

		Register Number	2	1	C	3	R	0	1	4
VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY										
(An Autonomous Institution, Affiliated to Anna University, Chennai)										
Continuous Assessment Test - II					QP Set	1	Regulations-2018			
Programme	B.Tech. IT & BE CSE		Semester:	4	Max. Marks:	60	Duration	2.0 Hrs		
Course Code & Title:		21ITT42 & Design and Analysis of Algorithm								
Class:21IT4A&B		Date: 16.05.2023(FN)			Time: 10.30 am – 12.30 pm					
Knowledge Levels (KL)	K1 – Remembering			K3 – Applying			K5 – Evaluating			
	K2 - Understanding			K4 – Analysing			K6 – Creating			

Part A – 12x2 = 24 Marks

- | | | | |
|-----|--|-----|----|
| 1. | State the application of Huffman's tree? | CO3 | K1 |
| 2. | What is Knapsack problem using greedy approach? | CO3 | K1 |
| 3. | Write the general procedure of dynamic programming. | CO4 | K2 |
| 4. | What is the formula for binomial coefficient? | CO4 | K1 |
| 5. | What is transitive closure? | CO4 | K1 |
| 6. | Define Optimal binary search tree. | CO4 | K1 |
| 7. | List out the memory functions under dynamic programming. | CO4 | K1 |
| 8. | What are the applications of backtracking? | CO5 | K1 |
| 9. | Differentiate explicit and implicit constraints. | CO5 | K4 |
| 10. | Why 2 queens problem is not solvable? Justify your answer. | CO5 | K1 |
| 11. | What is the principle behind branch and bound technique? | CO5 | K1 |
| 12. | Define P and NP Problem. | CO5 | K1 |

Part B – 3x12 = 36 Marks

- | No. | Question | Marks | CO | KL |
|-----|---|-------|-----|----|
| 13. | (a) Explain Huffman's algorithm. Construct Huffman's tree for the following data and let $A = \{l/119, m/96, c/247, g/283, h/72, f/77, k/92, j/19\}$ be the letters and its frequency of distribution in a text file. Compute a suitable Huffman coding to compress the data effectively. | 12 | CO3 | K3 |
| OR | | | | |
| | (b) Identify the knapsack instance $n=7, M=15, (P_1, P_2, P_3, \dots, P_7) = (10, 5, 15, 7, 6, 18, 3)$ and $(w_1, w_2, w_3, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$. | 12 | CO3 | K3 |

14. (a) (i) Solve the all pair shortest path problem for the digraph with the weight matrix given below:-

0	2	∞	1	8
6	0	3	2	∞
∞	∞	0	4	∞
∞	∞	2	0	3
3	∞	∞	∞	0

8 CO4 K3

- (ii) Write an pseudo code for the solution to the problem that expect to satisfy the transitive closure properties to transform the adjacent matrix to path matrix.

4 CO4 K2

OR

- (b) (i) Obtain a optimal binary search tree for following nodes(do, if, int, while) with following probabilities(0.1,0.2,0.4,0.3).

7 CO4 K3

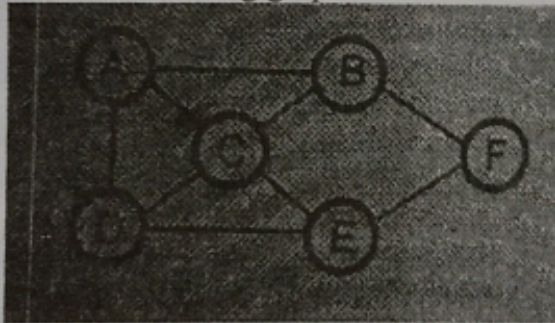
- (ii) Write the algorithm to compute the 0/1 knapsack problem using dynamic programming and explain.

5 CO4 K2

15. (a) (i) Using backtracking enumerate how can you solve the following problem 4 queens problem.

6 CO5 K3

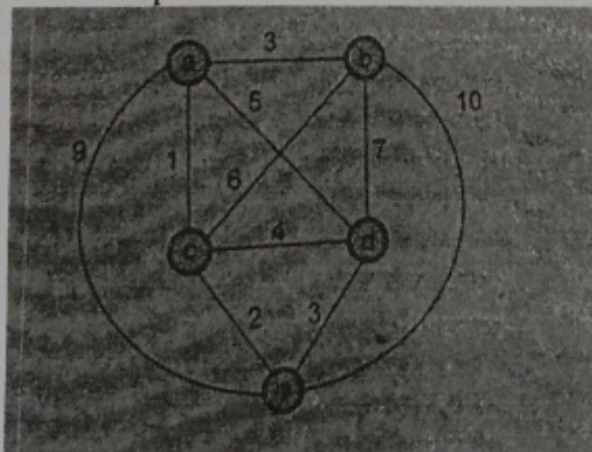
- (ii) For the following graph solve the Hamiltonian cycle.



6 CO5 K3

OR

- (b) Apply branch and bound algorithm to solve the travelling salesman problem for



12 CO5 K3