

B.Tech. 5th Semester Exam., 2014

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. Choose the correct answer (any seven) : $2 \times 7 = 14$

(a) Which of the following is true regarding files?

- (i) Databases and fields
- (ii) Fields and records
- (iii) Databases and records
- (iv) Records and sorts

(b) What is the purpose of project operation?

- (i) It selects certain columns
- (ii) It selects certain rows
- (iii) It selects certain strings
- (iv) It selects certain integers

(c) Which of the following normal forms is considered for normal relational database design?

- (i) 1st
- (ii) BCNF
- (iii) 2nd
- (iv) 3rd

(d) The weak entity set does not have sufficient attributes to form

- (i) primary key
- (ii) candidate key
- (iii) Both (i) and (ii)
- (iv) superkey

(e) Which of the following is false about the DML?

- (i) It refers to data using physical addresses
- (ii) It cannot interface with high-level programming language
- (iii) It is used to define the physical characteristics of each record
- (iv) All of the above

(5)

3. (a) Explain the meaning of the existential quantifier and universal quantifier with examples.
- (b) How are aliases used in SQL queries? What is the purpose of using an alias? 7+7=14
4. Consider the following relational database in which CName is a company name :
- Lives (Name, Street, City)
Works (Name, CName, Salary)
Located-in (CName, City)
Manages (Name, Manager-name)
- Formulate the following queries in SQL : 5+5+4=14
- (a) Find the name of all people who work for ABC Bank.
- (b) Find the Name, Street and City of all people who work for ABC Bank and earn more than ₹ 55,000.
- (c) Find all people who live in the same city and on the same street as their manager.
5. (a) What are top-down and bottom-up approaches to database design?
- (b) Explain the reasons for the update, insertion and deletion anomalies. 7+7=14

6. (a) Describe the characteristics of a table that is not in normalized form. Describe how much such a table is converted to a first normal form relation.
- (b) What do you understand by attribute closure? Give an example. 7+7=14
7. (a) What is the importance of query optimization? What is its objective?
- (b) Describe the different steps of query processing. Are these the same steps of a procedural language compiler? Explain. 7+7=14
8. (a) Explain how query parsing is carried out in a DBMS.
- (b) Describe the basic approach used in cost-based query optimization used in system R. 7+7=14
9. (a) List the properties that a transaction must have. Briefly explain them.
- (b) When do two transactions running concurrently conflict? Explain RW and WW conflicts. 7+7=14

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