

2019

B.Sc. (Hons)

4th Semester Examination

COMPUTER SCIENCE

Paper - C8T

(Design & Analysis of Algorithm)

Full Marks : 40

Time : 2 Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group-A

1. Answer any five questions : 5×2=10
- (a) Write down the properties of an algorithm.
 - (b) What is time complexity and space complexity?
 - (c) List three traversal algorithms in a binary tree.
 - (d) State general principle of greedy algorithm.
 - (e) What are BFS and DFS ?

[Turn Over]

- (f) What is the time complexity of best, worst, average case of Quick sort algorithm ?
- (g) What is called divide-and-conquer strategy ?
- (h) Explain concept of recursive algorithm technique.

Group - B

2. Answer any *four* of the following : 4×5=20

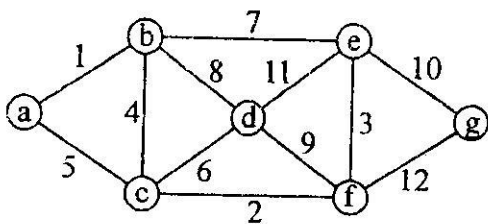
- (a) Briefly explain the concept of Big 'oh' notation, omega notation and theta notations.
- (b) Given two sorted sub-array A[p...q] and B[q + 1, ..., r]. Write an algorithm to merge the two sorted sub-arrays into one sorted array C[p,...,r].
- (c) How will you solve a knapsack problem using dynamic programming ? Explain briefly.
- (d) Illustrate the tracing of quick sort algorithm for the following set of numbers : 96, 25, 41, 54, 63, 39, 78, 16.
- (e) Write down the pseudo code for KMP algorithm.
- (f) Calculate the time complexity of Mergesort algorithm.

Group - C

3. Answer any *one* questions :

1×10

- (a) (i) Write Prim's algorithm to find a minimum cost spanning tree (MCST) of a graph. Find MCST for the following graph using Prim's algorithm. Consider 'a' as the starting vertex.



- (b) (i) Write down the matrix chain multiplication algorithm using dynamic programming. 8
- (ii) Calculate the time complexity of binary search algorithm. 2