UA-7426

Integrated M. C. A. (Sem. II)
Examination, June - 2025

IMCA-201T

Data Structures

Time allowed : **Three Hours**

Maximum Marks : **70**

Min. Marks : **28**

Note : *This question paper contains two sections as under :*

https://www.uokonline.com

Section-A

Max. Marks-20

*This section shall have **10** questions, having 02 questions from each unit with no internal choice. Answer in about **20** words. All questions will have **equal** marks. (10×02=20)*

Section-B

Max. Marks-50

*This section will have **10** questions, having 02 questions from each unit, one question to be attempted from each unit. Words limit approximately **400-500** words. Questions may have sub division. All questions will have **equal** marks. (10×05=50)*

SECTION - A

1 (i) Define data structure.

(ii) What is recursion?

(iii) Define stack.

(iv) Define circular queue.

(v) Define space and time complexities of an algorithm.

(vi) What is mean by DEQUE?

(vii) Define binary search tree.

(viii) Discuss the asymptotic notations.

(ix) What do you mean by double hashing?

(x) What is Max Heap?

https://pyqlelo.com

SECTION - B

UNIT - I

2 What is data structure? Explain various types of data structure in detail.

OR

Explain the row-major order and column-major order. How is index calculated in both?

UNIT - II

3 Discuss the circular link list. Write algorithm to insert a node at front and rear end in a circular linked list.

OR

Write the properties of LIST abstract data type with suitable example? What are the pitfall encountered in singly linked list? Why is the linked list used for polynomial arithmetic?

UNIT - III

4 Mention various application of the stack. Evaluate the following postfix express : 95 – 36 * – 97 –1.

OR

State the advantages of using infix and postfix notations? Evaluate the following infix expression a/b – c + d * e – a * c into postfix expression.

UNIT - IV

5 Explain operation and implementation of merge sort? Sort the sequence 13, 11, 74, 37, 85, 39, 22, 56, 25 using insertion sort.

OR

Write down the merge sort algorithm and give its wort case, best case and average case. Discuss the quick sort algorithm.

UNIT - V

6 Write and trace the following algorithm with suitable example :

(1) Breath first traversal

(2) Depth first traversal.

OR

Define minimum cost spanning tree? Write Prim's algorithm to find minimum cost spanning tree?
