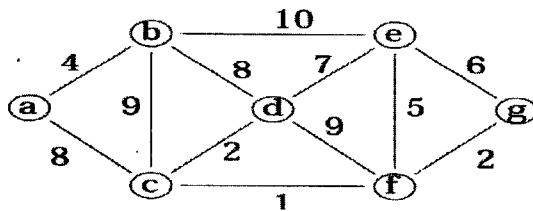


Unit III

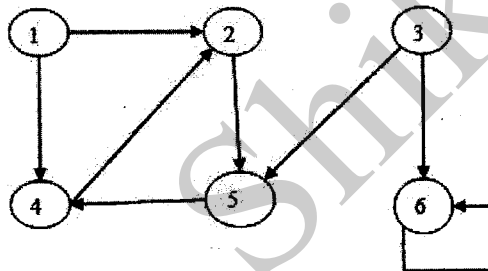
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Roll No.

5. What do you mean by minimum spanning tree ?
List and explain the different methods of obtaining minimum spanning trees. Find the MST for the given graph using Kruskal's Algorithm. 15



6. (a) What is topological sorting ? Explain with an example. 5
(b) Enlist the algorithm for obtaining a DFS traversal. Traverse the following graph using DFS : 10



18D3

B. Tech. EXAMINATION, June 2023

(Fourth Semester)

(C-Scheme) (Main & Re-appear)

(CSE)

CSE206C

DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Enlist the characteristics of a good algorithm. 5

(b) What do you understand by asymptotic notations ? Explain all the types of asymptotic notations. 10

2. (a) Illustrate the Master method for solving recurrence relations. Also solve the following recurrences by using Master method : 5

(i) $T(n) = 2T\left(\frac{n}{2}\right) + n^3$

(ii) $T(n) = T\left(\frac{9n}{10}\right) + n$

(b) Solve the following recurrences by using recursion tree method : 10

(i) $T(n) = T\left(\frac{n}{2}\right) + T\left(\frac{n}{4}\right) + T\left(\frac{n}{8}\right)$

(ii) $T(n) = 3T\left(\frac{n}{4}\right) + cn^2$

Unit II

3. (a) Compare and contrast dynamic programming and greedy programming strategies. 5

(b) Compare and contrast Branch and Bound method and backtracking method. 5

(c) What do you understand by Heuristic characteristics ? Also write their application domains. 5

4. Given that the knapsack capacity is 5 kg. Solve the following 0/1 Knapsack problem by using the following techniques :

(i) dynamic strategy

(ii) branch and bound strategy :

Item	:	1	2	3	4
Weight (kg)	:	2	1	3	2
Value(\$)	:	12	10	20	15

Unit IV

7. (a) What are NP-complete classes of algorithms ? Explain. **5**
- (b) What are approximation algorithms ? Illustrate the significance of approximation algorithms. **10**
8. (a) What are NP-hard classes of Problems ? Explain. **5**
- (b) State and prove Cook's theorem. **10**

Unit IV

7. (a) What are NP-complete classes of algorithms ? Explain. **5**
- (b) What are approximation algorithms ? Illustrate the significance of approximation algorithms. **10**
8. (a) What are NP-hard classes of Problems ? Explain. **5**
- (b) State and prove Cook's theorem. **10**