Roll No..... **Sheet No. 1** **B.Tech. 02/2019**

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
THEORY EXAMINATION

Question Paper

Month and Year of the Examination: **Dec-2019**

Programme: **B.Tech.** Semester: **2nd Sem**

Subject: **Data Structures**

Course No: **ITPC-12** Maximum Marks: **50**

Number of Questions to be attempted: **5** Time allowed: **3 Hours**

Total No. of Questions: **5** Total No. of Pages used: **2**

The candidates, before starting to write the solution, should please check the question paper for any discrepancy, and also ensure that they have been delivered the question paper of right **course no**. and **subject title**. Assume suitably and state, additional data required, if any.

Note: All Questions are Compulsory

1.	(a)Q:What do you mean by pointer? How to pass pointers in functions? (b)Q: What do you mean by dynamic memory allocation. What function or functions can be used for dynamic memory allocation. (c)Q: WAP in C language to sort n elements using Merge sort.	**3** **2** **5**
2.	(a)Q: Convert the following infix expression to its postfix form using stack. A + B – C*D/E + F. OR (a)Q: Evaluate the following prefix expression : * + 4 3 2 5 Show diagrammatically each step of evaluation using stack. (b)Q: WAP in C language to implement a stack using an array.	**5** **5**
3.	(a)Q: WAP in C program to reverse only first n elements of a Linked List (b)Q: Describe an algorithm to evaluate postfix expression using STACK. OR (b)Q: Show how to implement three stack in one array. (c)Q: Take a queue containing numbers 10, 15, 5, 25, 30 in which 30 has been inserted first. After performing the following operations, what would be the contents of the queue ? i. Delete two elements ii. Insert 7 and then 20 iii. Delete an element	**3** **3** **4**

4.	(a)Q: 'Recursion is better than iteration'. Critically comment on this statement.	3
	(b)Q: Usually a queue is implemented using two pointers, viz., front and rear. Is it possible to implement a linked queue that requires only one pointer ? If yes, how to implement it ?	3
	(c)Q: Write a recursive algorithm to count the number of elements in an array. Explain the advantages and disadvantages of using recursive formulation of an algorithm compared to non-recursive formulation.	4
5.	(a)Q: Given the following inorder and preorder traversal reconstruct a binary tree: Inorder sequence: D, G, B, H, E, A, F, I, C Preorder sequence: A, B, D, G, E, H, C, F, I	5
	(b)Q: Sort the given list using Heap Sort :66, 33, 40, 20, 50, 88, 60, 11, 77, 30, 45, 65.	5

**********End **********