



**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY
KASABA BAWADA KOLHAPUR-416006**

(An Autonomous Institute)
T. Y. B. Tech (CSE), Sem-V

Q. Paper Code: 22CSE301501
Set:- I

END SEMESTER EXAMINATION(ESE), Nov. – 2022

Course Name: **Design and Analysis of Algorithms** Course Code: **201CSL301**

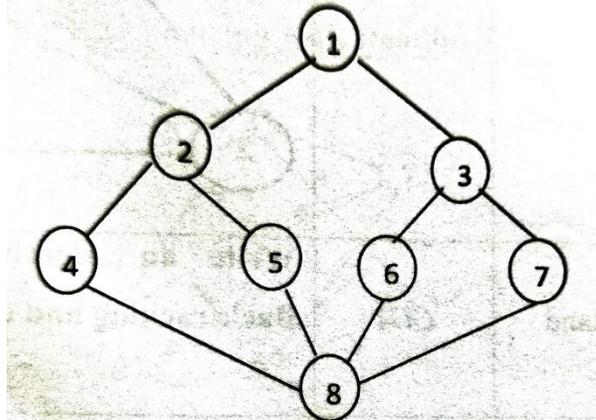
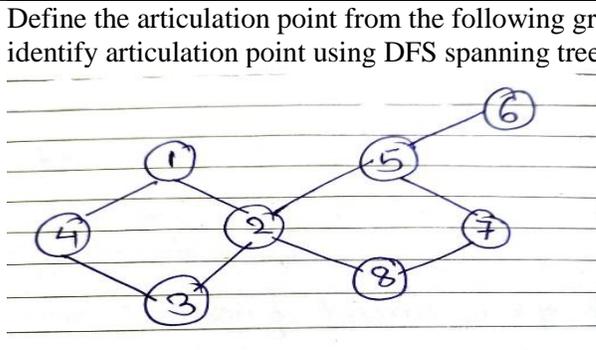
Day and Date: Monday, 05.12.2022
Time: 2.00 pm to 4.00pm

Seat No:

Max. Marks- 50

Instructions:

i. Figure to the right indicate full marks.

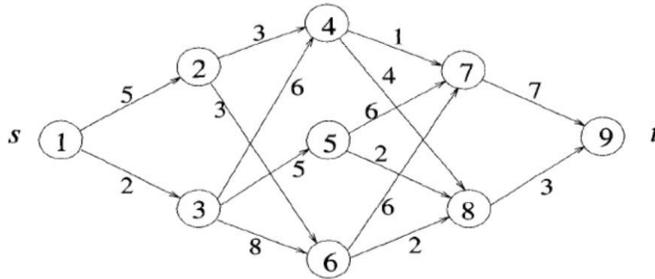
BT	CO's	Q. No.		Marks
		Q.1	All Questions are compulsory	20
3	CO1, CO2	a	Write an algorithm for the min-max problem using the divide-and-conquer approach. Show that its time complexity is $O(3n/2)$.	6M
3	CO1	b1	What is the solution generated by job sequencing when $n=7$, $(p_1 \dots p_7)=(3,5,20,18,1,6,30)$ and $(d_1 \dots d_7)=(1,3,4,3,2,1,2)$?	4M
		b2	Explain the greedy approach and its control abstraction.	3M
3	CO1	c	Explain the graph coloring problem using the backtracking approach. Write its algorithm.	7M
		Q.2	All Questions are compulsory.	10
4	CO3	a	What data structures are used to implement BFS and DFS? Apply BFS traversal to the given graph. Also, identify and mention whether the graph is connected or not. 	4
4	CO3	b	Define the articulation point from the following graph and identify articulation point using DFS spanning tree. 	6

2		OR	Describe traversal techniques for graphs with algorithms.	
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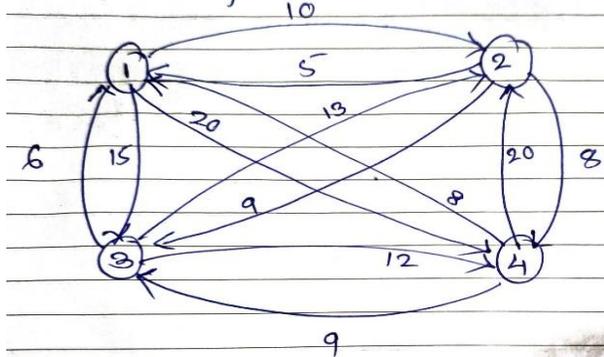
4	CO3	a	Solve the following instance of knapsack 0/1 problem where $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ and $(p_1, p_2, p_3, p_4) = (2, 5, 8, 1)$ where knapsack capacity $m = 11$.	3
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4	CO3	b	Find the minimum cost path from s to t in the multistage graph using the forward approach.	7
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OR

Solve the following problem on the Travelling Salesperson problem with 1 as the source node.



10

2	CO4	a	Define P and NP problems. Explain relationship between P, NP, NP complete and NP hard problems with neat diagram.	5
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2	CO4	b	Explain Clique decision problem and show that Clique decision problem is NP-Hard.	5
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2	CO4	c	Explain AND/OR graph decision problem.	5
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