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CA 132302 NR

Roll No. of candidate

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M.C.A. 3rd Semester End-Term Examination

DATABASE MANAGEMENT SYSTEM

(New Regulation (w.e.f. 2017-18))

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Choose the correct answer : (10 × 1 = 10)
- (i) Architecture of a database
- (a) Has three levels (b) Has two levels
(c) Has multi level (d) None of the above
- (ii) In relational database relations are termed as
- (a) Tuple (b) Attribute
(c) Table (d) Row
- (iii) Cartesian product is
- (a) Unary operation (b) Binary operation
(c) Ternary operation (d) All
- (iv) An entity type note having primary key is
- (a) Weak entity type (b) Strong entity type
(c) Simple entity type (d) Primary entity type
- (v) In case of entity integrity Primary key
- (a) May be null (b) May not be null
(c) May be null or not null (d) None of the above
- (vi) If $X \rightarrow YZ$, $W \rightarrow X$ then
- (a) X is a candidate key (b) Y is a candidate key
(c) Z is candidate key (d) W is candidate key

[Turn over

(vii) Creation of a table is a

- (a) DDL
- (b) DML
- (c) DCL
- (d) None of the above

(viii) Which one is the most efficient searching technique

- (a) Binary search
- (b) Sequential search
- (c) Hashing
- (d) None of the above

(ix) Relational Algebra is

- (a) Procedural language
- (b) Non procedural language
- (c) 4th generation language
- (d) Schema language

(x) Alter statement

- (a) Alter table
- (b) Alter view
- (c) Alter Row
- (d) None of the above

2. (a) Define primary key, superkey, prime attribute? (6)
- (b) What is logical data independence. Give example. (4)
- (c) Why concurrency control is needed in a multi user database environment explain with examples. (5)

3. Suppose you are having many items in your kitchen room. You want to design a database for storing the item details of your kitchen, where,

- (a) You want to keep the records as item code, item name, item type, quantity on hand, weight, item state etc.
- (b) Moreover, you want to keep the record of inventory of the items, such as, purchase records of the items (datewise with quantity).
- (c) Moreover you want to keep the use of the items when it is used (datewise with quantity).
 - (i) Find the entity and attributes draw an ER diagram for the system. (8)
 - (ii) Convert the diagram in relational schema. (7)

4. Consider the following Tables

EMP (empno, ename, job, hiredate, mgr, sal, comm, deptno)

DEPT (deptno, dname, loc. dmgr)

PROJ(pno, pname, date, status)

EMPPROJ (empno, pno, joindate, leavingdate, status)

Write SQL statements for

- (a) Find out the employees who joined before the date '01-01-2020'. (3)
- (b) Find out the employees who have no commissions (3)
- (c) Find out the employees who works in department no 20 but not having salary more than 10000. (3)

Write relational algebra expression for:

- (d) Find out the employee names and their department names. (3)
 - (e) Find out empno, ename, job who are working in department no. 10 or 20. (3)
5. (a) What do you mean by binary lock and R/W locks? Give examples. (5)
- (b) Explain the ACID properties. (5)
- (c) What is transaction log? Why it is needed. (5)
6. (a) What do you mean by Client server architecture? Discuss 2-tier and 3 tier architecture with labelled diagram. (9)
- (b) Discuss three schema architecture of database systems. (6)

7. Write short notes on: (3 × 5 = 15)

- (a) Client Server Architecture
- (b) Object data model
- (c) Aggregate functions in SQL.