

2016

MCA

3rd Semester Examination

DATABASE MANAGEMENT SYSTEM

PAPER—MCA-301

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any four from the rest.

1. Answer the following questions (any five) : 2×5
- (a) Why 4 NF in Normal Form is more desirable than BCNF ?
 - (b) What is the purpose of Database Management System ?
 - (c) Define the properties of Transaction.
 - (d) Define : Functional dependency.
 - (e) Define : DDL, DML, DCL and DQL.

(Turn Over)

- (f) What is the domain of an Attribute ?
- (g) What is data model ?
- (h) Define derived attribute.
- (i) What do you mean by Entity and Entity-set ?
2. (a) What is Data Independence ? How many types of data independence available in DBMS ? Write its advantages. 2+1+2
- (b) What is the Difference between primary key and unique key ? 2
- (c) Define and discuss data constraints. 3
- (d) Compare and contrast hierarchical, network and relational data models. 5
3. Write short notes on following topics (any three) : 3×5
- (a) Meta data ;
- (b) Data Dictionary ;
- (c) Referential Integrity ;
- (d) Log file ;
- (e) Data redundancy ;
- (f) Single valued and multi-valued attributes.

4. The given database schema is 5×3
- Employee (FName, Initial, Lname, ENO, DOB, Address, Sex, Salary, Supereno, Dno)
- Department (Dname, Dnumber, mgreno, mgrstartdate)
- Dept_locations (Dnumber, Dlocation)
- Project (Pname, Pnumber, plocation, dnum)
- Works_on (EENO, PNo, hours)
- Dependent (EENo, Dependent Name, Sex, BDate, Relationship)

Where the underlined column names are primary keys.

Write the queries in relational algebra with the above schema.

- (a) Retrieve the name and address of all employees who work for the 'Research department'.
- (b) List the project numbers for projects that involve an employee whose last name is 'Kumar', either as a worker or as a manager of the department that controls the project.
- (c) For each department, retrieve the department name and the average salary of all employees working in that department.
- (d) List the names of all employees who have a dependent with the same first name as themselves.
- (e) Retrieve the average salary of all female employees.

5. (a) What is Normalization ? Why it is required ? 1+2
- (b) Why does BCNF stronger than 3 NF ? Explain with examples. 3
- (c) Describe 3 NF with suitable examples. 5
- (d) Determine the Normal Form of the following relation :
Clinic_DB (Patient_no, Patient_Name, Appointment_Id,
Time, Doctor)
Where the underlined column names are primary keys. 4
6. (a) Why does the concurrency control require in transactions ? 5
- (b) How does database system control concurrent transactions ? Describe any of the concurrent transaction control policies. 2+4
- (c) Describe the state diagram of a transaction. 4

[Internal Assessment : 30]
