Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– III EXAMINATION – WINTER 2018

Subject Code: 4639303 Date: 07-01-2019

Subject Name: Database Management Systems

Time: 10.30 am to 1.00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. 1 (a) Do as Directed. **07**

1. Out of following who is not an Actor on scene for DBMS:
   a.) Database Designer b.) End User
   c.) Database Administrator c.) Programmer
2. Database State is also known as a _____.
3. Give full forms of following abbreviations.
   DML VDL SDL ODMG
4. Give syntax of projection operation in relational algebra.
5. Convert following SQL query in to relational algebra form.
   Select MAX(Salary) as "Salary" from Employee where DNO = 5;
6. What is Functional Dependency?
7. What is Super Key?

Q. 1 (b) Differentiate following:

Transaction Rollback V/s Cascading Rollback	**02**
Stored Attribute V/s Derived Attribute	**02**
Primary Key V/s Super Key	**02**
Entity V/s Entity Set	**01**

Q. 2 (a) Why DBMS is important, justify your answer with appropriate considerations and their examples. **07**

Q. 2 (b) Draw an ER-Diagram for Online Banking Management. Make appropriate assumptions to decide entities and relationships between entities. **07**

Mentioned all assumptions which you did to decide the cardinality of each relationship. (Use UML Class Notations to draw ER-Diagram)

OR

Q. 2 (b) Show the notations of EER-Diagram and draw EER-Diagram to show the generalization and specialization concept in the following entities. **07**

Vehicle (VIS, Price, LicenseNo, #Passengers, MaxSpeed, #Axles, Tonnage, VType)

Q. 3 (a)	What are the different phases for Higher Level Conceptual data model for Database Design? Draw a diagram and give a brief introduction of each phase.	**07**
Q. 3 (b)	1. What is transaction? Explain properties of transaction. 2. Write a short note on Two-Phase Locking Protocol.	**04** **03**

OR

Q. 3 (a)	What are the phases of Three-Schema Architecture of DBMS? Draw the diagram and explain each phase in detail.	**07**
Q. 3 (b)	1. Write a short note on Wait-for graph. Explain how to detect dead lock using wait-for graph. 2. Differentiate : Serializable Schedule V/s Non-Serializable Schedule	**04** **03**
Q. 4 (a)	Explain all available Set Operations in Relational Algebra.	**07**
Q. 4 (b)	What is Normalization? Why normalization is require? Explain 1st NF, 2nd NF and 3rd NF with examples.	**07**

OR

Q. 4 (a)	Write steps of algorithm for testing Serializability of a Schedule.	**07**
Q. 4 (b)	What is decomposition? Explain the properties of decomposition.	**07**
Q. 5 (a)	What is concurrency? Explain why concurrency control is needed.	**07**
Q. 5 (b)	Explain UNDO and REDO recovery based on Differed Update.	**07**

OR

Q. 5 (a)	What is database recovery? Why recovery is needed?	**07**
Q. 5 (b)	Explain Shadow Paging as a recovery techniQ.	**07**

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