Printed Pages—4   CA304

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1299 **Roll No.** [1 2 4 5 9 1 4 0 6 1]

MCA

(SEM. III) ODD SEMESTER THEORY EXAMINATION 2013-14

DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours   *Total Marks : 100*

Note :– Attempt **all** Sections.

SECTION–A

1. Attempt all questions :   (2×10=20)

(i) Explain DBMS catalog and metadata.

(ii) Define the term DDL and DML.

(iii) Explain Intergrity Constraints. Describe their importance.

(iv) What do you understand by unary and binary operations in relational algebra ?

(v) What do you understand by Triggers ?

(vi) Are normal forms alone sufficient as a condition for a good schema design ? Explain.

(vii) What is the difference between lock-based technique and timestamp-based technique ?

(viii) Explain locking granularity, coarse granularity and fine granularity.

(ix) What do you mean by distributed database ?

(x) Illustrate the difference between relation schema and relation instance.

SECTION–B

2. Attempt any **three** questions : (3×10=30)

(a) Consider the following relation schema for the SALES database :

CUSTOMER (CustNo, Cust_name, Address)

ORDER (OrderNo, Order_date, Cust_no, Qty, Amount)

PRODUCT (ProdNo, Price, Order_no)

Specify the foreign key constraints for the SALES database. Also insert some tuples in the relations and some examples of deletion of tuples that violate referential integrity constraints. Make any assumption, wherever necessary.

(b) What is a Deadlock ? Discuss any one deadlock detection algorithm in database transactions processing.

(c) What do you understand by serialization of schedules ? How testing of serializability is done ? Explain.

(d) (i) When is an expression in tuple relational calculus said to be unsafe ? How can safe expressions be defined ? Explain with an example.

(ii) Discuss Join Dependencies.

(e) Consider a relation R (A, B, C, D, E) with following functional dependencies AB→C, CD→E and DE→B. Is AE a candidate key of this relation ? If not, which is the candidate key ? Explain.

SECTION–C

3. Attempt any **five** parts : $(5×10=50)$

(a) What are the Stored Procedures ? When are they beneficial ? Give the syntax and example of creating a procedure and function in SQL.

(b) (i) What are Assertions ? Why are they necessary ?

(ii) What are the conditions under which views can be updated ? How can a view be made non-updateable ?

(c) (i) Discuss the commit and rollback statement in SQL.

(ii) Consider schedule S_3 given below. Determine whether it is cascadeless, recoverable or non-recoverable.

S_3 : R_1 (P); R_2 (R); R_1 (R); R_3 (P); R_3 (Q); W_1(P); W_3 (Q); R_2 (Q); W_3 (R); W_2 (Q); C_1; C_2; C_3.

(d) Explain the two-phase locking protocol with the help of an example. What are its disadvantages ? How can these disadvantages be overcome ? What is the benefit of rigorous two-phase locking ?

(e) Describe log-based recovery algorithm to recover from transaction failure.

(f) What do you understand by normalization ? Discuss MVD with some example.

(g) What are cursors in SQL ? Explain with suitable example.

(h) Write a short note on domain calculus.