

Total No. of Pages 02

IVth SEMESTER

Roll No.

B.Tech. (CO)

END SEMESTER EXAMINATION

MAY-2018

CO-214 ALGORITHM DESIGN AND ANALYSIS

SE

(Old Scheme)

Time: 3:00 Hours

Max. Marks: 70

Note: Attempt any 5 questions. All questions carry equal marks.

Assume suitable missing data, if any.

Q1. (a) For each of the following recurrence solve them with the help of master theorem? [4X2=8]

(i) $T(n) = 16T\left(\frac{n}{4}\right) + n!$

(ii) $T(n) = 2T\left(\frac{n}{4}\right) + n^{0.51}$

(b) Solve $T(n) = 7T\left(\frac{n}{3}\right) + n^2$ with the help of recursion tree method. Show each and every step involved. [6 marks]

Q2. (a) Write algorithm to convert random array into a Max-heap. Also write algorithms for delete-Max() and Insert() for this Max-heap.

[7 marks]

(b) Solve following 0/1 Knapsack problem using dynamic programming for Knapsack capacity $W=16$.

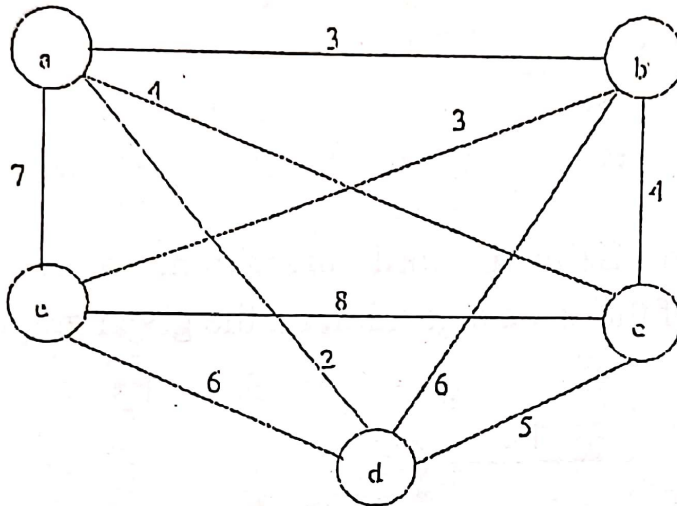
Item no.	weight	Value
1	4	40
2	7	42
3	5	25
4	3	12

[7 marks]

OLD

Q3. (a) Determine LCS of $\langle A, B, C, B, D, B, A \rangle$ and $\langle B, D, C, A, B, A \rangle$ using dynamic programming. Write algorithm and runtime complexity for the same? [7 marks]

(b) Solve travelling salesman by applying branch and bound for the given graph?



[7 marks]

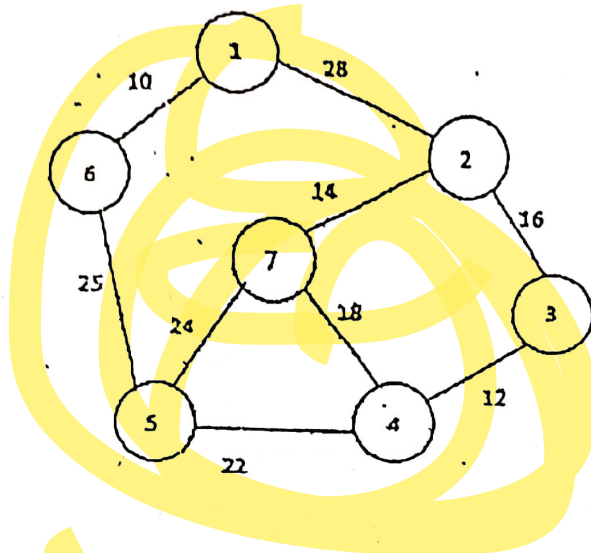
Q4. (a) Define backtracking phenomenon? Write the pseudo code for solving subset sum problem with the help of back tracking

[7 marks]

(b) Explain concept of Approximation algorithms. Write approximation algorithm for NP-Hard problem.

[7 marks]

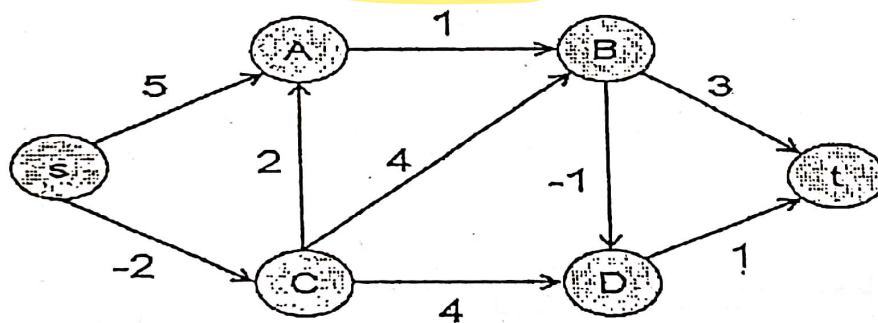
Q5 (a) Write down Dijkstra algorithm. Show step by step implementation of the same algorithm on the given graph with node 1 as the source node.



[7 Marks].

(b) Write down Bellman ford algorithm. Show step by step implementation of the same algorithm on the given graph

[7 marks]



Q6. Write short notes on

[7x2=14]

- (i) NP class
- (ii) NP compete class
- (iii) Circuit Satisfiability
- (iv) Big-oh
- (v) Big-omega
- (vi) Big-theta
- (vii) Vertex Cover Problem