Roll No. .....

35001

Printed Pages : 3

BT–5 / D–17

DESIGN AND ANALYSIS OF ALGORITHMS

Paper–CSE–301

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt **five** questions in all, selecting at least **one** question from each unit. All questions carry equal marks.*

Unit–I

1. (a) What do you understand by asymptotic notations of analyzing algorithms ? Does it always give correct and accurate running times ? Justify your answer.

(b) What is a recurrence relation ? How does it help in finding the complexity of programs ? How to solve recurrence relation using Back substitution method ? Explain.

2. What is priority queue ? Show that heap sort takes O (n Log n) time to sort n elements.

Unit–II

3. (a) What is dynamic programming ? How it is different from Divide and Conquer ? Give some examples of both approaches.

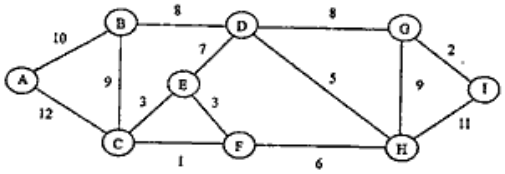
(b) Explain activity selection problem using suitable example and derive the algorithmic complexity of its solution.

4. What is a B-Tree ? Why they are needed ? Explain using suitable example.

Unit–III

5. (a) Explain topological sorting of graphs. What do you understand by strongly connected components of a graph ? Explain using suitable example.

(b) What do you mean by Minimum spanning tree ? Find the minimum spanning tree of following graph :



6. What is shortest path in a graph ? Explain Bellman-Ford algorithm to find the shortest path between nodes of following graph edge list :

Start Edge	End Edge	Weight
A	B	4
A	C	5
B	D	-3
C	D	1
D	E	7

Unit–IV

7. Explain the flow networks using suitable example. What is Ford-Fulkerson method of finding the Maximum flow and Minimum Cut of a flow network ? Explain.

8. Explain :
   (a) Zero-One principle
   (b) Bitonic Sorting.