BCST-303/BITT303

Roll No.

Odd Semester Examination, 2019-20
B.Tech (CSE/IT, 3rd SEMESTER)
DATA STRUCTURE

Time: 3 Hours

Max. Marks 100

Total no. of printed pages: 2

Note: All questions are compulsory.

1. Attempt *any four* parts of the following: (5 × 4 = 20)
   (a) Mention the five applications of data structure .
   (b) Explain sorting and mention its various types.
   (c) Explain underflow and overflow condition of a stack.
   (d) Differentiate between binary search and sequential search.
   (e) Construct a B tree of order 3 for the following data
   50,30,21,90,10,13,20,70,25,92,80
   (f) Define data Structure Operations (i) insertion (ii) deletion (iii) traversal

2. Attempt *any four* parts of the following: (5 × 4 = 20)
   (a) Differentiate between Linear and Non-linear data structures. Also explain the concept of time complexity.
   (b) Write a program to implement insertion sort.
   (c) Given is pre-order and post order traversal. Construct the binary tree for the same
   Pre order: A B D G H K C E F
   Post-Order: G K H D B E F C A
   (d) Construct the binary search tree using following elements :
   35,15,40,7,10,100,28,82,53,25,3.
   Show diagrammatically each step of construction of BST.
   (e) Write note on singly linked list and doubly linked list.
   (f) Explain Different Types of Queue.

3. Attempt *any two* parts of the following: (10 × 2 = 20)
   (a) What is bubble sort? How it is different from selection sort? Explain how the following list can be sorted using the bubble sort algorithm.
   13 7 9 32 76 96 100 22 88 6 17
   (b) Create a min heap for the following data:
   10, 30, 16, 12, 25, 30, 14, 2, 7.
   After creation of min heap, perform one delete operation and represent final min heap.
   (c) What is max heap. Write a function to insert an element in max heap. What is the

4. Attempt *any two* parts of the following: (10 × 2 = 20)
    (a) Explain quick sort with suitable example.
    (b) Explain basic operations that can be applied on a file. Explain indexed sequential file organisation.
    (c) Discuss the array representation of a stack. Write c function to push element into stack, to pop the stack top and to traverse the stack when it is implemented as an array.

5. Attempt *any two* parts of the following: (10 × 2 = 20)
    (a) Explain how open addressing and chaining are used to handle overflow in hashing in detail.
    (b) List the disadvantage of linear queue and explain how it is solved in circular queue. Give the algorithm to implement circular queue with suitable example.
    (c) Show the effect of PUSH and POP operation on to the stack of size 10. The stack Contains 10, 20, 22, 26, 28, and 30, with 30 being at top of the stack. Show diagrammatically
        1. PUSH 46
        2. PUSH 48
        3. POP 3
        4. POP
        5. POP