

This question paper contains 4 printed pages]

**AF—500—2010**

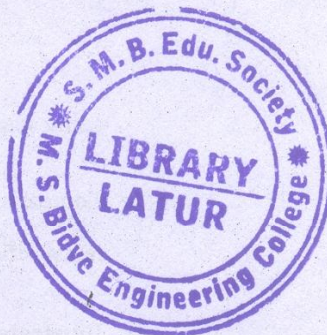
**FACULTY OF ENGINEERING**

**S.E. (CSE) EXAMINATION**

**MAY/JUNE, 2010**

**(New Course)**

**COMPUTER ALGORITHMS**



**(Friday, 4-6-2010)**

**Time : 10.00 a.m. to 1.00 p.m.**

*Time—Three Hours*

*Maximum Marks—80*

*N.B. :— (i) All questions are compulsory.*

*(ii) Figures should be indicated full marks.*

**Section A**

1. Solve any *two* :

- |  |   |
|--|---|
| (a) Write an algorithm of quick sort.                | 6 |
| (b) What kind of problem is solved by an algorithm ? | 6 |
| (c) State and explain master theorem.                | 6 |

**P.T.O.**



2. Solve any two :

(a) Find out the time complexity of given function

$$T(n) = 2T(\sqrt{n}) + \log n$$

using master method and prove that using substitution method. 7

(b) Compare greedy method and dynamic programming ? Which is more efficient ? Explain with an example. 7

(c) Illustrate the operation of Build - Max - Heap on arrays

$$A = \{5, 3, 17, 10, 84, 19, 6, 22, 9\}$$

7

3. Solve any two :

(a) Find optimal binary search tree using dynamic programming set of keys  $n = 4$ . 7

	0	1	2	3	4
$q_i$	0.5	0.15	0.05	0.05	0.3
$p_i$	-	0.10	0.10	0.05	0.1

(b) Determine an LCS of  $\{1, 0, 0, 1, 0, 1, 0, 1\}$  and

$\{0, 1, 0, 1, 1, 0, 1, 1, 0\}$

7

(c) Explain assembly line problem with example. 7

## Section B

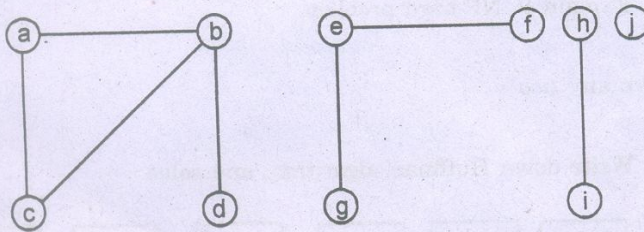
4. Solve any two :

(a) Explain activity selection problem with example.

6

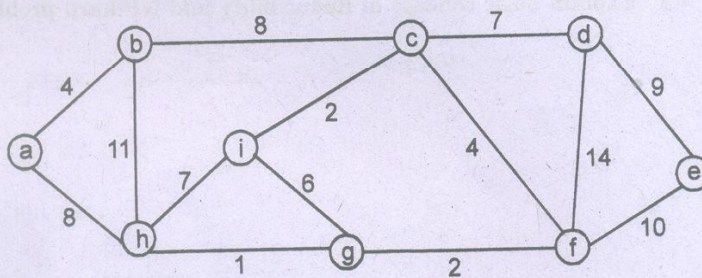
(b) Find connected component for undirected graph.

6



(c) Construct minimum cost spanning tree using Kruskal's for the following graph.

6



5. Solve any two :

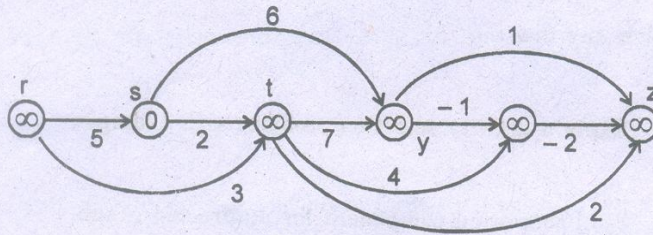
(a) Write Bellman-Ford algorithm.

7

P.T.O.



- (b) Find single source shortest path in directed acyclic graph. 7



- (c) Explain P, NP-hard problem. 7

6. Solve any two :

- (a) Write down Huffman algorithm, and solve 7

F : 5	e : 9	c : 12	b : 13	d : 16	a : 45
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- (b) Find an optimal parenthesization of Matrix-Chain product whose sequence of dimension  $\langle 1, 2, 3, 4, 5, 6, 7 \rangle$  7

- (c) Explain basic concept of Reducibility and NP-hard problem. 7