END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY 2017

Paper Code: MCA-108   Subject: **Database Management System**

Time: 3 Hours   Maximum Marks: 75

Note: Attempt any five questions including Q.no.1 which is compulsory.
Select one question from each Unit.

Q1 (a) Write three advantages of DBMS over file system.   **(2.5x10=25)**
    (b) Explain the concept of a weak entity set. How does its candidate key is computed?
    (c) What do you mean by DDL commands in SQL? Do they autocommit?
    (d) How does a where clause is different from a having clause in SQL?
    (e) What do you mean by triggers in database system?
    (f) Write ACID properties of a transaction?
    (g) Explain conflict operations concurrent transaction execution.
    (h) If the primary key of a relation schema R has one attribute in it, in which normal form this scheme R at least will be? Justify your answer.
    (i) What do you mean by an object identifier? What is the role of a persistent class?
    (j) How does an index in created using SQL command? Explain the role of indexing in a file.

Unit-I

Q2 (a) What do you mean by a relation schema? How is it different from an instance and who is responsible for schema design in a database? Further, explain various types of database languages.   **(6)**
    (b) What are various database users? Explain at least three roles of a database administrator.   **(6.5)**

Q3 How does various data constraints are represented in E-R data model? What do you mean by specialization and its various types and draw an ER-diagram to explain this concept.   **(12.5)**

Unit-II

Q4 Consider the following relational scheme: **(2.5x5=12.5)**
    Books(Book_id, B_name, Author, Purchase_date, Cost)
    Members(Member_id, M_name, Address, Phone, Birth_date)
    Issue_Return(Book_id, Member_id, Issue_date, Return_date)

    Specify the following queries in SQL:-
    (a) Find the names of all those books that have not been issued.
    (b) display the member ids and the number of books issued to that member.
    (c) Find the book that has been issued maximum number of times.
    (d) Display the names and authors of books that have been issued at any time to a member whose member id is M1.
    (e) List the book ids of all books that have been issued to any member whose date of birth is less than 01-02-1981.

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P-1/2

Q5 (a) Specify various integrity constraints applicable on relational model. **(6)**
(b) Consider the following relations:

Student (<u>ssn</u>, name, address, major)
Course (<u>code</u>, title)
Registered (<u>ssn, code</u>)

Specify the following queries in Relational Algebra

(i) List the codes of courses for which no student is registered. **(2)**
(ii) Names of student and the titles of courses they registered to. **(2.5)**
(iii) SSNs of students who are registered for both 'Database Systems' and 'Analysis of Algorithms'. **(2)**

Unit-III

Q6 (a) Explain various aggregate function used in SQL using suitable example. **(6)**
(b) What do you mean by a table space? Explain its various types. **(6.5)**

Q7 Describe oracle architecture in brief and also explain components of physical database structure and logical data structure. **(12.5)**

Unit-IV

Q8 (a) What are various anomalies that can be found in a badly designed database, explain with suitable examples. Explain with suitable example that BCNF is stronger than 3NF. **(6)**
(b) Explain various transparencies that are found in a distributed database system. Also define various types of fragmentation used to implementation distributed database. **(6.5)**

Q9 (a) Explain the concept of conflict and view serialization schedules. Give a suitable example to show that view serializability is less stringent than conflict serializability. **(6)**
(b) Define a functional dependency. Write Armstrong's axioms for computation of closure of a set of functional dependencies. How can you identify a candidate key of a relation using closure of a set of attribute? **(6.5)**

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