Exam.Code:0925
Sub. Code: 6458

2074

B. E. (Information Technology)

Seventh Semester

OEIT-701: Competitive Programming

Time allowed: 3 Hours

Max. Marks: 50

***NOTE**: Attempt <u>five</u> questions in all, including Question No. I which is compulsory and selecting two questions from each Part.*

x-x-x

1. Attempt the following:-

   a) What are the different ways to measure the time complexity of any algorithm?

   b) Define dynamic programming.

   c) How is BFS computationally efficient than DFS?

   d) Define maxflow problem.

   e) Give one real world application of Binary Search. (5x2)

PART-A

2.

   a) How is Reversort different from Trouble Sort? Explain with suitable example. **(8)**

   b) What will be the cost of 2nd iteration of Reversort for [5, 2, 6, 8, 9, 7, 4, 3, 1] ? **(2)**

3. How is greedy approach helpful in solving the partial knapsack problem (for maximizing the value) considering the following data and maximum capacity is 20: **(10)**

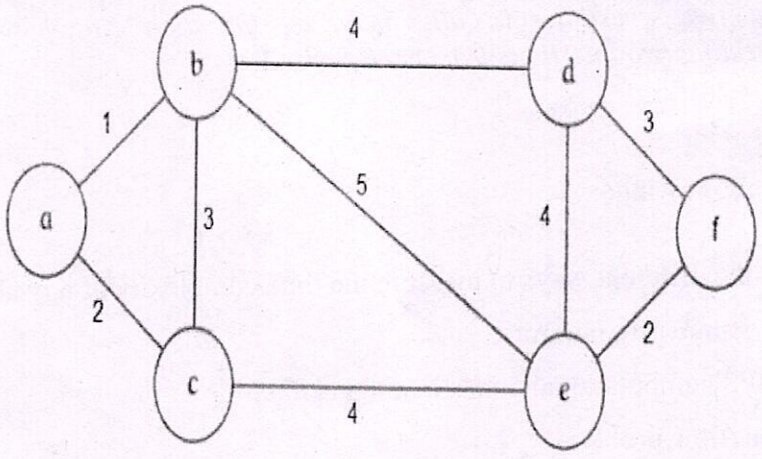
Item	Weight (W)	Value(V)
1	10	25
2	7	53
3	2	40
4	6	16
5	9	56

4. Explain the problem of disjoint set union with suitable example. **(10)**

P.T.O.

PART-B

5. Consider the graph G given below.

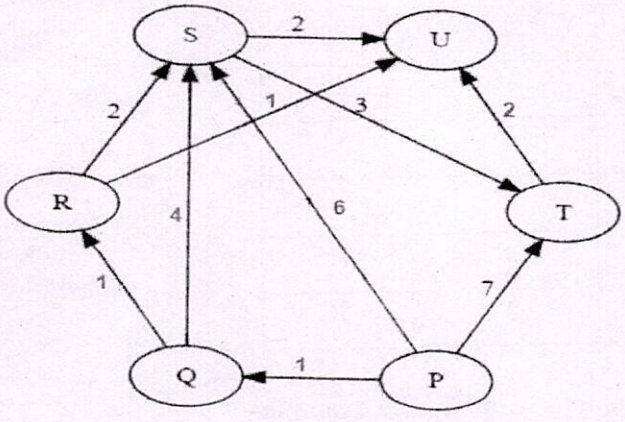


Find out all possible minimum spanning trees of **(10)**

6. What is dynamic programming? Is jumping Frog follows top-down or bottom-up dynamic programming approach? What will be the minimum possible cost for the following sequence of height of stones?

10, 27, 11, 25, 26, 11, 38, 15, 30, 41, 27, 38 **(10)**

7. For the following graph, apply Dijkstra's algorithm to find the shortest path from node P to all other nodes.



(10)

x-x-x