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END SEMESTER EXAMINATION
NOVEMBER–2019

Semester : 5th (New)

Subject Code : CO-503

DATABASE MANAGEMENT SYSTEMS

Full Marks – 70

Time – Three hours

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

Instructions :

1. Questions on PART–A are compulsory.
2. Answer any *five* questions from PART-B.

PART – A
Marks – 25

1. Fill in the blanks : 1×10=10

   (a) Relational data model is an example of ——— data model.

   (b) The description of the database is termed as database ———.

[Turn over

(c) The capacity to change the schema at one level without changing the schema at the next higher level is termed as ———.

(d) COUNT, SUM, MAX are ——— functions in SQL.

(e) Depending on number of cites, DBMS's are classified as ——— or ———.

(f) A DBMS is a collection of ——— that enables users to create and maintain a database.

(g) Entities, attributes and relations are the concepts used in ——— model.

(h) BC in BCNF stands for ———.

(i) Wait-die and Wound-wait is associated to ———.

(j) DCL stands for ———.

2. Write true or false : 1×10=10

(a) A database is a collection of related or unrelated data.

(b) Physical data models provide concepts related to data actually stored in storage medium.

(c) The SELECT clause is a DDL statement.

(d) Insulation between programs and data is possible in traditional file processing approach.

(e) There are four types of participation constraints.

(f) Binary locking can lead to deadlock.

(g) Name attribute is a derived attribute.

(h) A transaction can be in one of the four states.

(i) A system log is essential for recovery.

(j) UPDATE in SQL is used to add or delete an attribute to the table.

3. Choose the correct answer : 1×5=5

(a) Full functional dependency is related to

(i) 1NF (ii) 2NF

(iii) 3NF (iv) BCNF

(b) GRANT in SQL is a

(i) SDL (ii) DDL

(iii) DML (iv) VDL

(c) Fragmentation and Replication are associated to

(i) Transaction processing

(ii) Concurrency control

(iii) Security

(iv) Distributed databases

(d) An entity that does not have a primary key is termed as

(i) Strong entity (ii) Simple entity

(iii) Weak entity (iv) None of these

(e) Foreign key is associated with ———— constraint.

(i) Domain (ii) Key

(iii) Entity Integrity (iv) Referential Integrity

PART – B

Marks – 45

4. (a) Define data model. 1+2=3

(b) Explain the concept data independence. 3

(c) State the properties of a transaction. 3

5. (a) State the advantages of the database approach. 3

(b) Define the terms normalisation and de-normalisation. 2+1=3

(c) State the functions of a DBA. 3

6. (a) Explain the database system using a suitable diagram. 3

(b) Write SQL statements to

(i) Create a table with fname, lname, Age and Contact making Contact as the primary key.

(ii) Retrieve all the tuples whose name starts with the alphabet 'T'. 1½+1½=3

(c) To the above table,

(i) add an attribute salary and

(ii) retrieve fname and lname whose salary is less than average salary. 1+2=3

7. (a) Explain the three schema architecture. 3

(b) Define functional dependency. 2

(c) State briefly the different ways DBMS's can be classified. 4

8. (a) Explain the terms mandatory and discretionary security mechanisms in database management. 2½+2½=5

(b) Explain the differences in the traditional file processing and database approach. 4

9. (a) Illustrate the binary and shared locking techniques. 2+2=4

(b) Draw an E-R model with three entities– Student, Faculty and Department. (Assume three attributes for each, show the primary attribute and the relationships. Show the cardinality ratios and the participation constraints and justify every assumption.) 5

10. Write short notes on any *three* : 3×3=9

(a) Concurrency control in distributed database

(b) Transaction Operations

(c) Deadlock and Starvation

(d) Schedules and Serializability

(e) Normal Forms.