**Questions:**

| | | | CO# | BL# | Marks |
|---|---|---|---|---|---|
| 1. | a) | Worst case time complexity of quick sort is.............. | CO1 | BL1 | 1 M |
| | b) | Define an algorithm | CO1 | BL1 | 1 M |
| | c) | Porformance of an algorithm is depends on.............. and ............ | CO1 | BL2 | 1 M |
| | d) | Prove that 3n+2=Θ(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)**
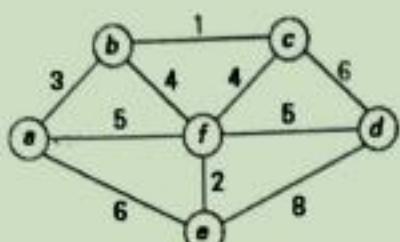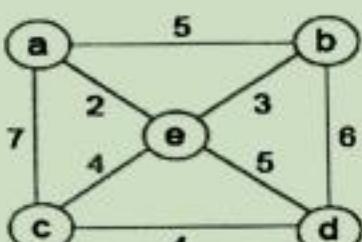
| | | CO# | BL# | Marks |
|---|---|---|---|---|
| 2. | Solve the recurrence relation using Substitution Method $$T(n) = \begin{cases} 1, & n=1 \\ 2T(n/2)+n, & n>1 \end{cases}$$ | CO1 | BL2 | 5 M |
| 3. | Sort the given list using merge sort [50, 25, 6, 20, 60, 30, 90, 10] | CO1 | BL3 | 5 M |
| 4. | Write an algorithm to find out the maximum and minimum of array elements | CO1 | BL2 | 5 M |

| | | CO# | BL# | Marks |
|---|---|---|---|---|
| | 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 |