

No. of Printed Pages : 5

MCS-208

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS
(PGDCA-NEW)**

Term-End Examination

December, 2025

**MCS-208 : DATA STRUCTURES AND
ALGORITHMS**

Time : 3 Hours

Maximum Marks : 100

Weightage : 70%

Note : (i) *Question No. 1 is compulsory.*

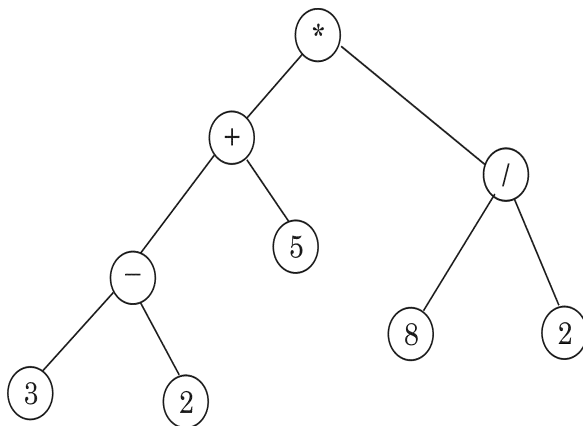
(ii) *Attempt any **three** questions from the rest.*

(iii) *All algorithms should be written nearer to 'C' language.*

B-1049/MCS-208

P. T. O.

1. (a) What is an algorithm ? What are its properties ? Explain tradeoff between space and time complexity of algorithms. Explain time complexity of linear search algorithm. 10
- (b) What is Stack ? Implement stack using array. 10
- (c) Write preorder and postorder traversals of the following tree : 10



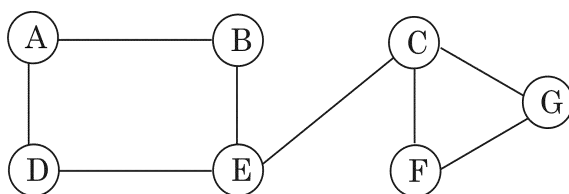
- (d) What is Link List ? Write algorithms for inserting and deleting element in link list. 10
2. (a) What is a binary tree ? What are its properties ? Explain how to create a binary tree with the help of a suitable code. 10
- (b) What is queue data structure ? What are its properties ? Implement queue using linked list. Make necessary assumptions. 10
3. (a) What is array ? Explain row major and column major representations of array with examples. 10

- (b) What is need of file organisation ? What are key drivers for file organization ? Explain indexed sequential file organization. 10

4. (a) Sort the following lists using Bubble Sort Algorithm. Showing intermediate steps : 10

25 8 22 90 80 60 10

- (b) What is graph ? Write adjacency matrix representation of the following graph : 5



- (c) What are B-trees ? What are its applications ? 5

5. (a) What is AVL tree ? Explain insertion of a node into an AVL tree. 5
- (b) Write binary search algorithm. 5
- (c) What is spanning tree ? Write and explain Prim's algorithm to find minimum cost spanning tree. Also, write the applications of spanning tree.

10

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