

(X)

S.N. of Q.P. : 862

Unique Paper Code 62341201

Name of the Course B.A.(Prog.)

Name of the Paper Database Management Systems

Semester II

Duration 3 Hours

Maximum Marks 75

(Write your Roll No. on the top of inv. No. on receipt of this question paper)

The paper has two Sections. All questions in Section A are compulsory. Attempt any five questions from Section B. All parts of a question must be attempted together.

### Section A

Q1. Answer the following questions:

- (a) Briefly describe the main phases involved in database design. (4)
- (b) Consider the following relations for a database that keeps track of employees working in a department. (3)

EMPLOYEE (Empno, Ename, Sal, Address, Bdate)  
DEPARTMENT (Deptno, Dname, Loc)

Specify the foreign key for this schema, stating any assumptions you make.

- (c) Write any four real-life applications of DBMS. (4)
- (d) What are the responsibilities of a Database Administrator (DBA)? (2)
- (e) Differentiate between the Relational and Network data model. (2)
- (f) Differentiate between composite key and composite attribute. (2)
- (g) Differentiate between logical data independence and physical data independence. (4)
- (h) What do you understand by a multivalued attribute and a derived attribute? Consider a relation. (4)

STUDENT (student\_number, address, mobile\_number, hobby, Date\_of\_Birth, age),

Identify the multivalued attribute(s) and derived attribute(s) in the given relation. State assumptions, if any.

(5)

Q2.

(a) Normalize the following relation up to third normal form:  
 Book (AccNo, Title, Author, Price, Stud\_No, Stud\_Name, Course\_No, Course\_Name, Issue\_Date).  
 State your assumptions, if any.

(5)

(b) For the following schema ORGANISATION, write SQL statements to create the tables by applying necessary constraints such as Primary key, Not Null, Unique, Foreign Key.

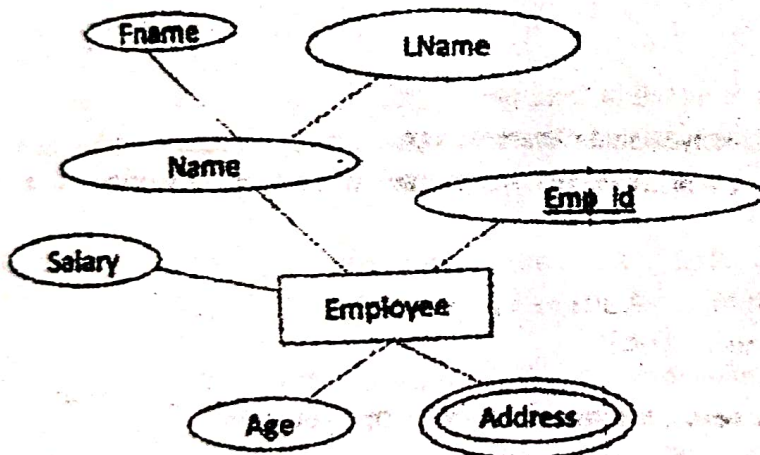
EmployeeInfo (Empid, Empfirstname, Emplastname, Department, Project, Address, Dateofbirth, Gender)

Employeeposition (Empid, Empposition, Dateofjoining, salary)

(3)

Q3.

(a) Considering the figure given below:



Determine the primary key attribute, composite attribute, and multivalued attributes from the figure given above.

(b) Differentiate between Naïve users and casual users.

(2)

(c) For the given binary relationships, suggest cardinality ratios. State assumptions, if any. (5)

Entity Type	Relationship	Entity type
EMPLOYEE	HAS	DEPENDENTS
DEPARTMENT	CONTROLS	PROJECTS
EMPLOYEE	WORKS ON	PROJECTS
PROJECTS	HANDED BY	EMPLOEES
PLAYER	PLAYING	E

Q4.

(a) Why do we need normalization in database? Explain four major guidelines of relational database design. (5)

(b)

Suggest appropriate datatypes in SQL for the following given attributes. (5)

- (i) Salary of an Employee
- (ii) Address of an Employee
- (iii) Date of Birth of an Employee
- (iv) Employee's department number
- (v) Name of an employee (10)

Q5.

Consider a COMPANY database having the following tables:-

DEPARTMENT (Department\_number, Department\_name, Location, Project\_number)

EMPLOYEE (Employee\_number, Salary, Address, Date\_of\_birth, Contact\_number, Project\_number, Department\_number)

PROJECT (Project\_name, Project\_number, Department\_number, Location)

The following are the assumptions:

- A Company has many departments.
- Each department has multiple employees.
- An Employee belongs to only one department.
- Each department controls multiple projects, and each project is handled by a single Employee.
- Each project is handled by a single Employee.

Draw an ER Diagram for the COMPANY database.

Q6. A database consists of the following Relations:

(5)

- (a) DEPT (DNO, DNAME, HOD, DYEAR)  
COURSE (CNO, CNAME, NO\_STUD, DEPT)

Write SQL Queries for the following:

- (i) Display the names and number of students in each course.
- (ii) List the name of "HOD" for those departments which were set up before 2004
- (iii) List the departments without having HOD.
- (iv) Display first four characters of each department's name from the DEPT relation.
- (v) Write a query to create a new table that consists of data and structure copied from the DEPT relation.

(b) What do you understand by data redundancy? What are the disadvantages of data redundancy?

(5)

Q7. Answer the following:

(10)

(a) How many PRIMARY KEY constraints can a relation have?

(b) Consider the following CREATE statement:

```
CREATE TABLE departments  
(dept_no NUMBER (2),  
Dept_name VARCHAR2 (14),  
Creation_date DATE DEFAULT SYSDATE);
```

What will happen, if the DEFAULT clause specification is removed from the statement?

(c) Consider the following CREATE statement:

```
CREATE TABLE departments  
(dept_no NUMBER (2) CONSTRAINT dept_no_pk Primary Key, Dept_name  
VARCHAR2 (14), Creation_date DATE DEFAULT SYSDATE);
```

What modification can be made to the above statement to give it a table level constraint?

(d) Differentiate between ALTER and UPDATE commands.

(e) Consider the following relation:

```
EMPLOYEES ( emp_no, emp_name, salary, birth_date, address)
```

Add a constraint to the EMPLOYEES relation which restricts the addition of those employees who have salaries less than 10000.

Q8. Write short notes on any 5 of the following:

- (a) Atomic and Multivalued attributes
- (b) Stored and Derived attributes
- (c) Meta-data
- (d) 1:1 and 1: N Relationships
- (e) Strong and Weak entity sets
- (f) Super Key