

2022

COMPUTER SCIENCE

B.Sc. Fourth Semester End Examination - 2022

PAPER - C8T

Full Marks : 40

Time : 2 hours

*The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in their own
words as far as practicable.
Illustrate the answers wherever necessary.*

Group -A

1. Answer any five question : 5×2
- a) Arrange in increasing order of growth :
- (i) $O(n^3)$ (ii) $O(n \log n)$
(iii) $O(n^2)$ (iv) $O(\sqrt{n})$
- b) What is the difference between divide-and-conquer strategy and dynamic programming strategy?

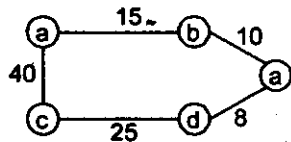
(Turn Over)

(2)

- c) Differentiate between graph and spanning tree.
- d) What do you mean by stable sort?
- e) Differentiate between sorting and searching.
- f) What is the time complexity of best, worst and average case of Binary search algorithm?
- g) Find Big-Oh(0) of the following equation $2x^3+3x^2+1$ using formula.
- h) Explain the concept of recursive algorithm technique.

Group - B

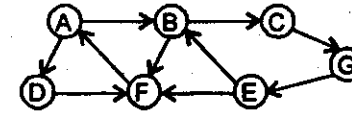
2. Answer any four questions. 4×5
- a) Write down the Pseudo code for KMP algorithm.
 - b) Draw all spanning trees of the following weighted connected graph.



- c) Perform insertion sort of the following input.
28, 6, 29, 90, 5, 42, 80
- d) Briefly explain the radix sort technique with example.

(3)

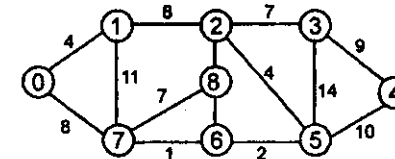
- e) Find the BFS sequence of the following graph using queue data structure with starting vertex A.



- f) Show that 6 divides n^3-n , where n is a non-negative integer by Mathematical induction.

Group - C

3. Answer any one question. 1×10=10
- a) Write Prim's algorithm to find a minimum cost spanning tree of a graph. Find the minimum cost spanning tree for the following graph using Prim's algorithm.



- b) What is binary heap? Using heap sort technique, arrange the following set of numbers in ascending order :
84, 92, 7, 15, 18, 78, 52, 20
What is the time complexity of this sorting in best, worst and average case?