

## B.Sc IT

### Computer Fundamentals and Digital Electronics - 1 Sem

#### C1

1. What is computer? Explain the classification of computers in detail.
2. (a) Add binary numbers  $10011.12+11011.012$   
(b) Multiply the binary numbers  $1112*1012$   
(c) Subtract the binary numbers  $11002-10012$   
(d) Divide the binary numbers  $10002/10$
3. Encode the following decimal number in BCD code:-  
a) 786 b) 5291.09 c) 8916

#### C2

1. Prepare a karnaugh map for the following functions.  
(a)  $F = ABC + A'BC + B'C'$   
(b)  $F = A + B + C$   
(c)  $Y = AB + B'CD$
2. Design a half-adder using NOR gates only.
3. Distinguish between the following:  
(a) Decoders and encoders  
(b) Multiplexer and Demultiplexer

### Concept of 'C' Programming - 1 Sem

#### C1

1. Explain the different types of constants available in 'C'
2. Write a program to accept the currency in dollars convert it into rupees and display the result.
3. Write a program to compute the area of following geometric shapes :  
(a) Rectangle (b) Cone (c) Cylinder.

## C2

1. Write a 'C' program to accept the color of the rainbow in integer (1-orange, 7-red) and display the color in words using switch statement.
2. Write a 'C' program to generate 'N' terms of a Fibonacci series using recursion.
3. Write a 'C' program to remove all duplicate element in an array.

## Discrete Mathematical Structure

- I Sem

### C1

1. What is set? Discuss its types in details with suitable examples.
2. Discuss Cartesian product and tree representation with a neat diagram.
3. Explain Well Formed Formula (WFF) Tautology and contradiction with examples.

### C2

1. Explain Mathematical induction with examples.
2. Discuss pigeonhole principle with an example.
3. What are isomorphic graphs? State the conditions for graphs to be isomorphic give examples.

## Advanced Concept of 'C' programming

- II Sem

### C1

1. Explain all the library functions with syntax. Example to read the strings.
2. Discuss pointer expressions with examples.
3. What is points to pointer ? Explain with example.

## C2

1. Explain with example creating a text file.
2. Discuss formatted and unformatted I/O functions with example.
3. (a) Describe set fill style () and flood fill () graphics function.  
(b) Briefly explain displaying text in 'C' graphics.

## Fundamentals of Data Structures.

- II Sem

### C1

1. Write an algorithm to convert infix to postfix
2. What is Stack ? Explain the basic operations of stack data structures.
3. What is Dequeue ? Explain different types of dequeue with suitable example.

### C2

1. What are linked lists considering all possible cases.
2. What are circular linked lists? Design an algorithm to delete alternative occurrence of an element from a circular linked list.
3. What is meant by traversing a binary tree? Describe the in order, preorder, post order procedure to traverse a binary tree represented on adjacency matrix.

## Matrix Algebra

- II Sem

### C1

1. If two rows (or columns) of a determinant are interchanged then the value of the determinant changes in sign only.
2. Find the adjoint of the Matrix  $A = \begin{pmatrix} 1 & 2 \\ 3 & 6 \end{pmatrix}$
3. Find all eigen values and eigen vectors of Matrix :  $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

C2

1. Find the rank of the matrix using normal form  $\begin{bmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{bmatrix}$

2. Show that the set of all  $2 \times 2$  matrices over the field of real numbers is a vector space.

3. Find the matrix of linear transformation  $T : \mathbb{R}^2 \rightarrow \mathbb{R}^3$  defined by  $T(x,y) = (2x-5y, 3x+y)$  relative to the basis  $\{(2,1), (3,2)\}$  of  $\mathbb{R}^2$