| PRN No. | | PAPER CODE | V 313-212-ESF |

December 2023 (ENDSEM) EXAM

TY (SEMESTER - I)

Branch: Artificial Intelligence & Data Science

COURSE NAME: Design and Analysis of Algorithm   **COURSE CODE:**   **ADUA31202**

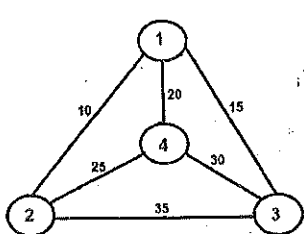**(PATTERN 2020)**

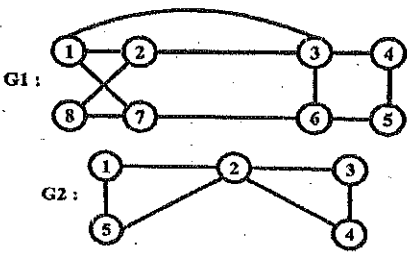Time: [1Hr. 30 Min]   [Max. Marks: 40]

(*) Instructions to candidates:
1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any one sub question from Question 3 and any two sub questions each from Questions 4,5 and 6 respectively.**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Arrange the following time complexities in ascending order. N^2 , 2^n, nlogn, logn, n^3, n, n8, (n^2-n+1)	[2]	1	Understanding
Q2	a) Analyze quick sort algorithm with its time complexity.	[2]	1	Apply
Q3.	a) Solve the following TSP problem using Dynamic programming. b) Compare the following 1) Greedy method and Dynamic programming 2) Divide and Conquer and Dynamic programming	[6] [6]	2 2	Apply Analyze
Q.4	a) What is backtracking? Discuss sum of subset problem with the help of an example. b) Define Hamiltonian cycle. Check whether the Hamiltonian cycle exists for the graph given below.	[5] [5]	2 2	Apply Analyze

G1 :

G2 :

	c) solve 0/1 knapsack problem by using Backtracking method and draw state space tree with all possible solutions. Suppose that n = 4, W = 16, and we have the following: P(40,30,50,10) and W(2,5,10,5)	[5]	2	Analyze
Q.5	a) Differentiate between Backtracking and Branch and Bound.	[5]	2	Analyze
	b) Explain Least cost search with example.	[5]	2	Apply
	c) Write control abstraction of LC search.	[5]	3	Apply
Q.6)	a) Explain vertex cover algorithm with suitable example.	[5]	3	Apply
	b) Explain in brief models of parallel computing.	[5]	4	Apply
	c) Explain the relationship between P class, NP class, NP complete, NP Hard.	[5]	4	Apply