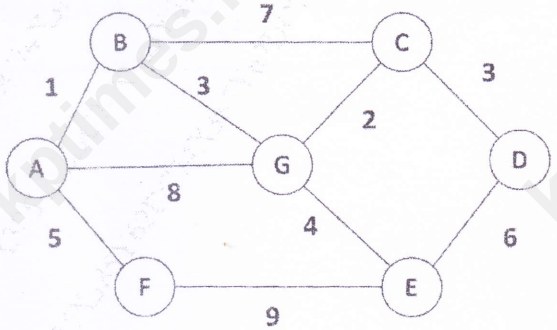
SE Sem III (NEP – 2020) Computer Dec 2025
CS-IOT & AIDS
QP code - 99073 Date 8/12/2025

Duration: 2 hours **Marks: 60**

1/2

Note: 1) Question No. 1 is **Compulsory**.
2) Attempt any **THREE** questions out of the remaining FIVE.
3) All questions carry equal marks.
4) Figures to the right indicate full marks.

			Marks
Q1)		Answer the following (**Any five**)	
	a)	Find the complexity of given recurrence relation using Master Method $T(n) = 8T(n/2) + n^2$	**03**
	b)	Write an algorithm for Binary Search	**03**
	c)	Explain the general method of the Greedy Approach.	**03**
	d)	Explain the Principle of Optimality as applied to Dynamic Programming.	**03**
	e)	Differentiate between Backtracking and Branch & Bound techniques.	**03**
	f)	Explain the Naive String-Matching Algorithm.	**03**
Q2)	**a)**	Sort the following numbers using the Selection Sort, and show the array after each pass: 28, 17, 20, 75, 13, 15	**05**
	b)	Write an algorithm for Merge Sort. Derive its time complexity. Sort the following elements using Merge Sort 32, 55, 17, 48, 64, 26	**10**
Q3)	**a)**	Explain Big Theta (Θ) notation with a suitable example.	**05**
	b)	What is Minimum Cost Spanning Tree? Write Kruskal's algorithm and state its time complexity. Find Minimum Cost Spanning Tree for following graph using Kruskal's Algorithm	**10**



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Q4) a) Consider a Knapsack with capacity W = 16. There are six items with following weights and profits. 05

(P1, P2, P3, P4, P5, P6) = (10, 5, 15, 7, 6, 18)

(W1, W2, W3, W4, W5, W6) = (2, 3, 5, 7, 1, 4)

Find the maximum profit using Fractional Knapsack algorithm

b) Write an algorithm to find Longest Common Subsequences between two given strings. Derive its time complexity. 10

Find the LCS between following strings

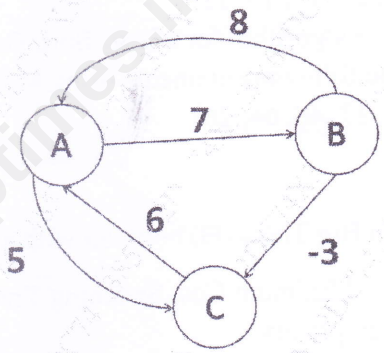
X = AVANTIKA

Y = KARNAVATI

Q5) a) What is Multistage Graph? Explain Forward Approach method to find optimal path in Multistage Graph. 05

b) What is the N-Queen Problem? Design a backtracking algorithm to solve it Provide step-by-step working of it using suitable example. 10

Q6) a) Find the All-Pair Source Shortest path for all the vertices using Floyd-Warshall Algorithm 05



b) Explain Graph Coloring method with suitable example 05

c) Write Rabin Karp String Matching Algorithm. State its time complexity. 05

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