Total No. of Questions : 10]

SEAT No. :

P3626

[Total No. of Pages : 3

[5560]-582
T.E. (Computer Engineering)
DATA BASE MANAGEMENT SYSTEM
(2015 Pattern) (Semester - I)

Time : 2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4 Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Consider following schema: **[5]**

account (acct-no, branch - name, balance)
Depositor (cust - name, acct - no)
borrower (cust-name, loan-no)
loan (loan - no, branch - name, amount)
Write following queries using SQL (any 2)
i) Find names of all customers who have a loan at the Redwood branch.
ii) Find all customers who are having an account and loan or both.
iii) Find average account balance at each branch.

b) Define DBMS. Explain advantages of DBMS over file system. **[5]**

OR

Q2) a) For the database system to be usable, it must retrieve data efficiently. The need of efficiency has led designers to use complex data structures to represent data in the database. Developers hide this complexity from the database system users through several levels of abstraction. Explain those levels of abstraction in detail. **[5]**

b) Write a PL/SQL block for following requirement and handle the exceptions. **[5]**

Roll no. of student will be entered by user. Attendance of roll no. entered by user will be checked in Student table. If attendance is less than 75% then display the message "Term not granted" and set the status in Student table as "D". Otherwise display message "Term granted" and set the status in Student table as "ND".

P.T.O.

Q3) a) It is easy to create index on all attributes of any relation, why it is not recommended to create index on all attributes? **[5]**

b) Write PL/SQL code block that raise a user defined exception when business rule is violated. Business Rule for client - master table specifies when the value of bal - due field is less than 0 handle the exception. **[5]**

OR

Q4) A university registrar's office maintains data about the following entities: **[10]**

- courses, including number, title, credits, syllabus, and prerequisites;
- course offerings, including course number, year, semester, section number,
- instructor(s), timings, and classroom;
- Students, including student-id, name, and program; and
- instructors, including identifiation number, name, department and title

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

a) Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

b) Construct appropriate tables for E-R diagram designed with above Requirements.

Q5) a) To ensure atomicity despite failures we use Recovery Methods, Explain in detail Log-Based Recovery method. **[8]**

b) What benefit does rigorous two-phase locking provide? How does it compare with other forms of two - phase locking? **[9]**

OR

Q6) a) State and explain the ACID Properties. During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain the situations when each state transition occurs. **[8]**

b) Suppose a transaction T_i issues a read command on data item Q. How time - stamp based protocol decides whether to allow the operation to be executed or not using time - stamp based protocol of concurrency control. **[9]**

Q7) a) For concurrency control in distributed transaction distributed lock manager approach is used: explain in detail different approaches for dealing with replication of data items in distributed lock manager approach. **[8]**

b) Describe Two Phase Commit (2PC) protocol. Explain how 2PC protocol responds in different ways to various types of failures like site failure, coordinator failure and network partition. **[9]**

OR

Q8) a) Explain Data Replication and Data Fragmentation in Distributed Data Storage. **[8]**

b) Explain in details two important issues Speedup and Scale up in Parallel Databases. Also explain which factors work against efficient parallel operation and can diminish both speedup and scaleup. **[9]**

Q9) a) List the different NOSQL data Models. Explain document store NOSQL data model with example. **[8]**

b) Explain the CAP theorem referred during the development of any distributed application. **[8]**

OR

Q10)a) Analyze the use of NoSQL databases in current social networking environment also explain need of NoSQL databases in social networking environment over RDBMS. **[8]**

b) BASE Transactions ensures the properties like Basically Available, Soft State, and Eventual Consistency. Explain each property with its significance. How soft state of system is depend on Eventual consistency property. **[8]**

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