DARSHAN INSTITUTE OF ENGINEERING AND TECHNOLOGY, RAJKOT

Mid Semester Exam– I (August, 2019)

B.E. Sem.-V (Computer Engineering)

Enroll. No.:_____

Subject: 2150703 - ADA - Analysis and Design of Algorithms **Date: 14/08/2019**

Time : 08:00 a.m. to 10:00 a.m. **Total Marks : 42**

Instructions: 1. Attempt All Questions.

2. Assume suitable data if necessary.

3. Figure to the right indicate full marks.

Q.1 Attempt any three questions.

1. Define (i) Algorithm (ii) Quantifiers and (iii) Equivalence Relation. **(3)**
2. Using greedy algorithm find an optimal schedule for the following jobs. **(3)**
   Profits: ($P1$, $P2$, $P3$, $P4$, $P5$, $P6$) = (60, 100, 20, 40, 20, 30)
   Deadline: ($d1$, $d2$, $d3$, $d4$, $d5$, $d6$) = (2, 1, 4, 2, 1, 3)
3. Apply counting sort on the following numbers to sort in descending order. **(3)**
   4, 3, 1, 5, 7, 0, 1, 3, 0.
4. Find an optimal Huffman code for the following set of frequency. **(3)**
   a : 50, b : 25, c : 15, d : 30, e : 7, f : 12

Q.2 Attempt any three questions.

1. Explain Dijkstra algorithm with example to find the shortest path. **(4)**
2. What is an amortized analysis? Explain any two techniques of it. **(4)**
3. Sort the given elements with Heap Sort Method: 34, 18, 65, 32, 51, 21. **(4)**
4. Briefly describe the commonly used asymptotic notations. **(4)**

Q.3 Attempt any three questions.

1. List applications of a minimum spanning tree. Find minimum spanning tree using Kruskal's algorithm for the graph given in Figure 1. **(7)**
2. Define minimum spanning tree. Find minimum spanning tree using Prim's algorithm for the graph given in Figure 1. **(7)**
3. Discuss selection sort algorithm with its time complexity and example. **(7)**
4. Consider Knapsack capacity W=20, w = (25, 24, 15) and v = (18, 15, 10) find the maximum profit using greedy approach. **(7)**

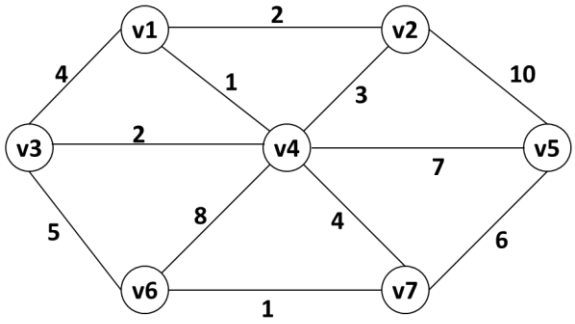

Figure 1

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