KLE Technological University

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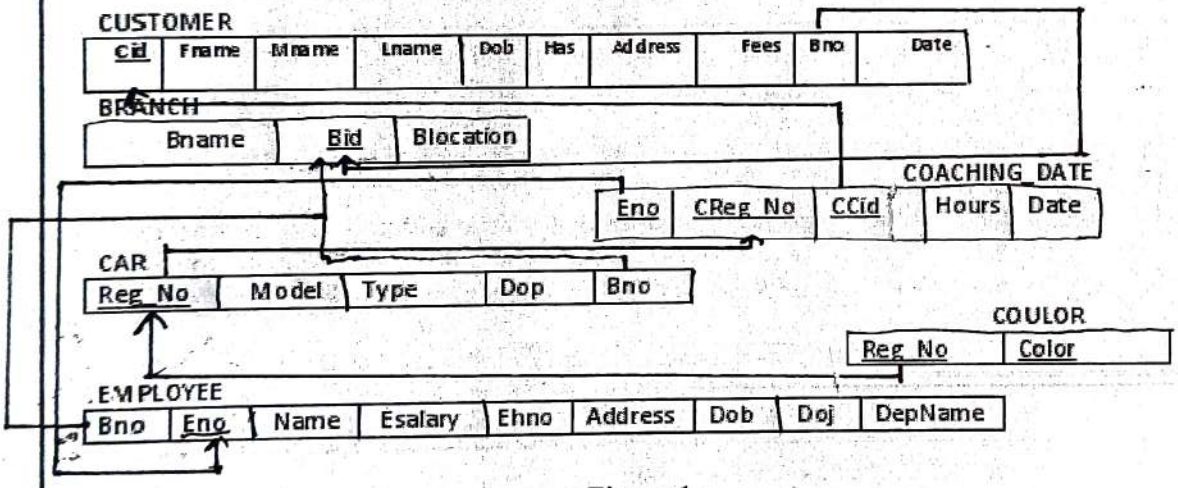
Earlier known as
B. V. B. College of Engineering & Technology

School of Computer Science and Engineering

MINOR EXAM I

Course : Database Management System	USN :
Course Code : 15ECSC208	Semester : IV
Date of Exam : 24/02/2020	Duration : 75 mins

Note: (i) Answer any two full questions. (ii) Each full question carries equal marks.

Q.No	Questions	Marks
1.a	Consider the two tables T1 and T2. Show the results of the following relational algebra operations. Table T1 P | Q | R 10 | a | 5 15 | b | 8 25 | a | 6 Table T2 A | B | C 10 | b | 6 25 | c | 3 10 | b | 5 (a) $T1 \bowtie_{T1.P=T2.A} T2$ (b) $T1 \bowtie_{T1.Q=T2.B} T2$ (c) $T1 \rhd\!\bowtie_{T1.P=T2.A} T2$ (d) $T1 \bowtie\!\lhd_{T1.Q=T2.B} T2$ (e) $T1 \cup T2$ (f) $T1 \bowtie_{T1.P=T2.A \text{ AND } T1.R=T2.C} T2$	06
1b	How are inherent model-based constraints different from application-based constraints of the relational model? Give one example for your justification..	04
1c	 Figure 1 Write the relational algebra queries for the following functional requirements of Driving School Database shown in schema diagram (Figure 1) i) List the names of all customers and names of drivers (employees) from whom he/she takes the coaching if any. ii) List the names of the customers who took more than 40 hours of coaching on Car of type "Toyota."	10

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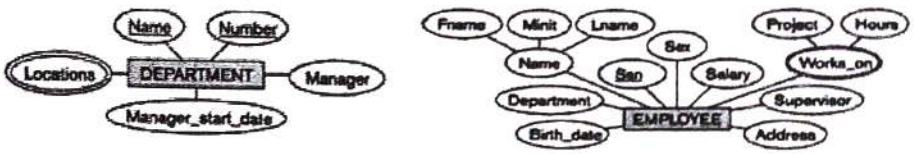
	iii)Display the names of the customers who took the coaching on all types of cars. iv)For each branch, find the total number of customers registered and the total number of cars available.	
2a	Explain how data independence is achieved in DBMS	04
2b	Write the SQL queries for all the functional requirements defined in question number 1 c	10
2c	Consider the following Entity types with the corresponding attributes shown in Figure 2 i) Do you feel some of these attributes are not appropriate? If yes, give a reason and list all such attributes. ii) If your answer is yes, how do you treat such attributes? Accordingly, modify the figure shown in Figure 2.  Figure 2	6
3a	Draw the ER Diagram and convert the same to the relational schema for the 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 shipping date is also recorded.	10
3b	Explain *IN* and *EXISTS* operators with examples.	4
3c	Find the n^{th} highest salary of the employee (figure 1 of question no 1 c) using correlated and nested queries. Which one is the optimized query? Justify your answer.	6