Code : 051509

B.Tech 5th Semester Exam., 2015

DATABASE SYSTEMS

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. Answer any *seven* of the following as directed : 2×7=14

(a) What is data abstraction?

(b) Which of the following schemas defines a view or views of the database for particular users?

(i) External

(ii) Internal

(iii) Conceptual

(iv) None of the above

(Choose the correct answer)

(c) Which of the following schemas defines how and where the data are organized in a physical data storage?

(i) Internal

(ii) External

(iii) Conceptual

(iv) None of the above

(Choose the correct answer)

(d) The number of attributes in a relation is called the _____ of the relation. degree

(Fill in the blank)

(e) In E-R diagrams, _____ are underlined. Primary key

(Fill in the blank)

(f) The arrow notation (→) in FD is read as _____. dependent

(Fill in the blank)

(g) 4 NF is violated when a relation has undesirable multivalued attribute

(Fill in the blank)

(h) During the query processing, the syntax of the query is checked by _____.

(Fill in the blank)

(Continued)

(i) Which of the following is validation-based concurrency control?

(i) Validation

(ii) Write

(iii) Read

(iv) All of the above

(Choose the correct answer)

(j) Locking can be done at which level?

(i) Page level

(ii) Row level

(iii) Database level

(iv) All of the above

(Choose the correct answer)

2. (a) Who is a DBA? What are the responsibilities of DBA? 7

(b) Describe the main components of a DBMS. 7

3. (a) With example, explain how relationship and weak entities of an E-R diagram are reduced/mapped to tables. 7

(b) Draw an E-R diagram for your college. 7

4. (a) Define the structure of well-formed formula (WFF) in both the tuple relational calculus and domain relational calculus. 7

(b) What do you mean by structure of a relational model of database system? Explain the significance of domain and keys in the relational model. 7

5. (a) With example, explain superkey, candidate key, primary key and foreign key. 7

(b) What is the role of cursor in embedded SQL? Explain how it is used with example. 7

6. (a) What do you mean by assertion? Explain. 7

(b) What is functional dependency? Explain its types. 7

7. (a) Compare 3 NF with BCNF. 7

(b) Explain 4 NF. 7

8. (a) What are the typical phases of query processing? With a sketch, discuss these phases in high-level query processing. 7

(b) Explain how heuristic query optimization is performed with an example. 7

9. (a) What is serializability? Explain view serializability. 7

(b) What are ACID properties of a database transaction? Discuss each of these properties. How do they relate to the concurrency control? Give example to illustrate your answer. 7

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