Reg. No. :

Question Paper Code: 41385

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Information Technology

14UIT305 - DATABASE SYSTEMS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In a one-to-many relationship, the entity that is on the one side of the relationship is called a(n) _____ entity.

    (a) parent   (b) child   (c) instance   (d) subtype

2. Which of the following refers to something that can be identified in the users' work environment, something that the users want to track?

    (a) Entity   (b) Attribute   (c) Identifier   (d) Relationship

3. A _____ is a stored program that is attached to a table or a view.

    (a) pseudo file   (b) embedded SELECT statement
    (c) trigger   (d) none of these

4. SQL views can be used to hide

    (a) columns and rows only   (b) complicated SQL syntax only
    (c) both (a) and (b)   (d) none of these

5. Database redesign is not terribly difficult if the

    (a) database is structured   (b) database is well-designed

      (c) database has no data   (d) database is relatively small

6. Which level of RAID refers to disk mirroring with block striping?

    (a) RAID level 1   (b) RAID level 2

    (c) RAID level 3   (d) RAID level 0

7. A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.

    (a) Idle   (b) Waiting   (c) Deadlock   (d) Ready

8. The deadlock in a set of transaction can be determined by

    (a) Read-only graph   (b) Wait graph

    (c) Wait-for graph   (d) All the above

9. Which of the following makes the transaction permanent in the database?

    (a) View   (b) Commit   (c) Rollback   (d) Flashback

10. In order to undo the work of transaction after last commit which one should be used?

    (a) View   (b) Commit   (c) Rollback   (d) Flashback

PART - B (5 x 2 = 10 Marks)

11. Discuss the usage of a semi structured data model.

12. Define materialized views with an example.

13. When a relation schema is said to be in forth normal form?

14. Define the usage of a snapshot isolation technique.

15. Mention the difference between storage area network and network attached storage.

PART - C (5 x 16 = 80 Marks)

16. (a) Describe in detail about view of data with a diagram.   (16)

Or

2

41385

(b) Design an Entity Relationship (ER) model for a college database:

- A college contains many departments
- Each department can offer any number of courses
- Many instructors can work in a department
- An instructor can work only in one department
- For each department there is a Head
- An instructor can be head of only one department
- Each instructor can take any number of courses
- A course can be taken by only one instructor   (16)

17. (a) employee (<u>person-name</u>, street, city)

works (<u>person-name</u>, company-name, salary)

company (<u>company-name</u>, city)

manages (<u>person-name</u>, manager-name)

For the above relational database where the primary keys are underlined, give an expression in the relational algebra to express each of the following queries:

- Find the names of all employees who work for First Bank Corporation.
- Find the names and cities of residence of all employees who work for First Bank Corporation.
- Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.
- Find the names of all employees in this database who live in the same city as the company for which they work.
- Find the names of all employees who live in the same city and on the same street as do their managers.
- Find the names of all employees in this database who do not work for First Bank Corporation.   (16)

Or

(b) Demonstrate in detail about the structure of SQL queries.   (16)

18. (a) Interpret the following concepts with suitable definitions

(i) Lossless decomposition   (8)

(ii) Dependency preservation   (8)

Or

41385

(b) A engineering consultancy firm supplies temporary specialized staff to bigger companies in the country to work on their project for certain amount of time. The table below lists the time spent by each of the company's employees at other companies to carry out projects. The National Insurance Number (NIN) is unique for every member of staff.

NIN	Contract No	Hours	Employee Name	Company ID	Company Location
616681B	SC1025	72	P. White	SC115	Belfast
674315A	SC1025	48	R. Press	SC115	Belfast
323113B	SC1026	24	P. Smith	SC23	Bangor
616681B	SC1026	24	P. White	SC23	Bangor

    (a) Explain in which normal form this table is.

    (b) Find the Primary Key for this relation and explain your choice.

    (c) Find the Fully Functional Dependencies on the PK and the Partial Dependencies on the PK. (16)

19. (a) Explain transaction concepts with a simple transaction model. (16)

Or

(b) Describe in detail about the

    (i) Deadlock detection (8)

    (ii) Recovery from deadlock (8)

20. (a) Explain in detail about RAID. (16)

Or

(b) Explain B Trees and calculate the order p of a B-Tree stored on disk. (16)

————————————

41385