Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 650004 Date: 17-05-2013

Subject Name: Advanced Data Base Management System

Time: 02.30 pm - 05.00 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)**	Explain in brief the advantages of using the DBMS Approach.	**07**
	(b)	1. Explain Three-Schema Architecture in brief.	**03**
		2. Explain the terms Logical Data Independence and Physical Data Independence	**02**
		3. Assume that X and Y are private key and public key, respectively, of user A, and P and Q are private key and public key, respectively, of user B. If message M needs to be send from user B to user A, then which of these keys is used to encrypt the message and which of these keys is used to decrypt the message in a public key infrastructure?	**02**
Q.2	**(a)**	1. Write a short note on the Data and Advanced Encryption Standards	**04**
		2. Which of the following attributes should be considered for access structure such as Indexing?	**03**
		a) An attribute A which is frequently used in selection condition	
		b) An attribute B which is frequently changed by an update operation	
		c) An attribute C which is frequently used in join condition	
	(b)	Differentiate between fixed-length records and variable-length records. What are the reasons for having variable-length records? Discuss the types of separator characters needed for each.	**07**
		OR	
	(b)	Discuss the deferred update technique of recovery. What are the advantages and disadvantages of this technique? Why is it called No-UNDO/REDO method?	**07**
Q.3	**(a)**	Under what situation would de-normalization of a database schema be used? Give examples of de-normalization.	**07**
	(b)	What is Mandatory Access Control (MAC)? List typical security classes used in MAC? Explain the concept of filtering and poly-instantiation taking suitable example.	**07**
		OR	
Q.3	**(a)**	1. Write a short note on Type Constructors, an Object-Relational support in SQL-99.	**04**
		2. Explain with suitable example the Nested Relational Model.	**03**
	(b)	1. How does Distributed DBMS support increased reliability and availability?	**03**
		2. What is Data Localization in DDBMS? How does it improve performance?	**04**
Q.4	**(a)**	1. Why does the index file for a primary index need substantially fewer blocks than the data file?	**02**

2. Why can we have at most one primary or clustering index on a file, but several secondary indexes? **02**
3. What do you mean by Type Inheritance in Object Relational DBMS? **03**

(b) 1. Discuss the merits and demerits of Primary Site Technique and Primary Copy Technique used in distributed concurrency control. **04**
2. What is database link in Oracle? What is snapshot in Oracle? What is the difference between basic replication and advanced (symmetric) replication in Oracle? **03**

OR

Q.4 **(a)** Explain following methods used in GIS (Geographic Information System) in brief: Equal, Cross, Overlap, Distance, Buffer, Union, and Difference. **07**

Q.4 **(b)** Write a short note on SQL*Plus Copy command. **07**

Q.5 **(a)** 1. Define the terms Distributed Databases and Distributed DBMS (DDBMS). **02**
2. What do you mean by Horizontal Fragmentation, Vertical Fragmentation, and Mixed (Hybrid) Fragmentation? **03**
3. Explain in brief Distribution (Network) Transparency and Replication Transparency. **02**

(b) Consider the following facts and rules. Note that Supervise(X, Y) means X supervises Y, Superior(X, Y) means X is superior of Y, and Subordinate(X, Y) means X is subordinate of Y. **07**

Facts:
Supervise(bb, dd), Supervise(bb, ee), Supervise(bb, ff), Supervise(cc, gg), Supervise(cc, hh), Supervise(aa, bb), Supervise(aa, cc)
Rules:
Superior(X, Y):- Supervise(X, Y).
Superior(X, Y):- Supervise(X, Z), Superior (Z, Y).
Subordinate(X, Y):- Superior (Y, X).
Solve the following queries:

1. Superior (aa, Y)?
2. Superior (bb, ff)?
3. Superior (bb, gg)?
4. Subordinate (hh, Y)?
5. Subordinate (dd, aa)?
6. Superior (gg, Y)?
7. Superior (cc, dd)?

OR

Q.5 **(a)** 1. Distinguish between the Tuple Versioning approach and Attribute Versioning approach. What do you mean by time-varying attribute and non-time varying attribute? **04**
2. What are the advantages of Truncate command over the Delete command? **03**

(b) Write a short note on “nature of multimedia data”. **07**

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