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MCS–207

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS
(REVISED) (PGDCA–NEW)**

Term-End Examination

December, 2024

MCS-207 : DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours

Maximum Marks : 100

Weightage : 70%

Note : *Question No. 1 is compulsory and carries 40 marks. Attempt any **three** questions from Question No. 2 to Question No. 5.*

1. (a) A bookstore maintains the following information about its customers :
- A customer identification number, which is unique
 - Customer name, customer address

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- The list of books available with the bookstore. Each book can have number of copies. Each book has one or more authors.
- The list of books ordered by a customer.

Perform the following tasks for the description given above :

- (i) List the names of all the entities. 2
 - (ii) List the attributes of the entities. 2
 - (iii) List the relationships between/among the entities. 2
 - (iv) Draw an E-R diagram for the above. 2
 - (v) Convert the E-R diagram, drawn as answer to part (iv) to relations. 2
 - (vi) List the primary key and foreign key constraints of the relations. 2
- (b) Consider the following relations : $4 \times 2 = 8$

Account(accountno, balance)

Accountholder(accountno, customerno)

Customer(customerno, name, address)

Please note that an account can be held jointly by more than one customer.

Write the SQL commands for the following queries for the relations given above :

- (i) To list the names of all the customers of the bank, in the order of names.
 - (ii) To list all the account numbers for which balance is less than ` 2,000.
 - (iii) To list all the account numbers of the customer whose name is “XYZ”.
 - (iv) To list the accountno, customerno and balance of all the accounts.
- (c) What is a transaction in the context of a database system ? Explain with the help of an example. Explain the basic properties of transactions with the help of an example of each. 10
- (d) Explain the following : $2\frac{1}{2} \times 4 = 10$
- (i) Weakness of relational database management system

- (ii) Multi-dimensional data model of a data warehouse
 - (iii) Classification in the context of data mining
 - (iv) Applications of multimedia database
2. (a) What is a sequential file ? What is the structure of a sequential file ? Explain with the help of a diagram. List the advantages and disadvantages of using sequential files. 8
- (b) Define and explain the concept of integrity constraints with the help of example(s). 6
- (c) Explain the three layer architecture of DBMS with the help of a diagram. 6
3. (a) Explain the update anomaly, insertion anomaly and deletion anomalies in the context of relational database system with the help of an example. 6

- (b) What is multi-valued dependency (MVD) ?
Explain with the help of an example. How
is MVD different from functional
dependency ? 8
- (c) Explain the self join and outer join. 6
4. (a) Explain the states of a transaction
execution with the help of a diagram. Also
define the lost update and unrepeatable
reads problems of concurrent execution of
transactions with the help of an example of
each. 10
- (b) What is database recovery ? Explain the
log based recovery with the help of an
example. 6
- (c) Which of the relational operators has
maximum query execution cost ? Explain
with the help of an example. 4
5. Write short notes on any *four* of the following ;
4×5=20
- (a) Object-relational database system
- (b) Data warehouse and its characteristics

- (c) Geographic Information Systems
- (d) Data Mining
- (e) Basic model of database access control
- (f) Functional Dependencies
- (g) Relational Model

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