

**CERTIFICATE IN MOBILE APPLICATION
DEVELOPMENT (CMAD)**

Term-End Examination

June, 2022

BCS-092 : INTRODUCTION TO DATABASES

Time : 3 hours

Maximum Marks : 75

Note : *There are **five** questions in this paper. Question no. 1 is **compulsory** and carries 30 marks. Attempt any **three** questions from the rest (Questions no. 2 to 5).*

1. (a) Explain any five characteristics of database approach. 5
- (b) Explain the three levels of database architecture. 3
- (c) A grocery store maintains the list of products, its customers and purchases made by the customers. Each product is identified by a product id, product name, price per unit and description. A customer is assigned a unique customer id. The customer information includes customer name, phone number and address. Each purchase made by a customer is recorded along with the date of purchase and quantity of purchase.

Answer the following questions for the description given above :

- (i) List all the entities and their attributes for the system. 3
 - (ii) Identify the relationships among/between the entities. 2
 - (iii) Make an ER diagram for the system. 3
 - (iv) List the primary and foreign keys of the system. 4
- (d) Consider the following two relations :
- Customer (cust_ID, name, phone, PAN)
- Account (cust_ID, account_number, balance)
- Write the following queries using SQL : 8
- (i) Find all the account numbers whose balance is more than 1,00,000.
 - (ii) List the cust_ID, name and phone of the customer whose PAN is “AAAAA1234F”.
 - (iii) List all the account numbers and balance of a customer whose PAN is “AAAAA1234F”.
 - (iv) Find the total number of customers.
- (e) List all the steps of SDLC for database development. 2

2. (a) Explain the concept of logical data independence and physical data independence. 5
- (b) Explain the hierarchical database model, with the help of a diagram. How is this model different from the network database model? 5
- (c) Explain the terms Relation and Domain, with the help of an example. Also explain the terms Tuple and Attribute. 5
3. (a) Explain the many-to-many relationship, with the help of an example. What is a unary relationship? 5
- (b) Why may a database have data redundancy? What are the three data anomalies? Explain with the help of an example of each. 7
- (c) Define the entity integrity and referential integrity constraints in a database system. 3
4. (a) Normalize the following table to 3rd Normal form : 6

Book_id	Book_title	Author	Publisher
B01	DBMS	Ullman	ABC
B01	DBMS	Korth	ABC
B02	Android	Rajaraman	CXZ
B03	OOP	John	ABY

It may be noted that Book B01 has two authors, that is why there are two records of the Book in the table. Show all the steps of the process of normalization.

- (b) Write SQL command to create the following table :

6

Table name : Student

Attributes :	Attribute Name	Type	Length
	Enrolment No	Character	10
	Name	Character	25
	Fee paid	Integer	6
	Phone	Character	10

The constraints on the attributes are :

- (i) Enrolment No is the primary key.
 - (ii) Fee paid should not be less than ₹ 10,000.
 - (iii) Phone number should not be left blank at the time of data entry.
- (c) What is the purpose of Group by Clause in SQL ? Explain with the help of an example. 3

5. Explain any **five** of the following, with the help of a diagram/an example : 5×3=15

- (a) Outer Join
- (b) Maintenance Phase in SDLC
- (c) Cardinality of a Relationship in ERD
- (d) Object-Oriented Database Model
- (e) Limitations of File-based System
- (f) Distributed Database System