SVKM's NMIMS
MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

Programme: B.Tech/ MBA Tech (IT) Year: II Semester: III

Academic Year: 2019-20

Subject: Data Structures and Algorithms

Date: 09 November 2019

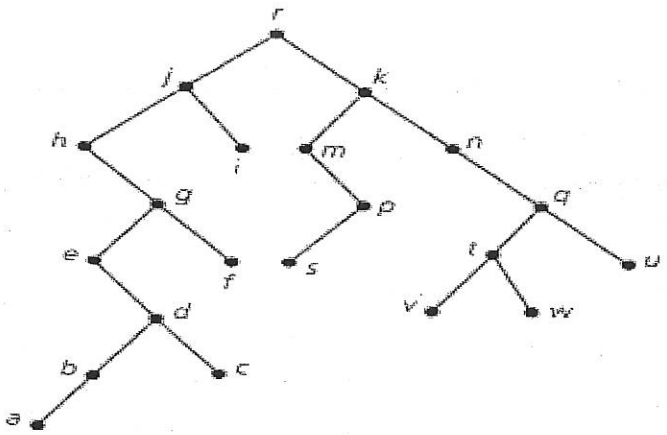
Marks: 100
Time: 2.00 pm - 5.00 pm
Durations: 3 (Hrs)
No. of Pages: 02

Final Examination (2019-20)

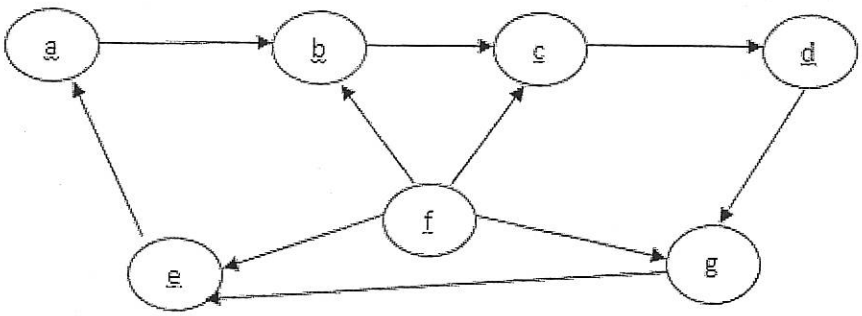
Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) **In all 5 questions to be attempted.**
4) All questions carry equal marks.
5) **Answer to each new question to be started on a fresh page.**
6) **Figures in brackets on the right-hand side indicate full marks.**
7) **Assume suitable data if necessary.**

Q1	A	Explain the term Abstract Data Types. Bring out its significance.	5
	B	What do you understand by the terms Time and Space complexity? Explain with an example.	5
	C	Suggest an efficient way to represent graphs in memory.	5
	D	Bring out the importance of garbage collection in dynamic memory allocations.	5
Q2	A	What is a Queue data structure? Write algorithms to insert and delete elements from a queue.	10
	B	Simulate the conversion of the given Infix expression to its corresponding postfix expression using a Stack data structure. a * (b + d) / e – f * (g + h / k)	10
Q3	A	Explain technique used in Greedy algorithms with an example.	10
	B	Write an algorithm to insert and delete elements from an Array data structure.	10
Q4	A	Explain a One Way and a Two way Threaded Binary tree and their advantages.	10
	B	Traverse the given Binary tree using Postorder, Preorder and Inorder traversal techniques.	10



Q5 **A** For the graph given below, simulate the Depth First Search Algorithm to find out all nodes reachable from node b, using a Stack data structure. **10**



B Explain the term Collision in Hashing? Briefly discuss any one technique to handle this with appropriate example. **10**

Q6 **A** What is the advantage of using a Linked list? Write down an algorithm for searching an element in a linked list. **10**

B Build a Heap from the following set of numbers. **10**
54,26,93,17,77,31,44,55,20,78,12,40,90,11

Q7 **Write short notes:**

A Expression tree **10**

B File as a data structure **10**