Code : 051509

B.Tech 5th Semester Exam., 2018

DATABASE SYSTEM

Time : 3 hours   *Full Marks* : 70

Instructions :

(i) *The marks are indicated in the right-hand margin.*

(ii) *There are **NINE** questions in this paper.*

(iii) *Attempt **FIVE** questions in all.*

(iv) *Question No. **1** is compulsory.*

1. Choose the correct answer (any *seven*) :   2×7=14

   (a) Data model is collection of conceptual tools for describing

      (i) data

      (ii) data schema

      (iii) consistency constraints

      (iv) All of the above

   (b) Data models in DBMS are classified into —— categories.

      (i) 3   (ii) 4

      (iii) 5   (iv) 2

(2)

   (c) Object-based logical models are used to describe data at

      (i) logical level

      (ii) view level

      (iii) physical level

      (iv) None of the above

   (d) The term ____ is used to refer to a row.

      (i) attribute

      (ii) tuple

      (iii) field

      (iv) instance

   (e) What is an instance of a database?

      (i) The logical design of the database system

      (ii) The entire set of attributes of the database put together in a single relation

      (iii) The state of the database system at any given point of time

      (iv) The initial values inserted into the database immediately after its creation

(f) What is a foreign key?

   (i) A foreign key is a primary key of a relation which is an attribute in another relation

   (ii) A foreign key is a superkey of a relation which is an attribute in more than one other relations

   (iii) A foreign key is an attribute of a relation that is a primary key of another relation

   (iv) A foreign key is the primary key of a relation that does not occur anywhere else in the schema

(g) To include integrity constraint in an existing relation use

   (i) create table

   (ii) modify table

   (iii) alter table

   (iv) drop table

(h) Which of the following is not an integrity constraint?

   (i) Not null

   (ii) Positive

   (iii) Unique

   (iv) Check 'predicate'

5. Consider the universal relation

   $R = \{A, B, C, D, E, F, G, H, I\}$ and the set of functional dependencies

   $$F = \{(A, B)\} \rightarrow \{C\},$$
   $$\{A\} \rightarrow \{D, E\},$$
   $$\{B\} \rightarrow \{F\},$$
   $$\{F\} \rightarrow \{G, H\},$$
   $$\{D\} \rightarrow \{I, J\}$$

   What is the key for R? Decompose R into 2NF, then 3NF relations.   14

6. (a) Explain the different integrity constraints in database system with the help of example.   7

   (b) Briefly explain the ACID property of database system.   7

7. (a) Explain the select, project join and division with the help of example.   7

   (b) Explain the immediate update and deferred update of recovery techniques.   7

8. (a) What are multivalve and join dependencies in the database system? Explain with the help of example.   7

   (b) What do you mean by concurrent execution and serializability in database system?   7

9. Write short notes on any *two* of the following : 7×2=14

(a) ER models

(b) SQL and embedded SQL

(c) Referential integrity in database

(d) Query optimization

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