

**National Open University of Nigeria**

**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja**

**Faculty of Science**

**NOVEMBER, 2018 EXAMINATIONS**

**COURSE CODE: CIT341**

**COURSE TITLE: INTRODUCTION TO DATA STRUCTURE**

**CREDIT: 3 Units**

**TIME ALLOWED: 21/2 Hours**

**INSTRUCTION:Answer Question One (1) and any other Four (4)**

Question 1

1. With appropriate examples, explain Abstract Data Type? *(3 marks)*
2. What are the four properties of array lists? *(4 marks)*
3. Briefly explain any four properties of the linked List. *(4 marks)*
4. State and explain two basic operations in which a stack can be implemented.*(4 marks)*
5. What do you understand by Dynamic Programming and what are the four major steps involve in dynamic programming design? (5 marks)
6. Discuss the reason why dynamic programming relies on a principle of optimality.

(2 Marks)

Question 2

1. Explain the procedure of storing a Queue in a Dynamic Data Structure*(5 marks)*
2. Explain the concept of Hash Function (4 marks)
3. What do you understand by Hash Table? (3 marks)

Question 3

1. Hash tables are often used to implement the *symbol table* of a programming language compiler. Explain the function of symbol table in a compiler (3 marks)
2. With the aid of a diagram explain how a hash table uses Separate Chaining to resolve collisions (6 marks)
3. Write short on theBinary Tree (3 marks)

Question 4

1. Critically differentiate between a Preorder Traversal and Postorder Traversal (7 marks)
2. With the aid of diagram, explain the procedure of searching a Binary Tree (5 marks)

Question 5

1. Discuss the procedure of removing Items from an AVL Tree (3 marks)
2. Elucidate on what is meant by Reduce, Reuse, Recycle (6 marks)
3. What do you understand by the Fragmentation Problem (3 marks)

Question 6

Critically explain three different ways of performing memory allocation (12 marks)