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Total No. of Printed Pages: [01]

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**M.Sc. (Mathematics) (Semester – 4<sup>th</sup>)**  
**DATABASE MANAGEMENT SYSTEMS**

**Subject Code: MCSE0-F99**

**Paper ID: [OE2220506]**

**Time: 03 Hours**

**Maximum Marks: 60**

**Instruction for candidates:**

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

**Section – A**

**(4 marks each)**

- Q1. Explain the concept of Data independence?
- Q2. What are the Integrity Constraints in a relational database?
- Q3. Explain the first three normal forms?
- Q4. What is the meaning and purpose of digital signatures?

**Section – B**

**(8 marks each)**

- Q5. How is a File Systems different from a DBMS? How is a DBMS better?
- Q6. Write basic SQL queries for Creating, inserting data, updating, and deleting a table?
- Q7. Explain the following two problems with the help of examples: Lost Update Problem, Inconsistent Read Problem
- Q8. Explain the role of indexing in File Organization?

**Section – C**

**(10 marks each)**

- Q9. Explain the following: Relational Model, Relational Algebra, and Relational Calculus?
- Q10. What is a deadlock? How is a deadlock handled in a concurrent system?
- Q11. How is the Access Control Mechanism used for database protection?