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BK—99—2014

FACULTY OF ENGINEERING

S.E. (CSE) EXAMINATION

NOVEMBER/DECEMBER, 2014

(New Course)

COMPUTER ALGORITHM

(Saturday, 27-12-2014)

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

Time—Three Hours

Maximum Marks—80

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

(ii) Assume suitable data, if necessary.

(iii) Figures to the right indicate full marks.

(iv) Use separate answer-book for each Section.

Section A

1. Solve any two :

2×6=12

(a) Define an algorithm. What kinds of problems are solved by algorithm ?

P.T.O.

- (b) Write an algorithm of Insertion sort. Illustrate the operation of Insertion sort on the array :

$$A = \{31, 41, 59, 26, 41, 58\}.$$

- (c) Explain Asymptotic notation Θ , O , Ω in detail.

2. Solve any two :

2×7=14

- (a) State and prove the Master theorem.

- (b) Illustrate the operation of BUILD-MAX-HEAP on the array :

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

- (c) Explain Assembly-Line Scheduling with suitable example.

3. Solve any two :

2×7=14

- (a) Determine an LCS of :

$$\langle 1, 0, 0, 1, 0, 1, 0, 1 \rangle \text{ and } \langle 0, 1, 0, 1, 1, 0, 1, 1, 0 \rangle.$$

- (b) Explain an elements of Dynamic Programming.

- (c) Find an optimal parenthesization of a Matrix-chain product whose sequence of dimensions is :

$$\langle 5, 10, 3, 12, 5, 50, 6 \rangle.$$

Section B

4. Solve any two :

2×6=12

- (a) Explain an activity-selection problem in detail.
- (b) What is an optimal Huffman code for the following set of frequencies :

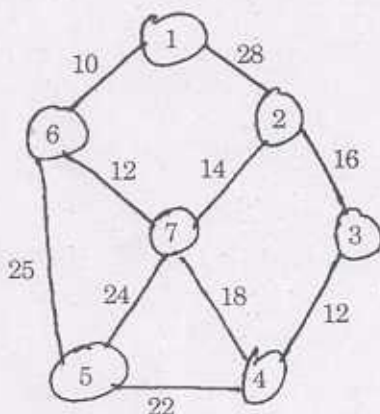
$a : 1, b : 1, c : 2, d : 03, e : 05, f : 08, g : 13, h : 21.$

- (c) Explain Linked-list representation of disjoint sets.

5. Solve any two :

2×7=14

- (a) Write Bellman-Ford algorithm.
- (b) Explain NP-Completeness and reducibility.
- (c) Compute MST for the following graph using Prim's algorithm.



P.T.O.

6. Solve any two :

2×7=14

(a) Explain P, NP and NP-hard problem in detail.

(b) Explain Properties of Greedy method.

(c) Execute Dijkstra's algorithm for given graph.

