SVKM's NMIMS
MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

Programme:MCA Year: I Semester:I

Academic Year: 2013-14

Subject :Database Management System

Date : 04/12/2013

Marks: 100
Time : 10.00 am to 1.00 pm
Duration :3 (hrs)

Final-Examination

N.B.: (1) Question No.1 is Compulsory.
(2) Out of remaining six questions attempt any Four questions.
(3) In all five questions to be attempted.
(4) All questions carry equal marks.
(5) Answer to each new question to be started on fresh page.

Sr.No	Questions	Marks
1a	Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows: • The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code. • Each customer of the company is identified by a unique customer number,first and last name, and Zip Code.Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock. • Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected ship date. The actual ship date is also recorded. **i) Draw ER diagram according to the above requirements.** **ii) Convert the ER diagram into equivalent schema**	10
1b	**Explain the following terms with example** (i) Mapping Cardinality (ii) Rename operator in relational algebra (iii) Super Key (iv) Full outer join (v) TCL	10

2a *supplier* (*supplier-name, street, city*)
parts (*parts-name, color ,description*)
sp (*supplier-name, parts-name, quantity*) **10**

i) Create relations supplier and sp
ii) Add a new supplier to the database; assume any values for required attributes.
iii) update the quantity for the supplier "Sachin Parkar" and part as printers
iv) Find all parts supplied by Mumbai supplier
v) Find the average quantity of parts.

2b Explain the disadvantages of File Processing system and the advantages of DBMS. **10**

3a *employee* (*person-name, street, city*)
works (*person-name, company-name, salary*)
company (*company-name, city*)
manages (*person-name, manager-name*) **10**

Solve the following Queries using relational algebra:

i. Modify the database so that "Sachin" now lives in "Agra"
ii. Find the names, street address, and cities of residence of all employees who
work for ICICI and earn more than Rs10,000 per month
iii. Find the company with the smallest payroll

Solve the following Queries using domain Calculus

iv. Find the names of all employees in this database who do not work for ICICI Bank
v. Find the company name which is in Mumbai

3b Explain View Serializability with example **10**

4a i. List all functional dependencies satisfied by the relation **5**

A	B	C
a_1	b_1	c_1
a_1	b_1	c_2
a_2	b_1	c_1
a_2	b_1	c_3

ii. Explain the difference between Third Normal Form and BCNF 5

4b Explain organization of records in files in the sequential file organization. Why overflow block used even if there is at a given point only one overflow record 10

5 a Explain validation based concurrency control protocol 10

5b Consider the following two transactions: 10

$T31$: read(A);
read(B);
if $A \neq 0$ **then** $B := B + 1$;
write(B).
$T32$: read(B);
read(A);
if $B = 0$ **then** $A := A + 1$;
write(A).

Add lock and unlock instructions to transactions $T31$ and $T32$, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?

6a Explain Differed modification technique for log based recovery 10

6b Explain what is deadlock and methods for deadlock recovery 10

7 **Write short notes for: (Any four)** 20

i. Attributes and its types
ii. Aggregate functions in SQL
iii. Shadow Paging
iv. Checkpoints
v. Triggers in SQL