

(c) Suggest appropriate data types for the following attributes

(i) Date of birth

(ii) Marks of a student

(iii) Employee id

(iv) Name of a school. 4×1=4

7. (a) What is a binary relationship ? Illustrate the same with the help of an example. 4

(b) Describe the three level architecture of database approach for a DBMS with the help of a block diagram. What is the difference between logical and physical data independence. 4+2=6

25/5/17 (Evening)

This question paper contains 8 printed pages]

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S. No. of Question Paper : 2395

Unique Paper Code : 32345201 GC-4

Name of the Paper : Introduction to Database Systems

Name of the Course : GE : Computer Science for Honours

Semester : II

Duration : 3 Hours Maximum Marks : 75

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

Question No. 1 is compulsory.

Attempt any four of question Nos. 2 to 7.

Parts of a question must be answered together.

Marks are indicated against each question.

1. (a) Differentiate between tuples and attributes of a relation.

Illustrate by giving an example. 4

(b) For the binary relationships given below, suggest the cardinality ratio based on the common sense meaning of entity types.

Entity1	Cardinality	Entity2	Ratio
(i) STUDENT (Enrolled in a Course)	.....	TEACHER	
(ii) CLASSROOM	.....	BLACKBOARD	
(iii) COUNTRY	.....	CURRENT_PRESIDENT	
(iv) EMPLOYEE	.....	DEPARTMENT	4

(c) Justify the following statements : 2x3=6

- (i) Primary key cannot be null.
- (ii) Weak entities do not have their own key attributes.

(d) Define foreign key. Why is it used ? 2

(ii) Find the people who work for the company 'Infosys' with a salary more than Rs. 50,000. List the names of the people, along with the street and city addresses.

(iii) Find the names of the persons who do not work for the company 'HCL'. 3x2=6

(b) What do you understand by Normalization in database design ? Explain Third Normal Form (3NF) by taking suitable example(s). 4

6. (a) What is a relationship set ? 2

(b) Give short answers for the following :

- (i) Properties that describe an entity's characteristics
- (ii) Language used to define data in a database.
- (iii) SQL clause used for sorting the tuples
- (iv) SQL clause used for pattern matching in a string. 4x1=4

- (b) Each department is described by a name, department code, office number, office phone, major department, minor department and degree program (B.A., B.Sc. etc.)
- (c) Each section has an instructor, semester, year, course and section number.

Design an ER diagram for the above problem. Specify key attributes of each entity. 10

5. (a) Consider the following tables:

WORKS (Pname, Cname, Salary)

LIVES (Pname, Street, City)

LOCATED\_IN (Cname, City)

MANAGER (Pname, Mgrname)

Where Pname=Person name, Cname=Company name and Mgrname=Manager Name

Write SQL queries for the following :

- (i) List the names of the people who work for the company Wipro along with the cities they live in.

- (e) What is a relational data model ? Explain in the context of a relation 'STUDENT'. 1+2=3
- (f) Consider the following database schema.

STUDENT

Name	Student_id	Class	Major	Marks
Smith	17	1	CS	85
Brown	8	1	CS	76
Jane	14	1	CS	65
Bob	5	1	CS	90

Write SQL statements to perform the following operations on the above database.

- (i) Insert a new student, <'Johnson', 25, 1, 'MATH'>, in the database.
- (ii) Change the class of 'Smith' to 2.
- (iii) Delete the record for the student whose name is 'Smith' and whose 'Student\_id' is 17. 3x2=6

(g) Differentiate between DROP and DELETE command with the help of one example each. 4

(h) Consider the relation given in Q.1 (f). Write SQL queries for the following tasks :

(i) Display the name and marks of the student who scored highest marks.

(ii) Display total number of students.

(iii) Display average marks of the class. 3×2=6

2. (a) Define the following terms :

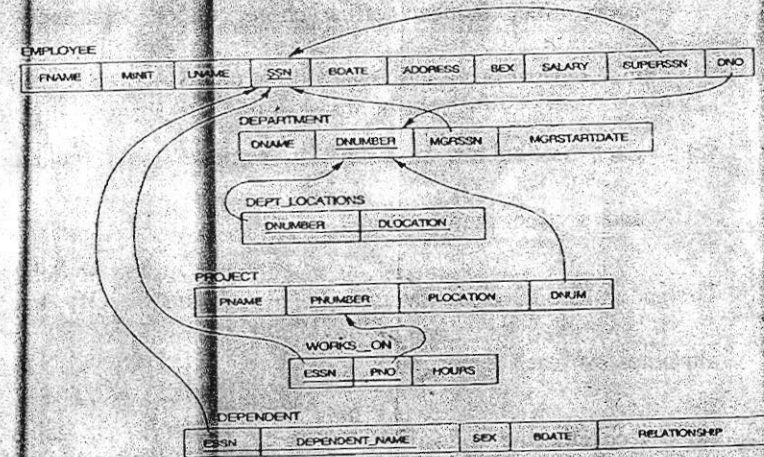
(i) Meta data

(ii) Candidate key. 2×1=2

(b) What are the four types of database users ? Discuss the role of each. 4

(c) Differentiate between HAVING and WHERE clause. Illustrate the same by giving one example. 4

3. Consider the following COMPANY database schema :



(i) Specify six primary and six foreign keys for this database schema. 6

(ii) Write CREATE TABLE command for the relation DEPARTMENT specifying primary and foreign key constraints. 4

4. Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students' transcripts:

(a) The University keeps track of each student's name, student number, social security number, current address, birthdate and sex.