Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)
GRADE IMPROVEMENT EXAMINATIONS, JAN 2021

DATA STRUCTURES & ALGORITHMS [ELE 4018]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 08 January 2021** **Max. Marks: 50**

Instructions to Candidates:

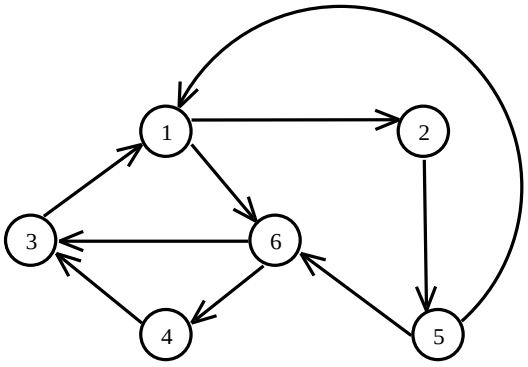
- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Solve the recurrence equation using master's theorem and determine the time complexity.

$$T(n) = \begin{cases} d; & n = 1 \\ 8T(\frac{n}{2}) + n; & n > 1 \end{cases}$$

(04)

1B. For the given graph, write the sequence for DFS(1) and BFS(3). show the reached arrays and queue after each iteration.



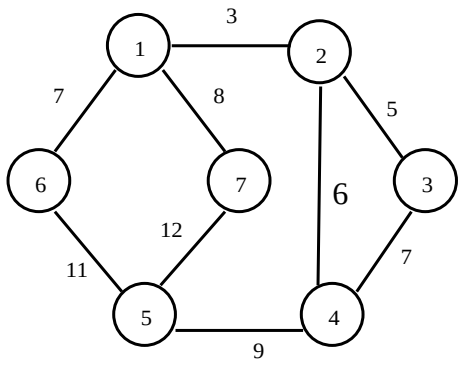
(04)

1C. List the basic differences between iteration and recursion with suitable example. ***(02)***

2A. Solve using Dynamic programming
C= 100; W=[25,35,40,60]; P= [10,12,14,20] ***(04)***

2B. Obtain MST using Kruskal's algorithm for the given weighted graph.

(04)



2C. What are the primitive data types? Give suitable examples. ***(02)***

3A. Using hash function f(x)= x mod 7, insert the following elements in the hash table; N=10

55,71,84,8,97,62,53,3,34,13

To handle the collision, make use of

i. Open hashing
ii. Linear Probing
iii. Quadratic Probing
iv. Double Hashing

(04)

3B. Write a pseudocode to initializing an array with natural numbers. Write suitable comments. ***(02)***

3C. Write a pseudocode to develop a doubly linked list. How do you delete the last node in doubly linked list. ***(04)***

4A. Write pseudocode algorithms to PUSH and POP elements to/from a STACK. ***(03)***

4B. Write a pseudo-code algorithm to evaluate a given postfix string array? Assume only +,- and * operators. ***(03)***

4C. Write a pseudocode algorithm to print the sorted list of elements contained in a Binary search tree. ***(04)***

5A. Write a pseudocode for enque and deque operations associated with Queue. ***(04)***

5B. Write a pseudo-code algorithm to merge two sorted arrays with suitable example. ***(04)***

5C. Discuss any two differences between Arrays and Linked Lists. ***(02)***