Roll No……..….. **Total No. of Printed Pages: 1**

Total No. of Questions: [11]

M. Comm. (Semester: 4th)

DATABASE MANAGEMENT SYSTEMS

Subject Code: MCSE0F99

Paper ID: [OE2210106]

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. What are the main advantages of using a DBMS over a file system?

Q2. Explain the purpose of SQL as a DML, DDL, and DCL.

Q3. Define functional dependencies and explain their role in schema refinement.

Q4. Differentiate between sparse and dense indexing with examples.

Section – B **(8 marks each)**

Q5. Explain database system architecture and describe the different layers of a DBMS.

Q6. Describe the process of converting an ER model into a relational schema with an example.

Q7. Explain the differences between BCNF and 3NF with suitable examples.

Q8. Describe the structure and functionality of B-trees in indexing.

Section – C **(10 marks each)**

Q9. Discuss relational algebra and relational calculus as formal query languages with examples of basic operations.

Q10. Explain the problems of lost updates and inconsistent reads, and describe how these can be managed in a database system.

Q11. Explain the role of encryption and digital signatures in database protection with examples.