



SE – 534

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

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.

P.T.O.



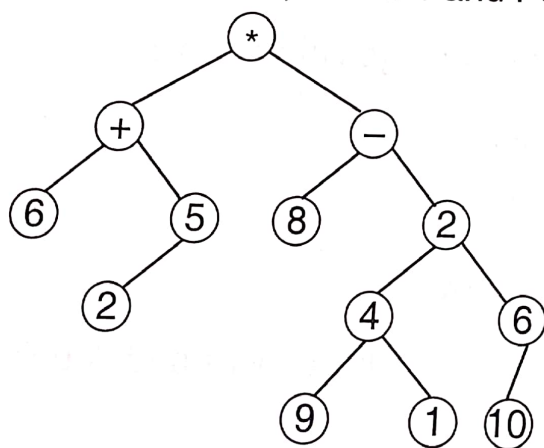


- 13) Construct Binary Search Tree for the following set of data.
45, 68, 35, 42, 15, 64, 78
- 14) Write a recursive algorithm to find factorial of a number.
- 15) How Queues are represented using linked lists ? Explain with an example.
- 16) Define Hashing and construct a Hash Table of size 20 and Hash function is defined as $h(\text{key}) = \text{key} \% \text{table size}$. 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. 4
- 23) a) Write all the string functions with an example. 5
b) Differentiate linear and non-linear data structures. 3
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