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

Programme: MCA Year: I Semester: I

Academic Year: 2017-2018

Subject: Database Management Systems

Date: 4 December 2017

Marks: 70
Time: 10.00 am to 1.00 pm
Durations: 3 (Hrs)
No. of Pages: 03

Final-Examination

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any __4___ questions.
3) **In all ___5_ questions to be attempted.**
4) All questions carry equal marks.
5) **Answer to each new question to be started on a fresh page.**
6) **Figures in brackets on the right hand side indicate full marks.**
7) **Assume suitable data if necessary.**

Q No			Marks
Q1			
	a)	Explain 4 advantages of DBMS over file system.	04
	b)	Explain referential integrity with example.	02
	c)	What is SET compatibility?	02
	d)	List all functional dependencies satisfied by the relation.	06

X	Y	Z
X1	Y1	Z1
X1	Y2	Z1
X2	Y2	Z1
X2	Y2	Z1

Q2	a)	Design an **E-R model** for user authentication system.	07
	b)	Explain the mapping, degree and participation constraints in relational database schema with suitable example.	07
Q3	a)	For the following given database, write SQL queries person (driver_id, name, address) car (license, model, year) accident (report_no, date, location) owns(driver_id, license)	08

participated (driver_id, license, report_number, damage_amount)

i) Find the total number of people who owned cars that were involved in accident in 2014.

ii) Add a new accident to the database; assume any values for required attributes

iii) Delete the Mazda belonging to"John Smith".

iv) Find all accidents with damage amount above 50000.

b) Explain the following relational algebra operations in detail 06

i) Select ii) Project iii) Cartesian Product

Q4 a) Define serializability. Explain conflict serializability. 06

b) Consider the following relations. 08

Dealer (Dealer-no, DealerName, address)

Part (Part-no, Part-name, color)

Assigned-to (Dealer-no, Part-no, cost)

Use **Relational Algebra** to answer the following:

(i) Find the name of all dealers who supply 'Red' Parts

(ii) Find the name of the dealers who supply both Yellow and Green parts

(iii) Find the name of the dealers who supply all the Parts

(iv) List all dealer names

Q5 a) Consider the following relational schemas. **Normalize** the above relation schema in the highest possible normal form. 08

i) **EMP_PROJ** (Ssn, Pnumber, Hours, Ename, Pname, Plocation)

and the functional dependencies are

FD1 Ssn, Pnumber ------> Hours

FD2 Ssn ------> Ename

FD3 Pnumber ------> Pname , Plocation

ii) **EMP_DEPT** (Ename, Ssn, Bdate, Address, Dnumber, Dname, Dmgr_ssn)

and the functional dependencies are

FD1 Ssn ------> Ename, Bdate, Address, Dnumber

FD2 Dnumber ------> Dname, Dmgr_ssn

b) Explain ACID properties and draw state transition diagram. 06

Q6 a) Explain two phase locking protocol. 06

b) Consider following relations and write SQL queries for given statements. 08

STUDENT (Ssn, Name, Subject, DOB)

COURCE (Course_id, Name, Dept)

ENROLL (Ssn, Course_id, Semester, Grade)

BOOK_ISSUED (Course_id, Semester, ISBN)

TEXT (ISBN, Title, Publisher, Author)

(1) Find all student details registered for course id 10

(2) Find various book titles and authors for semester higher than 3

(3) Find all students belongs to IT Department (without join)

(4) Find total number of student s enrolled in IT Department

Q7 a) Explain dense, sparse and multivalued indexing for the database. 07

b) What is hashing? And explain all types of hashing. 07
