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

Programme: MCA Year: I Semester: I

Academic Year: 2015-2016

Subject: Database Management Systems

Date: 05/12/2015

Marks : 70
Time : 10.00 am to 1.00 pm
Durations : 3 (hrs)

Final-Examination

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

N.B.:

(1) Question No.1 is **compulsory**.
(2) Out of remaining **six** questions attempt any **four** questions.
(3) Assumptions made should be **clearly** stated.
(4) All questions carry equal marks.
(5) Answer to each new question to be started on **fresh page**.
(6) Figures on the right hand side indicate **full marks**

Q1 A) Consider a MOVIE database in which data is recorded about the movie industry. The data requirements are summarized as follows: 10

- Each movie is identified by title and year of release. Each movie has a length in minutes. Each has a production company, and each is classified under one or more genres (such as horror, action, drama, and so forth).Each movie has one or more directors and one or more actors appear in it. Each movie also has a plot outline. Finally, each movie has zero or more quotable quotes, each of which is spoken by a particular actor appearing in the movie.
- Actors are identified by name and date of birth and appear in one or more movies. Each actor has a role in the movie.
- Directors are also identified by name and date of birth and direct one or more movies. It is possible for a director to act in a movie (including one that he or she may also direct).
- Production companies are identified by name and each has an address. A production company produces one or more movies.

a) Draw ER diagram according to the above requirements.
b) Convert the ER diagram into equivalent schema

B) Explain the following terms with examples 4

(i) Weak Entity Set
(ii) Foreign Key

Q2 A) i. Suppose that we decompose the schema $R = (A, B, C, D, E)$ into 4

R1 = (A, B, C), R2 =(A, D, E)
Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds:
$A \rightarrow BC$
$CD \rightarrow E$
$B \rightarrow D$
$E \rightarrow A$

ii. Explain 3NF with example 4

B) ***Supplier(S#, sname, status, city)*** 6
Parts(P#, pname, color, weight, city)
SP(S#, P#, quantity)

Write SQL query of following:-

a) Create relations Supplier and SP.
b) Add a new supplier to the database; assume any values for required attributes.
c) Count number of supplier who supplies 'red' part.
d) Delete records in supplier table whose status is 40.
e) Find the supplier names whose name starts with 'S' and arrange it in decreasing order of *S#*
f) Find all suppliers whose status is 10, 20 or 30.

Q3 A) Explain the three tier database architecture. State the difference between two tier and three tier architectures. 5

B)
i. Explain any two string functions in SQL. 2
ii. What are transaction control commands? Explain any two commands. 2
iii. Given relation R with attributes A,B, C,D,E,F and set of FDs as A-> BC, E-> CF, B->E and CD-> EF. Find out closure A^+, B^+ of the set of attributes. 2
iv. Explain any three database users. 3

Q4 A) Explain Immediate database modification technique for log based recovery 7

B) Explain ACID properties of a transaction also explain various states of transaction. 7

Q5 A) Explain various RAID levels. 7

B) Explain Two Phase Locking protocol. 7

Q6 A) Explain following relational algebra operation

(a) selection operation 2
(b) Generalised Projection 2

(c) Left outer join 2

(d) right outer join 2

B) Explain what is deadlock and any one method for deadlock Prevention. 6

Q7 Write short notes for: (Any two) 14

i. Aggregate functions in SQL with example
ii. Shadow Paging
iii. Generalization and specialization with example.

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