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MCS-207

POST GRADUATE DIPLOMA IN COMPUTER APPLICATION (PGDCA-NEW)

Term-End Examination

December, 2023

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****.*

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1. (a) A bank wants to develop an application to store information about Customer and Bank. Answer the following [Mention all the assumptions] :

   (i) List all the entities and related attributes. 3

   (ii) Relationship among all the entities identified in (i) part. 3

   (iii) List all the constraints and draw an E-R diagram as per above entities, attributes, constraints and relationships. 4

(b) Define a serializable schedule. Determine whether given schedule (Schedule A) is serializable or not : 5

Schedule A	
T_1	T_2
Read (X)	—
—	Read (X)
Write (Y)	—
—	Write (Y)
Commit	—
—	Commit

(c) Write the SQL commands for the queries on the following relations : 8

Student (st_id, name, programme_code)

Programme (programme_code, Prof_name, fee)

(i) List the name of all the students of the programme whose programme_code is 'MCA'.

(ii) List all the programmes in the increasing order of programme fee.

(iii) Find the total number of programmes of the university.

(iv) List st_id, name, prof_name for all the students.

(d) Explain different kinds of failures that a transaction program encounters during execution. 4

(e) Differentiate between data security and data integrity. 3

(f) Explain different components and processes of data warehouse with the help of a diagram. 5

(g) Consider the following relations : 2+3

Relation P

Pid	Pname
001	abc
012	xyz
014	lmn
015	opq
017	ssd

Relation Q

Pid	Pname
012	xyz
014	lmn
016	sss
017	ssd

Find the following :

(i) $P \cup Q$ (Union of P & Q)

(ii) $P \times Q$ (Cartesian product of P & Q)

2. (a) Explain the sequential file organization with the help of a diagram. Also discuss the advantages and disadvantages of it. 10

   (b) Explain 1NF, 2NF and 3NF with the help of appropriate examples. 3+3+4

3. (a) Why do we need locks in database management systems ? Explain different types of locks with the help of an example. Also discuss two phase locking (2PL) with a suitable diagram. 10

   (b) What is the need of concurrent transactions ? Discuss different problems associated with concurrent transactions with the help of an example. 10

4. (a) Justify the need for object oriented databases over relational databases. Explain complex data types, inheritance object identify and reference types with respect to object relational database systems. 10

   (b) What is functional dependency ? Explain with the help of an example. 4

   (c) List and explain any *three* data definition language (DDL) commands of SQL. 6

5. Write short notes on the following : 5×4=20

   (i) Weak entity and strong entity

   (ii) Multivalued and dependency

   (iii) Data dictionary

   (iv) Query processing