



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(ECE-NEW)/SEM-7/EC-704C/2009-10

2009

DATABASE MANAGEMENT SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : $10 \times 1 = 10$

- i) Data structure of the data stored in a database is dealt by
- a) external schema
 - b) conceptual schema
 - c) internal schema
 - d) varies with different databases.



ii) No. of entities attached with a relationship is called of the relation.

- a) complexity b) cardinality
- c) degree d) functionality.

iii) Multi-valued dependency (MVD) is removed in

- a) 3NF b) 4NF
- c) 5NF d) BCNF.

iv) Four DML commands are

- a) CREATE, UPDATE, DELETE, SELECT
- b) INSERT, UPDATE, DROP, SELECT
- c) CREATE, ALTER, DELETE, SELECT
- d) INSERT, MODIFY, DELETE, SELECT
- e) INSERT, UPDATE, DELETE, SELECT.

v) One of the shortcomings of file system is

- a) data availability
- b) fixed records
- c) sequential records
- d) lack of security.

with FDs :

$$\{ \text{BankID, Account Numb} \not\subset \text{Balance} ;$$

BankID, Account Numb \nsubseteq Customer ;

$$\text{Customer} \not\subset \text{BankID} \}$$

What is the highest normal form for the relation schema Bank ?

- a) First b) Second
- c) Third d) Boyce coed.

vii) Which is not a set operator ?

- UNION
- INTERSECT
- MINUS
- LIKE.

$$F = (JK \oslash L, L \oslash K)$$

a) J and K

b) JK

c) only J

d) JK and JL .

a) Deferred updates b) Immediate update
c) Shadow paging d) None of these.

a) Unary b) Binary

c) Ternary d) Quaternary.

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain the term 'strong and weak relationship'.
3. Explain the concept of a trigger with suitable example. Why is B⁺ tree advantageous over B tree ? 3 + 2
4. What do you mean by integrity constraint ? "Primary key is one type of integrity constraint" — Explain. 2 + 3



5. a) What do you mean by the cardinality of a relationship ?
Explain. 4 + 1
- b) Give example of a composite attribute.
6. a) What is growing and shrinking phase of the two-phase locking protocol ?
- b) What do you mean by granularity of a lock ?
- c) What are the differences between the dense index and the sparse index ? 1 + 2 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is the function of data dictionary ? 3
- b) What do you mean by serializability ? 3
- c) What is two-phase locking protocol ? 3
- d) Draw an ERD for banking system. 6
8. a) Define phantom deadlock. 3
- b) Describe different deadlock detection techniques. 3
- c) What is hashing ? 3



- d) What are the advantages of embedded SQL program ? 3
- e) What are different types of join operation ? 3
9. a) Consider the following relational schema :
- CUSTOMER (cid, cname, city, discent)
- AGENTS (aid, aname, city, percent)
- PRODUCTS (pid, pname, city, qty, price)
- ORDERS (ordno, month, cid, aid, pid, qty, rupees)
- where the underlined column names are primary keys.
- Write down the expressions in specified languages for each of the following queries :
- i) Find all customer id, agent id and product id for customer, agent and product combinations that are all in the same city (relational algebra). 3
- ii) Get the names of agents who place orders for all products ordered by customer C003 (relational algebra). 3
- iii) Get product names ordered by at least one customer based in Bangalore through an agent based in Mumbai (SQL). 3
- iv) Find customer ids of customers who have largest discount ; separately find those who have smallest discount (SQL). 3
- b) Justify the following statement :
- “SQL is relationally complete.” 3



10. a) Define outer join with an example. 3
- b) Explain the difference between base table and view table. 4
- c) Write different types of locks and their use in concurrency control with suitable example. 5
- d) What do you mean by query processing ? How can it be done ? 3
11. Write short notes on any *three* of the following : 3 × 5
- a) Data dictionary
- b) Two-phase locking protocol
- c) Deadlock recovery
- d) Functional dependency
- e) ACID properties of transaction
- f) Armstrong's Axioms.
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