



K16P 0102

Reg. No. : .....

Name : .....

I Semester M.C.A. Degree (Reg./Sup./Imp.) Examination, February 2016  
(2014 Admn. Onwards)

**MCA1C05 : DATABASE MANAGEMENT SYSTEMS**

Time : 3 Hours

Max. Marks : 80

- Instructions :** 1) Answer **any ten** questions from Section – A. Each question carries **three** marks.  
2) Answer **all** questions from Section – B. Each question carries **ten** marks.

SECTION – A

**Note :** Answer **any ten** questions. Each question carries **three** marks.

1. What is a Database ? What is a DBMS ?
2. Who is DBA ? What are the responsibilities of DBA ?
3. What is a transaction ? Which are the properties of a transaction and explain each.
4. What is entity and attribute ? Give some examples of entities and attributes in a manufacturing environment.
5. Define the term "Specialization of relational model".
6. What are stored and derived attributes ?
7. What is meant by functional dependencies ?
8. What is meant by computing the closure of a set of functional dependency ? Explain.
9. List the difference between Equi join and Natural join operations.

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10. Write short note on tuple relational calculus.
11. Explain QBE.
12. Explain the use of any two aggregate functions of SQL with an example for each.

## SECTION – B

**Note :** Answer **all** questions. **Each** question carries **ten** marks.

13. a) Describe the main characteristics of a database approach in contrast with the file oriented approach.  
OR  
b) Describe various components of DBMS environment and discuss how they relate to each other.
14. a) Create an ER diagram for the loan management system of a finance company. Loans are given on the purchase of various items with different interest rates. The company keeps track of defaulters and takes appropriate steps against them. Make and state suitable assumptions (if any).  
OR  
b) Discuss the conventions for displaying an ER schema as an ER diagram.
15. a) Consider a relation R (A, B, C, D, E) with the functional dependencies :  
{ $A \rightarrow C$ ,  $CD \rightarrow BE$ ,  $C \rightarrow BD$ ,  $DE \rightarrow AB$ }. Enumerate all candidates for R.  
OR  
b) What is normalization ? Explain the terms lossless join decomposition and dependency preservation. Show with the help of an example, the steps to create a relation in 1NF then to create 2NF relations and from 2NF to 3NF relations.
16. a) Given the relational schemes :  
ENROL (S #, C #, Section) – S # represents  
Student Number  
TEACH (Prof, C #, Section) – C # represents  
Course Number



ADVISE (Prof, S #) – Prof in thesis advisor of S #

PRE\_REQ (C #, Pre – C #) – Pre\_C # in prerequisite course

GRADES (S #, C #, Grade, Year)

Student (S #, SName)

Give queries expressed in relational algebra, tuple calculus and domain calculus for the following :

- i) List all students taking courses with Amith.
- ii) List all students taking at least one course that their advisor teaches.
- iii) List those professors, who teach more than one section of the same course.

OR

- b) Explain the following relational algebraic operations with the help of an example.
  - i) Cartesian product
  - ii) Division
  - iii) Selection and projection
  - iv) Join.

- 17. a) Explain entity integrity and referential integrity rules in relational model. Show how these are realized in SQL.

OR

- b) Consider the following relations for a database that keeps track of auto sales in a car dealership :

CAR (Serial #, Model, Manufacturer, Price)

OPTIONS (Serial #, Option\_Name, Price)

SALES (Sales\_Person #, Serial #, Date, Sale\_Price)

SALES\_PERSON (Sales\_Person #, Name, Phone)

Write SQL statements for the following queries :

- i) To create tables : CAR and SALES
  - ii) List the serial number and model of cars that have no options
  - iii) To delete serial # CA\_128 from car relation.
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