Reg. No. : | | | | | | | | | | |

Question Paper Code: 31085

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Third Semester

Information Technology

01UIT305 - DATABASE SYSTEMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What do you mean by a weak entity set?
2. List the disadvantages of file systems.
3. What is a trigger?
4. Let *R* and *S* be the two relations. Rewrite the intersection operation ($R \cap S$) with a pair of set difference operations.
5. What are the types of functional dependencies? Given an example for each type.
6. State the goals of database design with functional dependencies.
7. Write notes on Thomas' Write rule.
8. How will you ensure the integrity of the data? What are the transaction properties that the database system should maintain?
9. If you have data that should not be lost on disk failure, and the data are write intensive, how would you store the data?
10. What is the primary distinction between B tree index and B+ tree index?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Describe the architecture for a database system in detail with a neat diagram. (10)

(ii) What are the five main functions of a database administrator? (6)

Or

(b) Specify the different notations of E-R model and describe the various steps in E-R design by constructing an E-R diagram for a hospital management system to capture the requirements as stated below: In a hospital there are different departments. Patients are treated in these departments by the doctors assigned to patients. Usually each patient is related by a single doctor, but in rare cases they will have two or three. Healthcare assistants will also attend to patients; every department has many healthcare assistants. Each patient is required to take a variety of drugs during different parts of the day such as morning, evening and night. (16)

12. (a) (i) List the fundamental relational algebra operations. Explain each operator in detail by writing the relational algebra expressions. (12)

(ii) Create a trigger to implement referential integrity policy – "on delete set null' in the employee table. That is when a department _id is deleted from the department table, set null for deleted department number in employee table. (4)

Or

(b) (i) Consider the following table and give an expression in SQL for each of the following queries.

Employee **(**Empnumber, Empname, Job, Manager, Hiredate, Salary, Commission)

Department **(**Depnumber, Depname, Location)

(1) Give a 15% of salary as commission to all classes.

(2) List the employee whose names have '*a*' as second letter.

(3) Display the details of the employee name and id, department name for all the employees and include the department which has no employee.

(4) Display the details of the employee name and id, department name for all the employees and include the department which has been assigned any department.

(5) Display number of employee working under each manager. Display the result in descending order of number of employee. (10)

(ii) Write short notes on Dynamic SQL. (6)

13. (a) (i) What are the main goals of database design with functional dependency? (6)

(ii) Suppose you are given a relation $R = (A, B, C, D, E)$ with the following functional dependencies: $\{CE \rightarrow D, D \rightarrow B, C \rightarrow A\}$.

(1) Find all candidate keys.

(2) Identify the best normal form that R satisfies *(1NF, 2NF, 3NF, or BCNF).*

If the relation is not in BCNF, decompose it until it becomes BCNF. At each step, identify a new relation, decompose and re-compute the keys and the normal forms they satisfy. (10)

Or

(b) (i) What is normalization? Why do we need normalization? (4)

(ii) Describe functional dependency theory in detail. (12)

14. (a) Explain the three concurrency control techniques without locking in detail. (16)

Or

(b) Give a detailed description on the following:

(i) Performance of locking (8)

(ii) ACID properties (8)

15. (a) Write short notes on

(i) Variable – length records (8)

(ii) Organization of records in Files (8)

Or

(b) (i) What are the index evaluation metrics? Describe in detail. (6)

(ii) Explain in detail about the B + tree index files. (10)

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