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Part-II

BR—90—2012

FACULTY OF ENGINEERING

S.E. (CSE) EXAMINATION

NOVEMBER/DECEMBER, 2012

(New Course)

COMPUTER ALGORITHM

(Saturday, 29-12-2012)

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

Time—Three Hours

Maximum Marks—80

N.B. :— (i) Question Nos. 1 and 6 are compulsory.

(ii) Solve any *two* from Q. No. 2 to Q. No. 5 and
Q. No. 7 to Q. No. 10.

(iii) Figures to the right indicate full marks.

Section A

1. (a) Define algorithm. Explain what kinds of problems are solved
by algorithm. 7

(b) Write an algorithm for insertion sort. Sort the following
elements

$A = \{5, 2, 4, 6, 1, 3\}$

using an algorithm. 7

P.T.O.

2. (a) Define different types of asymptotic notation. 7

- (b) Explain recursion tree method. Draw the recursion tree for :

$$T(n) = 4T\left(\left\lfloor \frac{n}{2} \right\rfloor\right) + Cn$$

where C is a constant, and provide a tight asymptotic bound

on its solution. 6

3. (a) Write an algorithm for quicksort. Show the operation of PARTITION on the array : 7

A = {13, 19, 9, 5, 12, 8, 7, 4, 11, 2, 6, 21}.

- (b) Show the operation of BUILD-MAX-HEAP on the array element : 6

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

4. (a) Write and explain analysis of quicksort. 6

- (b) Determine an LCS of :

{1, 0, 0, 1, 0, 1, 0, 1} and

{0, 1, 0, 1, 1, 0, 1, 1, 0}

using algorithm. 7

5. (a) Find an optimal parenthesization of matrix-chain product

whose sequence of dimensions is : 7

{5, 10, 3, 12, 5, 50, 6}. 8

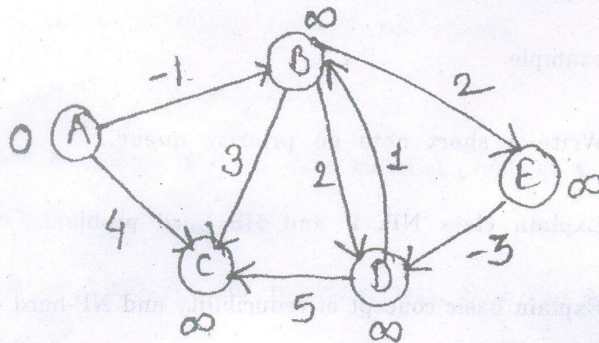
- (b) Write an algorithm for optimal-binary search trees. 6

Section B

6. (a) Explain elements of Greedy strategy. 7

- (b) Find single source shortest path using Bellman-Ford algorithm

for the following path : 7



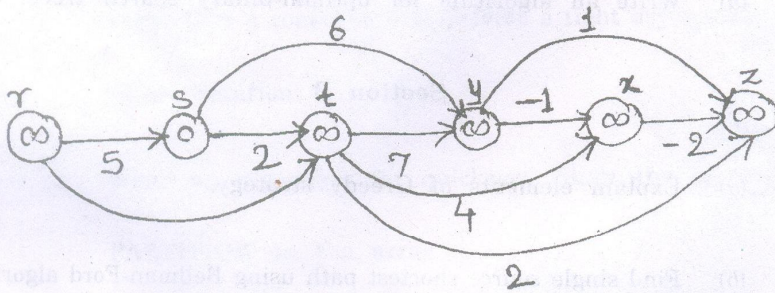
7. (a) Define greedy method. Explain activity selection problem with example. 7

P.T.O.

- (b) Write down Huffman algorithm and solve : 6

F : 5	e : 9	C : 12	b : 13	d : 16	a : 45
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8. (a) Find Single Source Shortest Path in directed acyclic graph. 7



- (b) Write an algorithm for Kruskal's method. 6
9. (a) Explain linked list representation of disjoint sets, with example. 7
- (b) Write a short note on priority queue. 6
10. (a) Explain class NP, P and HP hard problem. 7
- (b) Explain basic concept of reducibility and NP-hard problem. 6