53 (IT 402) DBMS

2016

DATABASE MANAGEMENT SYSTEMS

Paper : IT 402 (Back)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. 4×5=20

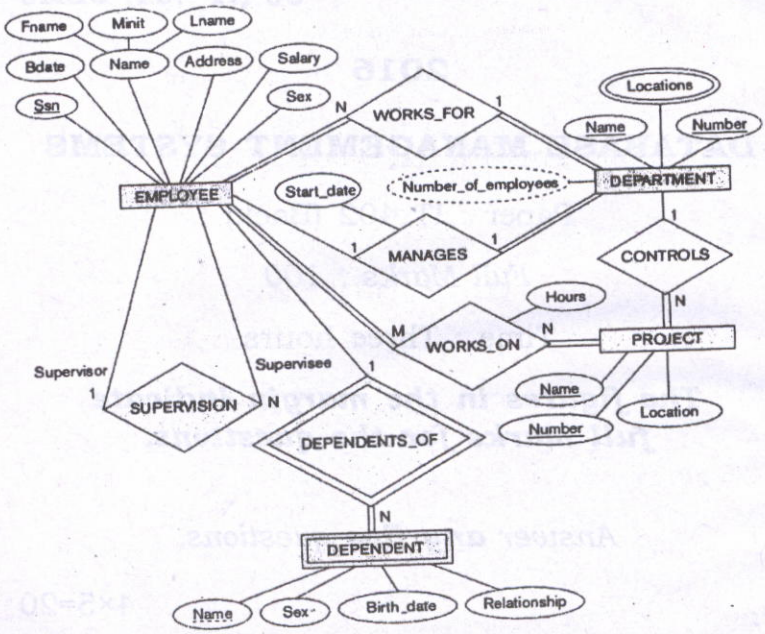
(a) Explain ANSI-SPARC architecture with neat diagram.

(b) Discuss briefly about the various characteristics of a database system.

(c) What are the physical, logical and view level data abstraction ?

(d) Define different types of keys.

2. *(a)* Consider the following ER diagram : 15



Map the above ER schema into a set of relations.

(b) What are the entity integrity and referential integrity constraints ? Give examples. 5

3. *(a)* Explain with examples how the outer join operations are different from inner join operations and how outer join operation is different from union operation. 10

(b) Explain the following relational algebra constructs with examples. 10

(i) SELECT

(ii) PROJECT

(iii) UNION

(iv) CARTESIAN PRODUCT

(v) DIFFERENCE

4. *(a)* Discuss the concept of transitive dependency and multivalued dependency. 5

(b) Define Normalization. Discuss in detail 1NF, 2NF, 3NF with example. 15

5. *(a)* Consider the following relational schema : 10

STUDENT (Name, Student_No., Class, Major)

COURSE (Course_Name, Course_No., Credit_hours, Department)

SECTION (Section_id, Course_No, Semester, Year, Instructor)

GRADE-REPORT (Student_No, Section_id, Grade)

PREREQUISITE (Course_No, Prerequisite_No.)

Write SQL query for the following :

(i) Retrieve the names of all students majoring in 'CS' (Computer Science).

(ii) Retrieve the names of all courses taught by Professor King in 2007 and 2008.

(iii) For each section taught by Professor King, retrieve the course number, semester, year and number of students who took the section.

Write SQL update statements to do the following on the above database schema.

(i) Insert a new student, <'Johnson', 25, 1, 'Math'>, in the database.

(ii) Delete the record for the student whose name is 'Smith' and whose student number is 17.

(b) Explain specialization and generalization feature of ER diagram with examples. 10

6. Write short notes on : ***(any four)*** 4×5=20

(a) Database Management System

(b) Hierarchical DBMS

(c) Boyce-Codd normal form

(d) Two-phase locking

(e) Query optimization.
