This question paper contains **3** printed pages]

ND—25—2023

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc (CS) (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(CBCS/Revised Pattern)

COMPUTER SCIENCE

Paper BCS-303

(Data Structure and Algorithm)

(Wednesday, 6-12-2023)   **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 Hours   *Maximum Marks*—75

N.B. :—   (*i*)   *All* questions are compulsory.

      (*ii*)   Figures to the right indicate full marks.

      (*iii*)   Assume suitable data, if required.

      (*iv*)   Use of any electronic media such as mobile phone, digital diary and electronic calculator is not permitted.

1.   Attempt any *five* of the following (**3** marks each) :   15

   (*a*)   What is Data Structure ?

   (*b*)   What is selection sort ? Explain.

                   P.T.O.

(c) What is Queue ? Explain in detail.

(d) Explain the concept of Linked list.

(e) Explain the operations on graph.

(f) What is Recursion ? Explain.

(g) Explain the concept of Header Nodes.

2. Attempt any *three* of the following (**5** marks each) :   15

(a) Explain Algorithm complexity.

(b) Explain elementary data organization.

(c) Describe representation of linear array in memory.

(d) Write an algorithm for traversing a linked list.

(e) Explain PUSH and POP operation in stack.

3. Attempt any *three* of the following (**5** marks each) :   15

(a) What is Polish Notation ? Explain.

(b) Describe in brief evaluation of postfix expression.

(c) Write an algorithm for insertion element in queue.

(d) What are the types of Binary tree ? Explain.

(e) Discuss graph theory terminology in brief.

4. Attempt any *three* of the following (**5** marks each) : 15

   (*a*) Write an algorithm for Deleting element from linear array.

   (*b*) What is Binary Search ? Explain.

   (*c*) Explain bubble sort with example.

   (*d*) Write an algorithm for searching a linked list.

   (*e*) Explain in detail two-way Linked List.

5. Write short notes on any *three* of the following : 15

   (*a*) Garbage collection

   (*b*) Linear search

   (*c*) Postfix and prefix notations

   (*d*) Dqueue

   (*e*) Traversing of binary tree.