K23U 3731

Reg. No. : .....

Name : .....

III Semester B.Sc. Degree (CBCSS – Supplementary) Examination, November 2023
(2017-2018 Admissions)
CORE COURSE IN COMPUTER SCIENCE
3B04CSC : Data Structure

Time : 3 Hours Max. Marks : 40

SECTION – A

One word answer : **(8×0.5=4)**

1. a) _____ is a sequence of steps executed by a computer that takes an input and transforms it into a target output.
   b) What is the time complexity of binary search ?
   c) The _____ condition checks if the stack is full before pushing any element.
   d) A queue data structure works on _____ principle.
   e) How many numbers of pointers need to modify in order to insert an element at the end of a linked list ?
   f) In which type of linked lists, traversals can be performed in both directions ?
   g) A _____ is a connected graph without any circuit.
   h) The length of the longest path from the root of the tree to a leaf node is called _____ of that tree.

SECTION – B

Write short notes on **any seven** of the following questions : **(7×2=14)**

2. How to represent array in memory ?
3. What is asymptotic notation ?
4. What is time complexity ?
5. Write a short note on bubble sort.
6. What is the significance of the circular queue over the queue ?

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7. Write a note on the priority queue.
8. What is linked list ?
9. What are the advantages of circular linked list ?
10. Describe complete binary trees.
11. How do you find the inorder traversal of a binary tree ?

SECTION – C

Answer **any four** of the following questions : **(4×3=12)**

12. How to perform polynomial addition using arrays ?
13. Explain selection sort with an example.
14. How can you use stacks to convert an infix expression to a postfix expression ?
15. Write the array implementation of the queue data structure.
16. Explain the linked list implementation of stack.
17. Create a binary search tree using the data elements ; 45, 15, 79, 90, 10, 55, 12, 20 and 50.

SECTION – D

Write an essay on **any two** of the following questions : **(2×5=10)**

18. Define data structures. Explain the classification of data structures in detail.
19. Explain linear search and binary search algorithms in detail with the help of algorithms and examples.
20. What is a stack data structure ? Explain different operations on the stack using array.
21. Write the procedure to perform the following operations :
    a) Search an item from a singly linked list.
    b) Merge two singly linked lists.
