QP CODE 2033511303

Reg. No

DMI-ST. EUGENE UNIVERSITY

ZAMBIA

DEGREE EXAMINATION – JUNE 2024

Semester: III **351CP13 DATA STRUCTURES AND ALGORITHMS**

Time: 3:00 Hours **Max. Marks: 100**

Answer any FIVE Questions (5 x 20 = 100 Marks)

1. a) Explain the fundamental characteristics of algorithms and why they are essential in problem-solving? **(10 Marks)**
   b) Compare and contrast pseudo code and flowcharts as algorithm design tools. Discuss their respective advantages and disadvantages. **(10 Marks)**
2. a) Illustrate the implementation of sequential organization in arrays and linked lists, highlighting their advantages and limitations. **(10 Marks)**
   b) Explain the memory representation of arrays and discuss the process of address calculation for accessing elements in an array. **(10 Marks)**
3. a) Discuss the concept of linked lists and compare sequential and linked organizations of data. **(10 Marks)**
   b) Discuss the representation of polynomials and sets using Generalized Linked Lists (GLL). **(10 Marks)**
4. a) Describe circular queue and its advantages. **(10 Marks)**
   b) Explain the concept of expression evaluation. Discuss the process of evaluating prefix and postfix expressions. **(10 Marks)**
5. a) Describe the comparison of sorting methods of bubble sort, insertion sort and shell sort. **(10 Marks)**
   b) Discuss Heap sort with example. **(10 Marks)**
6. a) Discuss common standard measures of efficiency used in algorithm analysis. **(10 Marks)**
   b) Explain the concept of algorithmic strategies, focusing on the Divide and Conquer strategy. **(10 Marks)**
7. a) Explain the concept of doubly linked operations with example. **(10 Marks)**
   b) Explain the Doubly circular linked list with example. **(10 Marks)**