

**Questions:****PART-A (Multiple Choice / Fill in the Blanks / Match the Following / Short Answer Type Questions)**

			<b>CO#</b>	<b>BL#</b>	<b>Marks</b>
1.	a) Worst case time complexity of quick sort is.....		CO1	BL1	1 M
	b) Define an algorithm		CO1	BL1	1 M
	c) Performance of an algorithm is depends on..... and .....		CO1	BL2	1 M
	d) Prove that $3n+2 = \Theta(n)$		CO1	BL2	1 M
	e) Define Theta notation.		CO1	BL2	1 M
	f) What are the applications of greedy approach		CO2	BL1	1 M
	g) Kruskal's algorithm is ..... method		CO2	BL1	1 M
	h) Discuss knapsack problem		CO2	BL1	1 M
	i) Given a weighted graph where weights of all edges are unique then there is always a unique shortest path from source to a destination (True / False)		CO2	BL1	1 M
	j) Define minimal cost spanning tree.		CO2	BL1	1 M

**PART-B (Descriptive Questions)**

2. Solve the recurrence relation using Substitution Method

$$T(n) = \begin{cases} 1, & n=1 \\ 2T(n/2) + n, & n>1 \end{cases}$$

CO1 BL2 5 M

3. Sort the given list using merge sort
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- [50, 25, 6, 20, 60, 30, 90, 10]

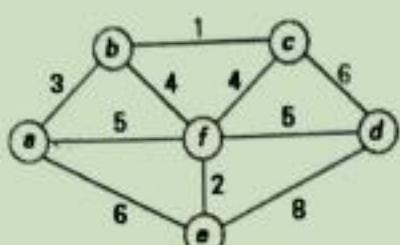
CO1 BL3 5 M

4. Write an algorithm to find out the maximum and minimum of array elements

CO1 BL2 5 M

using divide and conquer method. Derive its time complexity.

5. Calculate the minimum cost spanning tree of the following graph using Prim's algorithm.

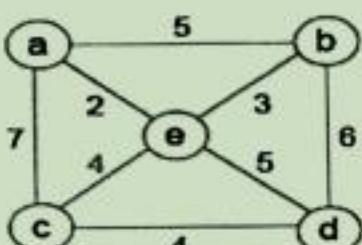


CO2 BL3 5 M

6. Write an algorithm for the job sequencing problem using greedy approach.

CO2 BL2 5 M

7. Apply the Dijkstra's algorithm to the following graph to find the single source shortest path. Consider vertex 'a' as the source vertex.



CO2 BL3 5 M