Master in Data Science
Mid-term Examination

Course Title: Data Structures and Algorithms (MDS502)
Full Marks: 45

Time: 2 Hrs.
Pass Marks: 22.5

Group A
Attempt all questions. (5 × 3 = 15)

1. What is data type. How is it different from ADT? (1 + 2)
2. Convert ((A+B)*C - (D - E))$(F+G) to prefix and postfix. (1.5 + 1.5)
3. What is priority queue? Explain.
4. What is recursion? Compare it with iteration. (1 + 2)
5. Explain recursive algorithm using suitable example. (3)

Group B
Attempt all questions. (5 × 6 = 30)

6. What is asymptotic notation? Explain Big-oh, Theta, and Omega notation in detail. (1.5 + 4.5)

   OR

   What is data structure? Why do we need it? Explain dynamic data structure and static datastructure with example. (1 + 2 + 3)

7. Define stack. How do you implement push and pop operations in Stack? Explain. (1 + 5)

   OR

   Explain algorithm to convert an infix expression to postfix with suitable example. (6)

8. Explain algorithm for evaluating postfix expression using suitable example (6)
9. Define queue. How do you implement queue operations using array data structure? Explain. (1 + 5)
10. Explain tail recursion with suitable program. (6)