Reg. No.												

Question Paper Code	11611

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Fifth Semester

Computer Science and Business Systems

20CBPC502 - DESIGN AND ANALYSIS OF ALGORITHMS

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level,CO
1.	Illustrate any two characteristics to predict the performance of an algorithm.	2,K1,CO1
2.	What are the various types of problems that can be solved using algorithms?	2,K1,CO1
3.	What do you meant by Greedy method?	2,K1,CO2
4.	Define backtracking and list any two applications using this methodology.	2,K1,CO2
5.	Why we need to traversal the node in tree? Define the types.	2,K2,CO3
6.	How to decide whether the given tree is spanning tree? Write the formula used to find the number of spanning tree possible with n node.	2,K2,CO3
7.	Write any one theorem defined by Stephen cook.	2,K2,CO4
8.	List the differences between P and NP Problems.	2,K1,CO4
9.	What is the main usage of approximation algorithm?	2,K1,CO5
10.	Predict and analysis reduction techniques in real cases.	2,K1,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

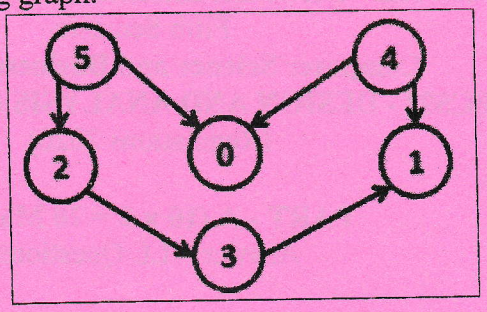
11.	a)	Discuss about Asymptotic analysis of Complexity Bounds with Best, Average and Worst Case behavior in any one algorithm.	13,K2,CO1
		OR	
	b)	Describe the time and space complexity required for Matrix multiplication with tabular explanation.	13,K1,CO1
12.	a)	Write down the steps involved in knapsack problem. Consider the problem having weights and profits as: Weights: {3, 4, 6, 5} Profits: {2, 3, 1, 4} The weight of the knapsack is 8 kg. Stimulate the solution using Greedy approach.	13,K1,CO2
		OR	
	b)	Elaborate about Travelling Salesman problem with neat sketch.	13,K3,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

13. a) Explain about DFS and BFS algorithm with an example. *13,K2,CO3*

OR

b) Write an algorithm for Topological sorting and apply the method to sort the following graph. *13,K2,CO3*



14. a) Write note on P, NP, NP-complete and NP-hard. *13,K2,CO4*

OR

b) Describe about Cook's theorem and prove it. *13,K1,C*

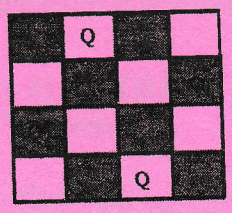
15. a) Briefly explain about approximation algorithm. *13,K2,CO5*

OR

b) Discuss about the applications of Quantum Algorithms. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Use case: Illustrate backtracking algorithm and find the solution for 4*4 Queen problem tree construction with step by step procedure, the solution must look like: *15,K3,CO2*



OR

b) Construct minimum cost spanning tree for the given graph using any one of the greedy method. *15,K3,CO3*