Total No. of Questions – [03] Total No. of Printed Pages: 02

G.R. No.		PAPER CODE	U321-253(ESE)

MAY 2022 (ENDSEM) EXAM

T.Y. INFORMATION TECHNOLOGY (SEMESTER - II)

COURSE NAME: DESIGN AND ANALYSIS OF ALGORITHMS

COURSE CODE: ITUA32183

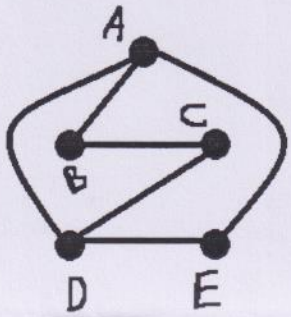
(PATTERN 2018)

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

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data where ever required**

Q.1 a) Find all Hamilton path for given graph. Construct the state space tree. [4]



b) Find all 3-colors of a graph with undirected connections v1→v2, v1→v3, v1→v4, v2→v3, v2→v4, v2→v5, v3→v4, v4→v5 using backtracking technique. [6]

OR

b) Give the statement of sum –of subsets problem. Find all sum of subsets for n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.Construct the portion of the state space tree [6]

Q.2 a) What is branch & bound? Explain the role of bounding function in it using LC – search. [4]

b) Give the formulation of modified knapsack problem using branch and bound and find the optimal solution using least cost branch and bound with n=4, m=15, (p1...p4) = (15 15 17 23), (w1...w4) = (3 5 6 9). Construct portion state space tree. [6]

OR

b) Solve the Travelling Salesman problem for given graph using branch and bound algorithms. Construct state space tree. [6]

∞	5	1	10
1	∞	4	12
3	6	∞	4
7	1	3	∞

Q.3 a) With the help of clique problem distinguish between decision problem and optimization problem. [4]

b) Prove that Clique Decision problem is NP-Complete using SAT problem? [6]

OR

b) With the help of Linear search algorithm distinguish between Non-deterministic algorithm and Deterministic algorithm. [6]