

M.C.M. - I (CBCS Pattern) Semester-II  
**PCMCMT204.2 - Paper-IV : Elective-II : Data Structure & File System**

P. Pages : 2

Time : Three Hours



**GUG/W/24/10769**

Max. Marks : 80

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- Notes :
1. All questions are compulsory and carry equal marks.
  2. Draw neat and labelled diagrams wherever necessary.
  3. Avoid vague answers and write answers relevant and specific to questions only.

**Either:**

1. a) What is Fundamentals of DS and how it can be helpful in solving complex problems? **8**
- b) What is complexity of Algorithm and how it is measured? **8**

**OR**

- c) What are Records and how are they used in Data Structures? **8**
- d) What is a Stack and how is it used in Data Structures. **8**

**Either:**

2. a) What are the properties of Recursion and how are they used to write efficient code? **8**
- b) What is the Tower of Hanoi problem and how is it used to demonstrate recursion? **8**

**OR**

- c) What are the Applications of Queue in programming? **8**
- d) What is a Linked List and how is it represented in memory? **8**

**Either:**

3. a) What is a tree and why is it important in data structures? **8**
- b) Describe the memory representation of a binary tree. **8**

**OR**

- c) Define the various terminologies used in graphs. **8**
- d) What is the Depth First Search (DFS) algorithm and how is it implemented? **8**

**Either:**

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|-----------|----|---|----------|
| <b>4.</b> | a) | What are the different classifications of sorting algorithms? | <b>8</b> |
|           | b) | Explain the operations that can be performed on a file.       | <b>8</b> |

**OR**

- |           |    |  |          |
|-----------|----|--|----------|
|           | c) | Discuss the role of B-trees in file organization.            | <b>8</b> |
|           | d) | Define and explain the concept of hash file organization.    | <b>8</b> |
| <b>5.</b> |    | Solve <b>all</b> the questions.                              |          |
|           | a) | Explain the different approaches for designing an algorithm. | <b>4</b> |
|           | b) | Introduce the concept of queues.                             | <b>4</b> |
|           | c) | Define a binary tree and describe its properties.            | <b>4</b> |
|           | d) | What are the file access methods? Explain.                   | <b>4</b> |

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