

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING) END SEMESTER EXAMINATIONS, APR-2018

SUBJECT: DATABASE MANAGEMENT SYSTEMS [CSE 3281] REVISED CREDIT SYSTEM

Time: 3 Hours

28/Apr/2018

MAX. MARKS: 50

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Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.
- Draw diagrams wherever applicable.
- 1A What are the different levels of data abstraction in a Database Management System? Explain 3 with the help of a diagram.
- **1B** What is a Candidate Key? How is it different from a Super key? Give an example
- **1C** Consider the following schema:
 - Sailors(<u>sid</u>, sname, rating, age) Boats(<u>bid</u>, bname, color) Reserves(<u>sid, bid</u>, day:date)

Write the following queries in relational algebra:

- i. Find the names of sailors who have reserved boat 100.
- ii. Find the name of the boat that was reserved by sailor named 'Mark' or 'Adam' .
- iii. Find the names of sailors who have reserved a red or green boat.
- iv. Find the names of sailors who have reserved all boats
- 2A Draw a neat ER diagram for the MOVIE database in which data is recorded about movie 5 industry. The data requirements are summarized as follows:
 - 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.
 - 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.
- **2B** To create a database design, which is better: Normalization or ER diagram? Justify your **2** answer.



- **3C** For the relational schema shown in the Fig.3C, write SQL queries to:
 - i. Retrieve the SSN values for all employees.
 - ii. Retrieve all employees whose address is in Houston, Texas i.e the value of the ADDRESS attribute must contain the substring 'Houston,TX'.
 - iii. Find the department that has the highest average salary
 - iv. Give all employees who work on the 'ProductX' project a 10% raise
- **4A** Consider the relation R as shown here:

	Α	В	С	
	а	b	С	
	d	b	С	
	е	С	С	
	е	С	d	
ich of th	he following funct	ional depender	ncies hold over	r relatio

 $\begin{array}{ccc} \mbox{Which of the following functional dependencies hold over relationship R?} \\ \mbox{i. } A \mbox{ } B & \mbox{ii. } B \mbox{ } A & \mbox{iii. } B \mbox{ } C & \mbox{iv. } BC \mbox{ } A \end{array}$

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4B	Describe 3 Armstrong's axioms with examples.		
4C	Given a relation R = (A,B,C,D,E) with the following functional dependencies: {CE \rightarrow D, D \rightarrow B, C \rightarrow A}. i. Find all candidate keys. ii. Decompose the relation into 3NF		
5A	Define Transaction and describe the ACID properties of a Transaction with suitable examples		
5B	 Write SQL commands to: Create an Employee table which captures the following information. First Name, Middle Initial, Last Name, SSN, Date of Birth, Address, Sex, Salary, Supervisor's SSN, Department Number. (Assume suitable domains for each column. Assume SSN to be the Primary Key). ii. Add a new Employee into the database with the following details: (Match the information available with that of your schema) Name: Suraj J Krishnan; SSN:123456789; DoB: 04-10-1995; Address: Baker Street, London; Sex: Male; SuperSSN: 123456780;, Department Number: 1. iii. Change the Department of Employee with SSN: 123456789 to Department Number: 10 iv. Remove the Employee with SSN: 123456789 from the database. 	5	

v. Remove the Employee table from the database.
