Subject Code: ACSE-0401

03 Roll No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course B.Tech **Branch Computer Science & Engg.**

Semester IV **Examination PUT** **Year- (2021-22)**

Subject Name: Design & Analysis of Algorithms **Max. Marks:60**

Time: 2:00 Hrs

General Instructions:

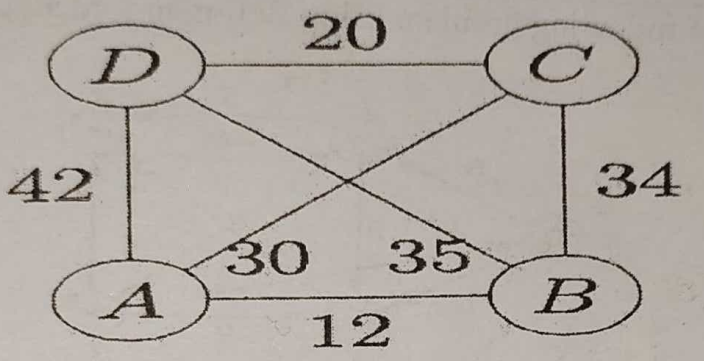
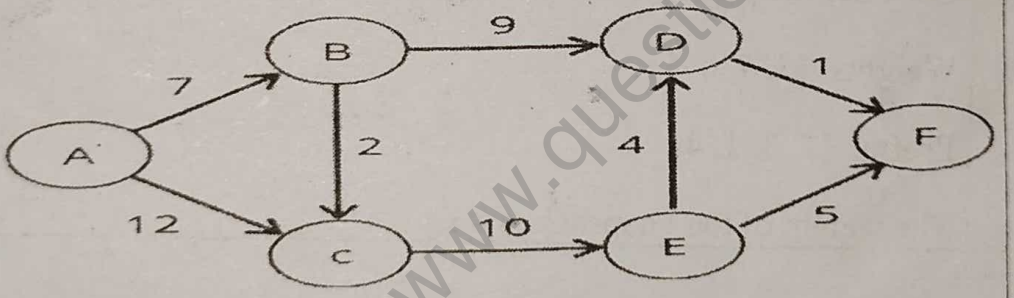
1. This Question paper consists of 3 pages & 4 questions. It comprises of three Sections -A, B, & C.
2. *Section A* –Q.No- 1 is Very short answer type questions carrying 1 mark each, Q. No- 2 is short answer type Question carrying 2 mark each. You are expected to answer them as directed.
3. *Section B*- Q.No-3 is Short answer type questions carrying 5 marks each. Attempt any four out of five questions given.
4. *Section C*- Q. No-4 is Long answer type questions carrying 6 marks each. Attempt any four out of six questions given.

SECTION – A

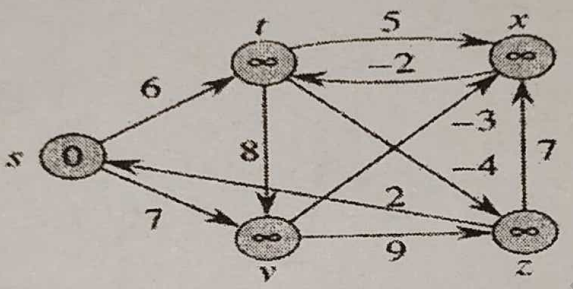
			[8x1=08]	
1.	**Attempt all parts**			
	1-a.	Define Approximation algorithm.	(1)	CO5
	1-b.	Define Greedy approach.	(1)	CO3
	1-c.	Define B-tree.	(1)	CO2
	1-d.	Define Dynamic programming.	(1)	CO4
	1-e.	Define Branch & Bound.	(1)	CO3
	1-f.	Define Optimal solution.	(1)	CO4
	1-g.	Define Minimum Spanning tree.	(1)	CO3
	1-h.	Define Backtracking.	(1)	CO4
			[4×2=08]	
2.	**Attempt all parts**			
	2-a.	Write down the difference between BFS & DFS.	(2)	CO4
	2-b.	Write down the properties of Binomial Tree.	(2)	CO2
	2-c.	Write down the properties of B-tree.	(2)	CO2

	2-d.	Write down the properties of Red-Black tree.	(2)	CO2

SECTION –B

3.	**Attempt any four out of five questions-**		[4x5=20]	
	3-a.	Explain Longest common subsequence(LCS) problem. Solve the following problem:- X= ABCXYZAY and Y= XYZABCB	(5)	CO4
	3-b.	Explain sum of subset problem. Solve the following problem: - Input: The Set: {10, 7, 5, 18, 12, 20, 15} The sum Value: 35	(5)	CO4
	3-c.	Explain Travelling salesman problem. Solve the below problem using branch & Bound method. 	(5)	CO4
	3-d.	Explain Dijkstra's single source shortest path algorithm. Solve the below problem using Dijkstra's algorithm: - 	(5)	CO3
	3-e.	Every Red Black Tree with n nodes has height <= $2\text{Log}_2(n+1)$	(5)	CO2

SECTION – C

4.	**Attempt any four out of six questions-**		**[4×6=24]**	
	4-a.	Solve the following string matching problem using Rabin-karp matcher:- Working modulo q = 11, how many spurious hits does the Rabin-Karp matcher encounter in the text T= 3141592653589793 when looking for the pattern P = 26.	**(6)**	**CO5**
	4-b.	Solve the following problem of string matching using KMP algorithm:- T=ababcabcababababd and pattern p= ababd	**(6)**	**CO5**
	4-c.	Explain all pair shortest path algorithm with any example.	**(6)**	**CO4**
	4-d.	Solve the following problem using Bell-man ford algorithm: - 	**(6)**	**CO3**
	4-e.	Explain N-queen problem with help of example.	**(6)**	**CO4**
	4-f.	Solve the following problem using 0/1 Knapsack problem: - Consider the problem having weights and profits are: Weights: {3, 4, 6, 5} Profits: {2, 3, 1, 4} The weight of the knapsack is 8 kg	**(6)**	**CO4**