Total No. of printed pages = 7

END SEMESTER EXAMINATION – 2021

Semester : 5th

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. *All* questions of 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) When one column of a table refers to the values in another column of the same table, it introduces a _____ integrity constraint.

[Turn over

(b) The term serializability is related to _____ _____.

(c) DBMS is a collection of _____.

(d) In SQL the _____ function calculates the number of tuples specified in the query.

(e) Participation constraint can be _____ or _____.

(f) Wait-die and Wound-wait are associated to _____ _____.

(g) DCL stands for _____ _____ _____.

(h) Data about data is termed as _____.

(i) The _____ key uniquely identifies the tuples in a relation.

(j) The structure of a database is termed as _____.

2. State true or false : 1×10=10

(a) Transactions are terminated by TERMINATE command.

(b) Oracle is a RDBMS.

(c) Conceptual data models provide concepts related to data actually stored in storage medium.

(d) A system log is essential for recovery.

(e) Inner Joins connects tables and displays records having matching values.

(f) A table can be deleted without deleting the data in the table.

(g) Program data independence is associated with database approach.

(h) If a relation is in 3NF, then it is also in BCNF.

(i) In an E-R diagram multivalued attribute is represented by oval.

(j) Query optimization is a part of the database system environment.

3. Choose the correct option : 1×5=5

(a) Authentication means

(i) restricting access to the system

(ii) controlling access to database

(iii) Both (i) and (ii)

(iv) None of the above

(b) Which of the following is record based data model ?

(i) E-R model

(ii) Hierarchical data model

(iii) Relational data model

(iv) None of the above

(c) Foreign key is associated with ____ constraint.

(i) Domain

(ii) Key

(iii) Entity integrity

(iv) Referential integrity

(d) Which of the following is an aggregate function in SQL ?

(i) Union (ii) Like

(iii) Group by (iv) Max

(e) Full functional dependency is related to _____.

(i) 1NF (ii) 2NF

(iii) 3NF (iv) BCNF.

PART – B

Marks – 45

4. (a) State the different classification of DBMSs. 3

   (b) Explain the three schema architecture with a diagram. 3+2=5

   (c) ANSI stands for what ? 1

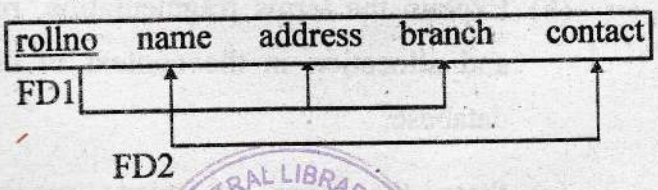
5. (a) Explain the concepts used in E-R model. 5

   (b) Define data model. 2

   (c) State the components of a database system. 2

6. (a) Consider the following relation and the FDs

   STD



(i) Is this relation in 2NF ? Yes or No. If no then decompose to 2NF. 1+2=3

(ii) Is this relation in 3NF ? Yes or No. 1

(b) Define functional dependency. 2

(c) State the different properties of a transaction. 3

7. (a) Explain the different concurrency control techniques. 6

(b) What is a system log ? 2

(c) Define schedule. 1

8. (a) State the advantages of a distributed database. 2

(b) Explain the terms fragmentation, replication and allocation in the context of distributed database. 5

(c) State the steps of query processing in distributed database. 2

9. (a) What are the different security mechanisms implemented to secure a database ? State the different types of measures taken in this area. 3+4=7

(b) Explain the different functions of a DBA in the context of security implementation. 2

10. (a) Define deadlock and state some deadlock prevention measures. 1+3=4

(b) Explain the different types of DBMS interfaces. 2

(c) Differentiate between the centralised and client / server architecture of DBMS. 3