KOLHAPUR INSTITUTE OF TECHNOLOGY'S,
COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR
(AFFILIATED TO SHIVAJI UNIVERSITY, KOLHAPUR)

T.Y. B.Tech. (Computer Science & Engineering)
(Semester- V)
END SEMESTER EXAMINATION, DECEMBER- 2021

Course Code : UCSE0501

Course Name : Computer Algorithms

Day and Date : Thursday , 23-Dec-21

Time : 09:30 AM To 11:30 AM

PRN :

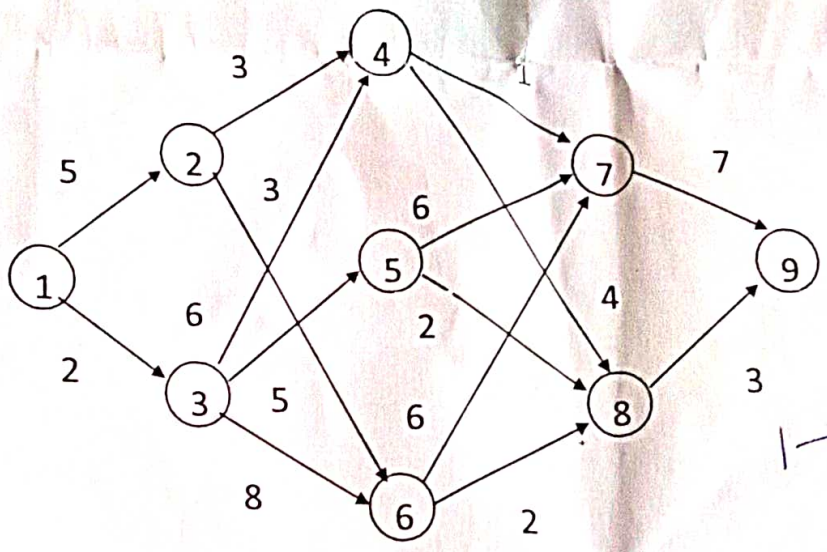
Max Marks: 50

Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

i) All questions are compulsory.
ii) Figure to the right indicate full marks.
iii) Assume suitable data wherever necessary.

		Marks	B.L	CO's
Q.1	**Attempt any Two**	**16**		
A		**8**	1	3



1→3→5→8→9

12

Find minimum cost of path from S-T is the multistage graph of following figure. Use both forward and backward reference method.

d(1,9) = min{5 + d(2,9), 2 + d(3,9)} = {5+8, 5+11} = 13

d(2,9) = min{3 + d(4,7), 3 + d(6,7)} = {3+4+3, 3+1+7} = {10}

d(4,9) = min{1 + d(7,9), 4 + d(8,9)} = {1+

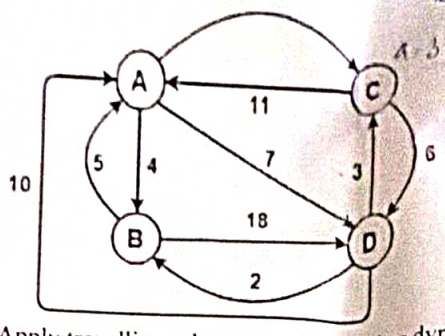
12

B Solve the following recurrence relation 8 3 1

1. $T(n) = 4T(n/2) + n^2$
2. $T(n) = 3T(n/2) + n^2$

Using Master theorem.

C 12

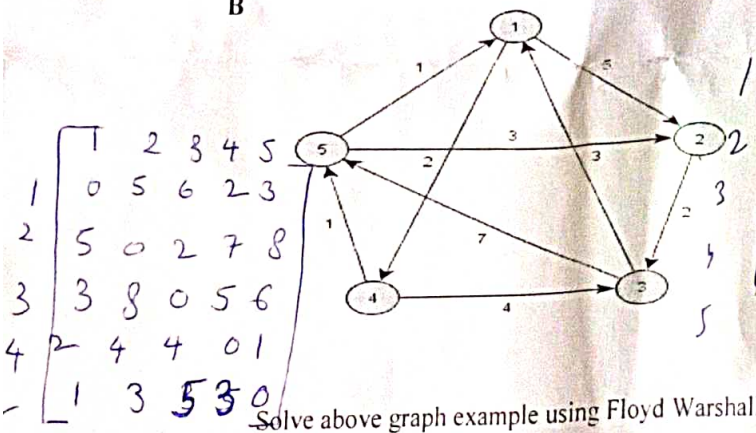


Apply travelling salesman problem using dynamic programming, discuss algorithm and complexity.

Q.2 Attempt any two 16

A Consider 5 items with their respective weights and profits, weights=<5,10,20,30,40> and profits=<30,20,100,90,160>. The capacity of knapsack M=60.Find the solution using greedy method to the fractional knapsack. 8 1 3

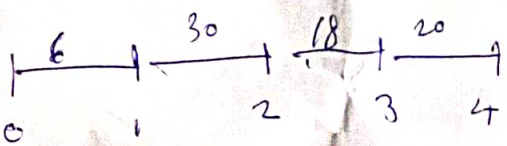
B



	1	2	3	4	5
1	0	5	6	2	3
2	5	0	2	7	8
3	3	8	0	5	6
4	2	4	4	0	1
5	1	3	5	3	0

Solve above graph example using Floyd Warshall's all pair shortest path algorithm. 8 3 3

C What is the solution generated by greedy solution to job sequencing with deadline problem when n=7
(P1,...P7)=(3,5,20,18,1,6,30) (d1..d7)=(1,3,4,3,2,1,2)



p	d
3	1
5	3
20	4
18	3
1	2
6	1
30	2

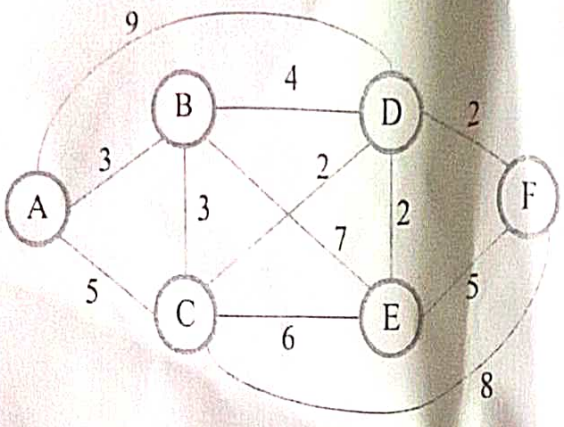
Q.3 Attempt any two

A Solve following optimal BST problem using dynamic programming method

Sr. No	0	1	2
Keys	10	12	20
Access Time (Frequency)	34	8	50

9 3 3

B Solve given graph problem with the help of Dijkstra's single source shortest path algorithm.



9 3 3

C Solve graph coloring problem for n=3 (nodes) and m=3 (color) using backtracking. Explain using state space search tree.

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