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CMR INSTITUTE OF TECHNOLOGY, BENGALURU
ACCREDITED WITH A+ GRADE BY NAAC

Internal Assessment Test III – Jan 2020

Sub:	Design and Analysis of Algorithms					Code:	18MCA33
Date:	14 -1-20	Duration:	90 mins	Max Marks: 50	Sem: III	Branch:	MCA

Note: Answer any full 5 questions. All questions carry equal marks.   Total marks: 50
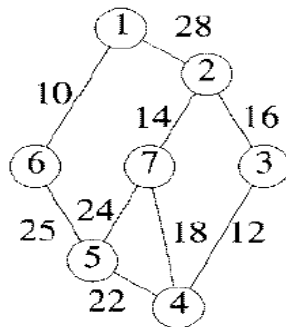
	Marks	OBE CO	OBE RBT
1. Explain the various stages of the algorithm design and analysis process with the help of a flowchart.	10	CO1	L1 L2
(OR)			
2. Explain the methods to analyze recursive and non-recursive algorithms with examples	10	CO2 CO3 CO4	L2 L3 L4
3. Find the minimum cost spanning tree for the given graph below by applying Prim's and Kruskal's algorithm. Write the algorithm and compute minimum cost .	10	CO2 CO3 CO4	L2 L3 L4

(OR)

	Marks	OBE CO	OBE RBT
4. Solve the assignment problem using branch and bound technique.	10	CO2 CO3 CO4 CO6	L3 L4

Job → 1 2 3 4   person ↓

$$\begin{bmatrix} 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{bmatrix} \begin{matrix} a \\ b \\ c \\ d \end{matrix}$$
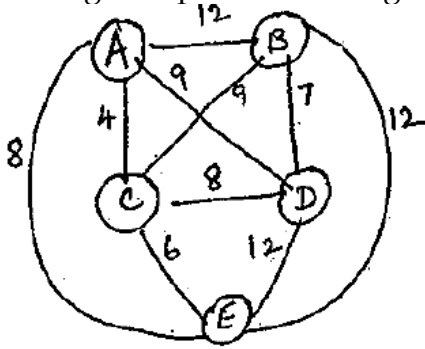
	Marks	OBE CO	OBE RBT
5. Describe the Johnson Trotter and Lexicographic Permutation methods for generating combinations of numbers. Demonstrate it to generate all permutations of the numbers 1-4 i.e { 1,2,3,4}.	10	CO2 CO3 CO4 CO6	L3 L4

(OR)

#	Question	Marks	CO	L
6.	Draw state space tree of branch-and-bound technique to find optimal tour for travelling salesperson for the given graph. 	10	CO2 CO3 CO4 CO6	L3 L4
7	Using decision tree show the time complexity for successful and unsuccessful search. Also Give the binary decision tree for binary search in a four element array and give the worst case comparison made by binary search. (2014)	10	CO2 CO3 C04	L3 L4
8	Using backtracking solve sum of subsets problem for the following instance n=5, d=9, set S= { 1,2,5,6,8}.	10	CO2 CO3 CO4 CO6	L3 L4
9	What are decision trees? Explain with example, how decisions trees are used to prove lower bound of sorting problem. **(OR)**	10	CO2 CO3 CO4 CO6	L3 L4
10	Explain backtracking. Describe the 4-queen's problem and discuss the possible solution . Draw state space tree.	10	CO2 CO3 CO4	L3 L4