city.
- f. Display all information from loan table for loanno 2,8,10.

Visual Basic [Sample Program List]

1. Create a Calculator.
2. Write a program for traffic signal with the help of Timer.
3. Write a program to find out factorial, Fibonacci and prime numbers using list box.
4. Write a program to perform sequential File operation.
5. Write a program to perform Random File Operation.
6. Create a menu driven program for Graphic operation (Drawing different colour schemes, file style, border, free hand Drawing-Keyboard and Mouse).
7. Perform bank operations using Data access objects.
8. Create a student database using data controls
9. Create a telephone directory.

Sd/-

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