K19U 2464

Reg. No. : .....

Name : .....

III Semester B.Sc. Degree (CBCSS-Reg./Sup./Imp.)
Examination, November - 2019
(2014 Admn. Onwards)
CORE COURSE IN COMPUTER SCIENCE
3B04CSC : DATA STRUCTURE

Time : 3 Hours Max. Marks : 40

SECTION-A

1. **One** word answer. **(8×0.5=4)**

a) BST stands for _____.
b) The insertion of elements in a stack takes place at _____.
c) Operation of accessing each element of a data structure exactly once is known as _____.
d) If the elements of a data structure form a sequence, then it is said to be _____.
e) The node without children in a tree is called _____.
f) Big Oh (O) notation stands for _____.
g) A matrix with most of the elements are zero is called _____.
h) The amount of time a program needs to run to completion is called _____.

SECTION-B

Write short note on any **Seven** of the following questions. **(7×2=14)**

2. Define θ and Ω notations of complexity.
3. Define linear and nonlinear data structures.
4. Define binary tree and binary search tree.
5. Briefly explain about tree.
6. Write a short note on sparse matrix.
7. What are the limitations of arrays?
8. What are the advantages of circular linked list?
9. Briefly explain about postfix expression.
10. How to insert an element into linked list?
11. What is meant by time and space complexity of algorithms?

P.T.O.

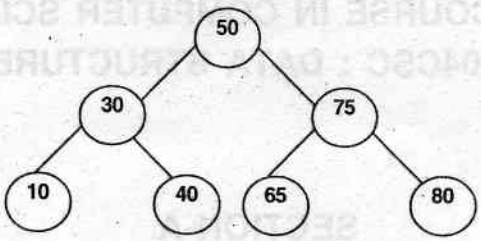
SECTION-C

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

12. Write an algorithm to reverse singly linked list?

13. For the following tree, write down the data in nodes using

a) In-order
b) Pre-order
c) Post-order



14. How to insert elements into circular queue?

15. Explain about linear search.

16. Explain about priority queue.

17. For the following array A, compute

a) The number of elements in A.
b) The space occupied by A in memory
c) The address of A[6,3]

Array: A Column Index: 0.5 Row index: 0:10 Base address: 1003
Size of the memory location: 2 bytes

SECTION-D

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

18. Write a program to implement stack using linked list.

19. Write an algorithm to convert an infix expression to postfix using stack. Using a simple example, show the status of stack after each step of algorithm.

20. Write a program to sort elements in ascending order using selection sort.

21. Define BST. Explain how to perform search operation in BST.