VIT® UNIVERSITY (Estd u/s 3 of UGC Act 1956)

Final Assessment Test – November 2017

Course: CSE2004 - Database Management Systems

Class NBR(s):0521 / 1343 / 1346 / 1347 / 1348 / 1349 / 1350 / 1351 / 1352 / 1353 / 1354

Slot: D1

Time: **Three Hours**

Max. Marks: **100**

Answer any TEN Questions
(10 X 10 = 100 Marks)

1. a) Discuss about any 5 disadvantages of file-processing system? [5]

    b) What are the main characteristics of database approach? [5]

2. Although you always wanted to be an artist, you ended up being an expert on databases. Your old love is still there, however, so you set up a database company, Art Base that builds a product for art galleries. The core of this product is a database with a schema that captures all the information that galleries need to maintain. [10]

    Galleries keep information about artists, their names (which are unique), birthplaces, age, and style of art. For each piece of artwork, the artist, the year it was made, its unique title, its type of art (e.g., painting, lithograph, sculpture, photograph), and its price must be stored. Pieces of artwork are also classified into groups of various kinds, for example, portraits, still lifes, works by Picasso, or works of the 19th century; a given piece may belong to more than one group.

    Each group is identified by a name (like those just given) that describes the group. Finally, galleries keep information about customers. For each customer, galleries keep that person's unique name, address, total amount of dollars spent in the gallery (very important!), and the artists and groups of art that the customer tends to like.

    Draw the ER diagram for the database.

3. a) Discuss with an example about the constraint violations while performing insert and update operation. [5]

    b) Explain the ER relational mapping strategy with an example for [5]
        i. Multivalued attribute
        ii. N-ary relationship

4. Consider the health history report table given below and normalize it to 3NF. [10]

Pet id	Pet name	Pet type	Pet age	Owner	Visit date	Procedure number	Procedure Name
24	Rover	Dog	12	Sam Cock	Jan 13/17	01	Rabies Vaccination
					Mar 27/17	10	Examine and Treat Wound
					Apr 02/17	05	Heart Worm Test
29	Spot	Dog	2	Terry Kim	Jan 21/17	08	Tetanus Vaccination
					Mar 10/17	05	Heart Worm Test
34	Moris	Cat	4	Sam Cook	Jan 23/17	01	Rabies Vaccination
					Jan 13/17	01	Rabies Vaccination
51	Twed	Bird	2	Terry Kim	Apr 30/17	20	Annual Check up
					Apr 30/17	12	Eye Wash

5. Verify which among the following decompositions of R(ABCDE) are lossless or lossy by applying the test for lossless join property. $F = \{AB \rightarrow C \mid C \rightarrow E \mid B \rightarrow D \mid E \rightarrow A\}$ is the set of functional dependencies on R. [10]

    a) R(ABCDE) is decomposed as $R_1(AB)$, $R_2(ADE)$ and $R_3(BCD)$

    b) R(ABCDE) is decomposed as $R_1(BCD)$, $R_2(ACE)$ and $R_3(BD)$

6. a) Consider the following relations   [5]
    vehicle (reg_no, make, colour)
    Person (eno, name, address)
    Owner (eno, reg_no)
    For the query given below, write relational algebra expression and construct the optimized query tree.
    (step by step tree construction is expected)
    Select eno, name, reg_no From Person, Owner Where Person.eno = Owner.eno and
    Person.name = 'Hari'.

    b) Consider the schedule S given below with three transactions T1, T2, T3 and determine if the schedule   [5]
    is serializable.
    S : r2(A); r1(B);w2(A); r2(B); r3(A);v1(B);w3(A);w2(B)

7. Consider the following relations.   [10]
    Salesman (salesman_id, name, city, commission)
    Customer (customer_id, cust_name, city, grade, salesman_id)
    Orders (ord_no, purch_amt, ord_date, customer_id, salesman_id)
    Identify the key attributes and write the following queries in SQL.
    a) Prepare a list with salesman name, customer name and their cities for the salesmen and customer
       who belongs to same city.
    b) Display all the orders from the orders table issued by the salesman 'Paul Adam'.
    c) Display all the orders whose values are greater than the average order value for 10th October 2012.
    d) Count the customers with grades above New York's average.
    e) Display those customers who neither belongs to the city New York nor grade value is more than 100.

8. Describe in detail about variations of the two-phase locking protocol? Why is strict or rigorous two-phase   [10]
    locking often preferred?

9. Write notes on deferred update and explain in detail about deferred update in a single user and multi user   [10]
    environment?

10. Insert the keys given below in the order stated into an initially empty B-tree of order 3. Show all   [10]
    intermediate steps.
    ɤ ɓ ʎ ʃ ʎ ɗ ʎ ɱ ʎ ɟ ʃ ʎ ɤ

11. State the difference between primary index and secondary index. Give an example for each.   [10]

12. Write notes on the following: [10]
    a) Graph databases
    b) Document databases

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