G 7129 (Pages : 3) Reg. No.....1.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

DATABASE MANAGEMENT SYSTEMS (R,T)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer all *questions*
Each question carries 4 *marks.*

1. Mention the responsibilities of various users in a Database environment.
2. What is the difference between physical data independence and logical data independence ? Which is easier to accomplish ? Why ?
3. Write a query for the following : —
   (a) Retrieve the second maximum salary from employee table.
   (b) Retrieve the employees who earn more than the average salary of the department.
   (c) Retrieve the employees who earn more than the average salary in their respective department.
   (d) Retrieve the employees who earn more than the total salary earned by the employees whose name starts with "R".
4. Define the following terms with respect to the tuple calculus : tuple variable, range relation, atom, formula.
5. Illustrate how concurrency control plays an essential role in Database system.
6. Describe the desirable properties of transaction.
7. Discuss the problem(s) which may be associated with a relation that is in 4NF but not 5NF with the help of an example. Define the term 5NF.
8. Describe the term Multivalued Dependency in the context of relational database management system by giving an example.
9. What additional functions does a DDBMS have over a centralized DBMS ? What are the main software modules of a DDBMS ?
10. What is a fragment of a relation ? What are the main types of fragments ? Why is fragmentation a useful concept in distributed database design ?

(10 × 4 = 40 marks)

Turn over

Part B

Each question carries 12 *marks.*

11. (a) (i) Discuss the main characteristics of Database system over traditional file processing system. (8 marks)

(ii) Distinguish the following attributes : —

(a) Simple Vs Composite.

(b) Single-valued Vs Multi-valued.

(c) Stored Vs Derived.

(4 marks)

Or

(b) A database is to be designed for an organisation to monitor its activity. The organisation consists of a number of departments. Each department has employees working for it. No employee can work for more than one department. Each department uses parts in certain quantities. Each department also maintains the information about the suppliers of parts. Each department is identified by its number and has budget and a place of operation. Employees are identified by its number and have a salary and designation. Construct the ER diagram for above problem description. Assume reasonable relationship between concepts in real world.

12. (a) Describe the operations of relational algebra with example for each.

Or

(b) (i) Describe the basic data types for attributes in SQL. (5 marks)

(ii) How does SQL allow implementation of the entity integrity and referential integrity constraints ? Explain with example.

(7 marks)

13. (a) Explain how serializability can be achieved, using time stamp ordering of transactions.

Or

(b) Write a PL/SQL program to create a function create-dept. to accept the department name and location as input and the department code should be generated through sequence and a record should be inserted into department table. Also return the newly generated department code.

14. (a) (i) Explain 1NF, 2NF and 3NF by taking suitable examples. (7 marks)

(ii) Define BCNF. How does it differ from 3NF ? Explain by taking suitable example.

(5 marks)

Or

(b) (i) Explain different types of anomalies in connection with relations. (7 marks)

(ii) What is functional dependency ? Explain with an example. (5 marks)

15. (a) Explain Data fragmentation, Replication techniques for a DDBMS.

Or

(b) Write notes on the following : —

(i) Degree of homogenity of a DDBMS.

(ii) Fragmentation transparency.

(iii) Distribution transparency.

(5 × 12 = 60 marks)