QUESTION PAPER

SECTION A (2 marks × 10 = 20 marks)

Section A: Data Structures and Algorithms

1. (2 marks) What is the difference between a linked list and a queue?

2. (2 marks) Describe the time complexity of searching for an element in a linked list.

3. (2 marks) Explain the concept of hashing and its importance in data structures.

4. (2 marks) Describe the difference between linear and non-linear data structures.

5. (2 marks) Give an example of a data structure that can be implemented using both linear and non-lin

6. (2 marks) What is the time complexity of implementing an insertion operation in a linked list?

7. (2 marks) Explain the concept of recursion and its use in algorithm design.

8. (2 marks) Describe the time complexity of a recursive algorithm that solves a problem.

9. (2 marks) What is dynamic programming and how can it be used to solve problems?

10. (2 marks) Give an example of a real-world application of backtracking algorithms.

SECTION B (13 marks × 5 = 65 marks)

Q1 (13 marks)

Describe the difference between linear and non-linear data structures.

Q2 (13 marks)

Discuss the applications of Hashing. Explain the different types of Hashing algorithms.

Q3 (13 marks)

Describe the difference between algorithms and asymptotic notations.

Q4 (13 marks)

Discuss the greedy algorithm and its application.

Q5 (13 marks)

Provide an example of a dynamic programming algorithm and give its time complexity.

SECTION C (15 marks × 1 = 15 marks)

Q1: Explain the difference between linear and non-linear data structures. (5 marks)

Q2: Describe the time and space complexity of implementing a linked list using cursor-based linked