

B.Sc./3rd Sem/COS/25(NEP)

2025

3rd Semester Examination (CCFUP : NEP)

COMPUTER SCIENCE

Paper : MJ 3-T (Single Core Major)

(Data Structure)

Full Marks : 40

Time : Two Hours

The figures in the margin indicate full marks.

*Candidates are required to give their answers
in their own words as far as practicable.*

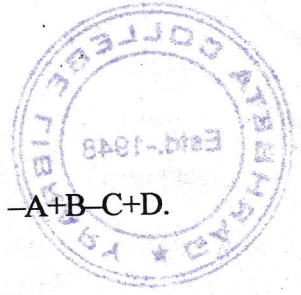
Group - A

Answer any **five** questions : $2 \times 5 = 10$

1. What is AVL Tree?
2. What is recursion?
3. Differentiate between sorting and searching techniques.
4. What is Hashing?
5. Define Deque.
6. What are the advantages of doubly linked list over singly linked list?

P.T.O.

(2)



7. Write the postfix form for the expression $-A+B-C+D$.
8. Define mid-square method hash function.

Group - B

Answer any *four* questions : $5 \times 4 = 20$

9. Evaluate the infix expression to prefix and postfix.

$$[a + (b - c)] * [(d - e) / (f + g - h)]$$

10. Construct a BST for the following element 47, 12, 75, 88, 90, 73, 57, 1, 85, 50, 62.
11. Define overflow and underflow with respect to stack with suitable example.
12. (a) What do you mean by non-linear data structure?
Give example.
(b) List out four areas in which data structures are applied extensively. $(2+1)+2$
13. What is a linked list? What are the pitfalls encountered in singly linked list? How can it be overcome? $2+2+1$
14. What is the output of selection sort after the 2nd iteration given the following sequence?

16 3 46 9 28 14

(3)

Group - C

Answer any *one* question : $10 \times 1 = 10$

15. Write an algorithm for insertion sort. What is polish and reverse polish notation? Discuss with suitable example.

$6+2+2$

16. Explain the addition and deletion operations performed on a circular queue with necessary algorithms. $5+5$
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