SE – 534

II Semester B.C.A. Examination, June/July 2026
(SEP 2024 – 25)
COMPUTER SCIENCE
24BCA21 : Data Structures

Rural First Grade College LIBRARY Acc. No. .... Date .... Bangalore – 562 ...

Time : 3 Hours Max. Marks : 80

Instruction : Answer all Sections.

SECTION – A

I. Answer **any eight** questions. **Each** question carries **two** marks. **(8×2=16)**

1) Differentiate between linear and non-linear data structures.
2) What are strings ? Give example.
3) What are the properties of Binary Tree ?
4) What are the advantages and disadvantages of Arrays ?
5) Write any two applications of stack.
6) What is static memory allocation ?
7) What is Queue overflow and underflow ?
8) Write any two differences between singly linked lists and doubly linked lists.
9) What are the applications of trees ?
10) What is linear probing ?

SECTION – B

II. Answer **any four** questions. **Each** question carries **six** marks. **(4×6=24)**

11) Explain Insertion Sort with an example.
12) Write and explain the algorithm to insert a node at the beginning and at the end of the singly linked list.

13) Construct Binary Search Tree for the following set of data.
45, 68, 35, 42, 15, 64, 78

14) Write a recursive algorithm to find factorial of a number.

15) How Queues are represented using linked lists ? Explain with an example.

16) Define Hashing and construct a Hash Table of size 20 and Hash function is defined as h(key) = key% table size. The following keys are to be inserted 1, 2, 42, 4, 12, 14, 17, 13 and 37.

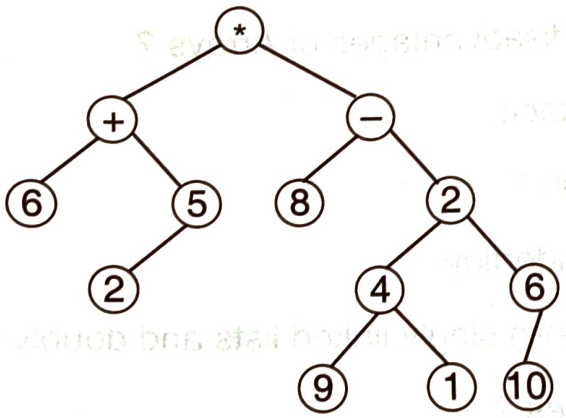
SECTION – C

III. Answer **any five** questions. **Each** question carries **eight** marks. (5×8=40)

17) a) Explain Depth First Search with an algorithm. 4

b) Differentiate between Trees and Graphs. 4

18) a) Write Pre-order, In-order and Post-order traversal for the given tree. 5



b) Define Directed Graph, Undirected Graph and Complete Binary Tree. 3

19) a) Convert the expression infix to postfix
A + (B * C – (D/E^F) * G) * H 4

b) Write a C program to concatenate two strings. 4

20) a) Write an algorithm for PUSH and POP operations on a stack using array. 4

b) Explain the working of circular Queue with an example. 4

21) a) What are the advantages and disadvantages of Doubly Linked Lists ? 3

b) Write a 'C' program to construct a single linked list and perform insertion and deletion operations. 5

22) a) Write the steps to sort the elements 35, 10, 40, 45, 15, 20, 25 using merge sort. 4

b) Construct an AVL tree by inserting the following elements in the given order 63, 9, 19, 27, 18, 108, 99, 81. 5

23) a) Write all the string functions with an example. 3

b) Differentiate linear and non-linear data structures.