

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

Fifth Semester of B. Tech. Examination (CE/IT)

November 2013

IT303.01 Advanced Database Management System

Date: 25.11.2013, Monday

Time: 10:00 a.m. To 01:00 p.m.

Maximum Marks: 70

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION - I

- Q - 1 (a) "Fully Distributed and Client/Server DDBMS are to be considered as Multiple-site process with Multiple-site data" True/False ? Justify your answer. [02]
- (b) Explain user-process and server-process with respect of Transaction server in depth. [05]
- Q - 2 (a) What is the difference between transient and persistence object in OODBMS? What are the different approaches to make objects persistence? Why is it required to make object persistence in OODBMS? [06]
- (b) What is lock de-escalation? Under what conditions is it required? Why is it not required if the unit of data shipping is an item? [05]
- (c) In a range selection on a range-partitioned attribute, it is possible that only one disk may need to be accessed. Describe the benefits and drawbacks of this property. [03]

OR

- Q - 2 (a) How does the concept of an object in the object-oriented mode differ from the concept of an entity in the entity-relationship model? Explain with an example. [06]
- (b) Let relation r contain the following tuples: [05]
- (9, UNK, 4)
(UNK, 9, 2)
(6, UNK, 2)
(4, 2, UNK)
(UNK, UNK, UNK)
- Consider V is a range variable that ranges over r , find the truth value for the following given expression.
- (1) EXISTS V (MAYBE(IS_UNK($V.C$)))
(2) EXISTS V ($V.B > 4$)
(3) FORALL V ($V.A > 5$)
(4) FORALL V ($V.B > 1$ OR IS_UNK($V.B$))
(5) EXISTS V (MAYBE($V.C > 3$))
- (c) Explain many server many router model of TP Monitor with diagram. [03]
- Q - 3 (a) Construct a B+-tree for the following set of key values: [08]
- (2, 6, 17, 20, 24, 25, 27, 29, 30, 31, 5, 21, 1, 40, 45, 70)
- Values are added in given order only. Construct B+-tree for cases where number of pointers are five in one node.

- (1) What are the maximum number of nodes splitting operations that may take place?
 - (2) Insert 32 and 50 in original tree and modify.
 - (3) Delete 17 and 27 after insertion operation (modification).
- (b) Work through RSA public key encryption scheme with $p=7$, $q=5$, $e=17$ for plaintext $p=3$ and generate public and private key pair. Encrypt and decrypt the plain text using generated key pair. [06]

OR

- (b) What do you mean by authentication? How to provide authentication by the database server, explain with an example. [06]

SECTION - II

- Q - 4 (a) Attempt the following:** [04]
- (1) Differentiate Clustered and Non-clustered index.
 - (2) "An index is an optional structure, associated with a table or table cluster" True/False. Justify your answer.
- (b) What the purpose of view? Explain how to denied DML operations on view with an example. [03]
- Q - 5 (a) Give an example of a join that is not a simple equijoin for which partitioned parallelism can be used. What attributes should be used for partitioning?** [05]
- (b) Explain the term scale up and speed up with example. Also List and explain the factors limiting Speed Up and Scale Up. [05]
 - (c) Consider a failure that occurs during 2PC for a transaction, for each possible failure, explain how 2PC ensures transaction atomicity despite the failure. [04]

OR

- (b) Compare partitioning techniques with respect of Parallel databases. [05]
 - (c) Under which situations will it be beneficial to have replication or fragmentation of data? Explain through proper example. [04]
- Q - 6 (a) Answer the following (Any Four)** [12]
- (1) List out the components of logical database structure of database server and explain any one of them in detail.
 - (2) Explain the distinction between closed and open hashing. Discuss the relative merits of each technique in database applications.
 - (3) Explain Shared disk and Shared memory architecture of parallel database.
 - (4) Explain group commit with example. Does group commit solve the problem of cascading rollback.
 - (5) Explain Skew problem in I/O Parallelism and how to handled skew in partitioning.
- (b) "It is very difficult to grant and manage common privileges needed by different groups of database users" True/False. Justify your answer. [02]
