

**B.TECH SEM – V (2007 COURSE) (INF. TECH.) : SUMMER -  
2018**

**SUBJECT: ADVANCED DATA STRUCTURES**

Day: **Monday**  
Date: **21/05/2018**

**S-2018-2674**

Time: **10.00 AM TO 01.00 PM**  
Max Marks: 80

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**N.B.:**

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt questions **ANY TWO** questions from each section.
  - 2) Answer to both the section should be written in **SEPARATE** answer book.
  - 3) Figure to the right indicates **FULL** marks.
  - 4) Assume suitable data if necessary.
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**SECTION – I**

- Q.1**
- a) What is ADT? Give ADT for a stack. **(05)**
  - b) Explain the relationship between Data Structure and algorithm in the process of problem solving with an example. **(05)**
  - c) Write the control abstraction for greedy algorithm strategy. **(04)**
- Q.2**
- a) Explain best case, average case and worst case time complexity. Give suitable example. **(07)**
  - b) Write with function for Binary Search and compute its time complexity. **(06)**
- Q.3**
- a) Write a function in 'C' to sort n integer numbers using quick sort. **(07)**
  - b) Explain how divide and conquer technique of algorithm design helps to reduce the computing complexity with suitable example. **(06)**
- Q.4**
- a) Explain the method for Huffman encoding in detail with example. **(07)**
  - b) Explain Greedy method with suitable example. **(06)**

**SECTION – II**

- Q.5**
- a) Construct an AVL tree by inserting the following elements in order to their occupancy  
64, 1, 14, 26, 13, 110, 98, 85 **(05)**
  - b) Write and explain Kruskal's Algorithm to compute minimum cost spanning tree. **(05)**
  - c) Write short note on Parallel Algorithm. **(04)**

**P.T.O.**

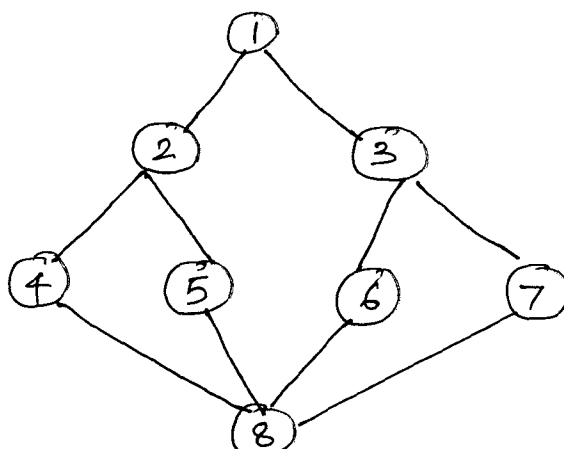
Q.6 a) Find the optimal solution to the following Knapsack Instance. (06)  
 $n = 3, m = 20, (P_1, P_2, P_3) = (25, 24, 15)$  and  $(W_1, W_2, W_3) = (18, 15, 18)$ .

b) Explain multistage graph problem with the help of suitable example. (07)

Q.7 a) What is backtracking concept of problem solving? Explain with the help of 8 queen's problem. (06)

b) Explain graph coloring problem with suitable example. (07)

Q.8 a) For the given graph below find the BFS and DFS spanning tree. (08)



b) Show various stages of Prim's Algorithm to compute Minimum Spanning Tree (06)  
 for the following example.

