

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA. Sem-II Examination July 2010

Subject code: 620006

Subject Name: Database Management System II

Date: 08 / 07 /2010

Time: 11.00 am – 01.30 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) (i) Explain the properties of transaction with example. **07**
(ii) Draw and explain state transition diagram for transaction execution.
- (b) Explain grant and revoke privileges with example for discretionary access control. **07**

- Q.2**
- (a) State whether the following statements are true or false. Justify. No Justification, no marks. **07**
- (1) A firewall is a system designed to prevent unauthorized access to or from a public network.
 - (2) A check point is a point of synchronization between the database and the transaction log file.
 - (3) The assignment and management of memory blocks is called the buffer management.
 - (4) Level 1 transaction is the minimum consistency requirement that allows a transaction to be recovered in the event of system failure.
 - (5) There is no deadlock in the timestamp method of concurrency control.
 - (6) A candidate key is an attribute which can uniquely identify a row in a table.
 - (7) Heuristic rules are used as an optimization technique to modify the internal representation of a query.

- (b) Consider the following relations: **07**
- Suppliers (Sid, S_name, Address)
Parts (Pid, P_name, Colour)
Catalogue(Sid, Pid, Cost)
- The key fields are underlined. Write the following queries in relational algebra.
- 1) Find the names of suppliers who supply some red parts.
 - 2) Find the Pid of parts supplied by every supplier at less than INR 500.
 - 3) Find the Pid of parts that are supplied by at least two different suppliers.
 - 4) Find the Sid of suppliers who supply every part or green part.
 - 5) Find the Sid of suppliers who supply every part.
 - 6) Find the Sid of suppliers who supply some red or green part.
 - 7) Find the Sid of suppliers who supply some red and some green parts.

OR

- (b) Explain union, difference and intersection operation in relational algebra with your own suitable example **07**

Q.3 (a) Explain shadow paging as a technique for Database recovery. List the advantages and disadvantages of shadow paging. **07**

(b) Differentiate between deferred update and immediate update with suitable example. **07**

OR

Q.3 (a) Differentiate between UNDO and REDO types of transaction recovery with suitable example. **07**

(b) Explain optimistic methods of concurrency control with its advantages and disadvantages. **07**

Q.4 (a) Differentiate between parallel and distributed databases. List advantages and disadvantages of Parallel Databases. **07**

(b) Explain in brief the cost components in query execution. **07**

OR

Q.4 (a) Explain heuristic rules for query optimization with your own suitable example. **07**

(b) Explain features, advantages and disadvantages of OODBMS. **07**

Q.5 (a) Explain the problem called 'Dirty read' of Concurrency control with suitable example. **07**

(b) (i) Write a short note on permutable actions. **07**
(ii) Explain 2PL.

OR

Q.5 (a) (i) Explain the concept of deadlock with example. **07**
(ii) Discuss different ways for deadlock prevention and detection.

(b) (i) Explain the concept of timestamp with its properties. **07**
(ii) Explain the concept of granule timestamps.
(iii) Differentiate between authorization and authentication.
