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Z-440-2011

FACULTY OF ENGINEERING

S.E. (CSE) EXAMINATION

MAY/JUNE, 2011

(New Course)

COMPUTER ALGORITHM

(Tuesday, 7-6-2011)

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 to the right indicate full marks.

Section A

1. Solve any *two* of the following :

2×7=14

(a) Explain asymptotic notation and show that the solution to

$T(n) = 2T(\lfloor n/2 \rfloor) + n$ is :

$O(n \log n)$ by using master method.

(b) Write an algorithm of merge sort and sort the given

array :

$A = \{3, 41, 52, 26, 38, 57, 9, 49\}$.

(c) State and explain recursion tree method.

P.T.O.

2. Solve any *two* of the following : 2×6=12

(a) Write an Max-Heapify algorithm and illustrate the operation :

Max-Heapify (A, 3) on array :

$A = \{27, 17, 3, 16, 13, 10, 1, 5, 7, 12, 4, 8, 9, 0\}$.

(b) Explain priority queues.

(c) Calculate $O(\text{big "oh"})$ for

$$T(n) = 2T(\sqrt{n}) + 1$$

using substitution method.

3. Solve any *two* of the following : 2×7=14

(a) Explain assembly live scheduling problem with example.

(b) Show how to solve LCS problem using dynamic programming.

(c) Explain elements of greedy strategy.

Section B

4. Solve any *two* of the following : 2×6=12

(a) Explain linked representation of disjoint set.

- (b) Construct minimum cost spanning tree for the following graph using Prim's algorithm.

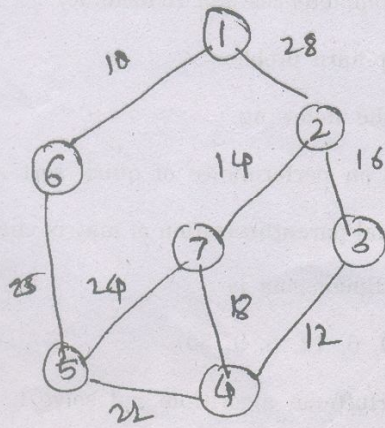


Fig. 1

- (c) Find single source shortest path using Dijkstra's algorithm for the following graph :

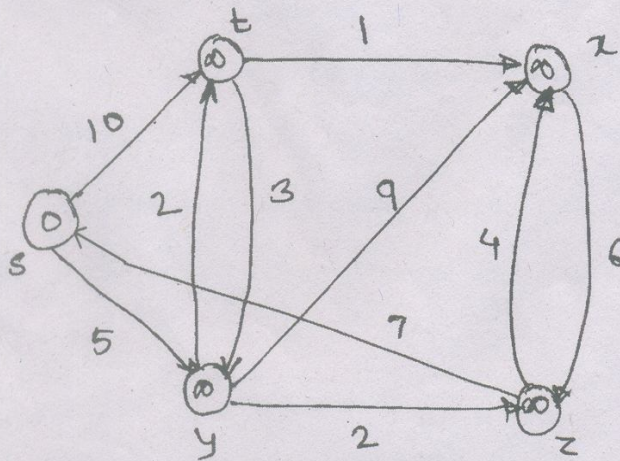


Fig. 2

P.T.O.

5. Solve any *two* of the following : 2×7=14

- (a) Explain Floyd-Warshall algorithm.
- (b) Explain Np-completeness and reducibility.
- (c) Explain p, Np-hard problem.

6. Solve any *two* of the following : 2×7=14

- (a) Write a note on performance of quick sort algorithm.
- (b) Find an optimal parenthesization of matrix chain product whose sequence of dimensions is :

(10, 20, 6, 12, 5, 9, 50).

(c) Write down Huffman algorithm and solve :

F:1

e:5

c:10

b:9

d:4

a:90