

**BACHELOR OF COMPUTER APPLICATIONS
(BCA) (Pre-Revised)**

Term-End Examination

December, 2016

00385

**CS-62 : 'C' PROGRAMMING AND DATA
STRUCTURES**

Time : 2 hours

Maximum Marks : 60

Note : *Question number 1 is compulsory. Answer any three questions from the rest. All algorithms should be written nearer to 'C' language.*

1. (a) Write an algorithm for the addition of two matrices. 2
- (b) Explain the following functions in 'C' with examples : 4
- (i) malloc()
- (ii) calloc()
- (c) Write an algorithm to add two polynomials when they are represented using linked lists. 7

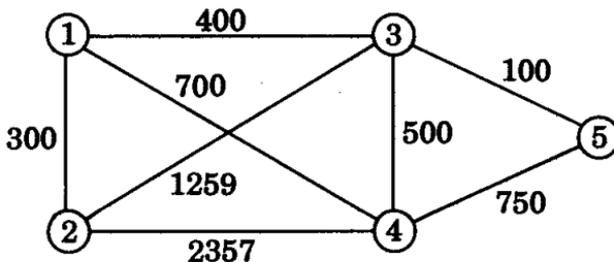
- (d) Differentiate between sequential search and binary search. Write their algorithms and analyze the techniques for complexity. 10
- (e) Define 'Tree' and 'Binary Tree'. Explain the differences between them. 7
2. (a) Give a brief description of operations that can be performed on a stack. 3
- (b) Discuss the advantages, if any, of a two-way list over a one-way list when deleting a node whose location is given. 2
- (c) Convert the following infix expression to postfix expression : 5

$$A * (B + D) / E - F * (G + H/K)$$

3. (a) Insert the following keys in order to construct an AVL tree : 5

5, 4, 3, 1, 2

- (b) What is a Minimum Cost Spanning Tree ? Convert the given graph G with weighted edges to a minimal spanning tree : 5



4. (a) Write an algorithm for implementation of various operations on a circular queue. 5

(b) Consider the following circular queue (max capacity = 6):

-, A, B, C, -, -

where front = 2 and rear = 4.

Describe the queue as the following operations take place: 5

- (i) Add D, add E
- (ii) Delete two elements
- (iii) Add F, G, H
- (iv) Delete one element
- (v) Delete two more elements

5. Write short notes on the following: $4 \times 2 \frac{1}{2} = 10$

- (a) Adjacency Matrix
 - (b) Sorting
 - (c) Indexed Sequential File Organization
 - (d) Sparse Matrices
-