

BACHELOR OF TECHNOLOGY (CBCS) (2020 COURSE)
B.Tech.Sem - IV Information Technology : WINTER : 2023
SUBJECT : APPLIED ALGORITHMS

Day : Wednesday

Time : 02:30 PM-05:30 PM

Date : 22-11-2023

W-24721-2023

Max. Marks : 60

N.B.:

- 1) All questions are **COMPUSLORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data if necessary

Q.1 How do you analyse recursive algorithms through recurrence relations? [10]
Discuss the techniques in detail.

OR

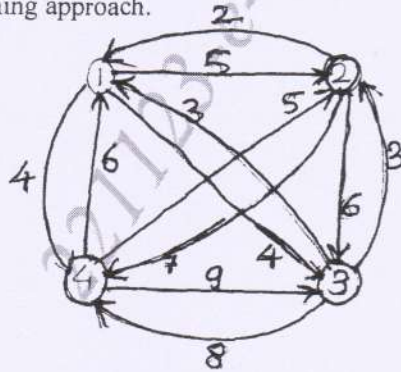
Q.1 Define the term time and space complexity. Describe different notations used to represent complexities with suitable example. [10]

Q.2 What is divide and conquer strategy? What are the advantages and disadvantages of divide and conquer strategy? Compare and contrast Merge sort and Quick sort. [10]

OR

Q.2 What are the merits and demerits of brute force approach? Write an algorithm for pattern matching using brute force approach. [10]

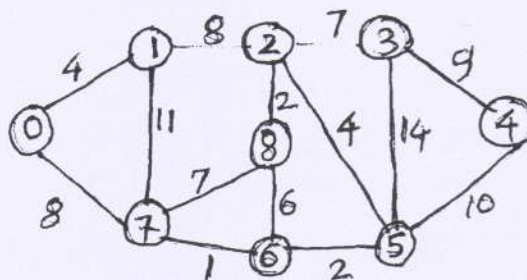
Q.3 Solve the travelling salesman problem for the given graph using dynamic programming approach. [10]



OR

Q.3 What is meant by backtracking? Write a recursive and non-recursive procedure for backtracking. [10]

Q.4 For the following graph find the shortest path using Dijkstra's algorithm. [10]



P.T.O.

OR

- Q.4 What is B tree? Write application of B tree. Insert following keys in a B tree of order 5: [10]
40, 35, 70, 22, 89, 99, 12, 1, 32, 22, 55, 78, 82, 29, 41, 8, 14.
- Q.5 What is the Cook theorem in Computer Science? Which NP-complete problem is proved by Cook? Elaborate it. [10]

OR

- Q.5 Write the difference between NP complete and NP-hard problems. Explain the relationship between class P, NP, NP-complete and NP hard problem with example of each class. [10]
- Q.6 What is parallel algorithm? How does parallel algorithm solve a problem? Explain with suitable example. [10]

OR

- Q.6 What are the advantages and disadvantages of approximation algorithm? Explain randomized algorithm with suitable example. [10]

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