

GYANMANJARI INNOVATIVE UNIVERSITY

GYANMANJARI INSTITUTE OF TECHNOLOGY

B.Tech .-Mid Semester Examination (MSE)-S2026

Enrollment No.: _____

Subject Code: BETCE13303

Subject Name: DATA STRUCTURE

Time: 10:30 AM to 12:30 PM

Date: 16/09/2026

Semester: 3

Total Marks: 60

Instructions:

1. Question No. 1 is compulsory.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define Data Structure and explain its types. 05
- (b) What is **recursion**? What care should be taken in writing recursive function? Give example of any one recursive function. 05
- (c) What is Stack. Write an algorithm of all stack operations with proper example. 10
- Q.2** (a) Explain Time Complexity and Space Complexity. 05
- (b) Compare Circular Linked List and Doubly Linked List for memory efficiency and data access speed with examples. 05
- OR**
- (b) Give the difference between Stack and queue. 05
- (c) Write a program to implement Hashing using both Division Method and Folding Method with collision handling. 10
- OR**
- (c) Explain simple queue and its operation and write a program for implementing queue. 10
- Q.3** (a) What is row major array and column major array. Explain with proper example. 05
- (b) Write a program of finding factorial of give number using Recursion. 05
- (c) Convert following infix expressions to the postfix and prefix conversion(i) $(A + B) * (C + D)$ (ii) $A * B + C * D$ 10
- OR**
- Q.3** (a) Write a short note on General Tree to Binary Tree Conversion. 05
- (b) Explain Bubble Sort Algorithm with example. 05
- (c) List disadvantages of Simple queue. Explain circular queue algorithm with insertion and deletion operation. 10