



Bahria University, Islamabad Campus

Department of Computer Sciences

Final-Term Examination

Class/Section: BSCS(4A+4B)

(Spring 2021 Semester)

Paper Type: Descriptive

Course:	Database Management Systems	Date: 12-07-21
Course Code:	CSC-220	Time: 1200 to 1430 Hrs
Faculty's Name:	Dr. M. Imran	Max Marks: 50
Time Allowed:	2.5 Hours	Total Pages: 2 (including this)

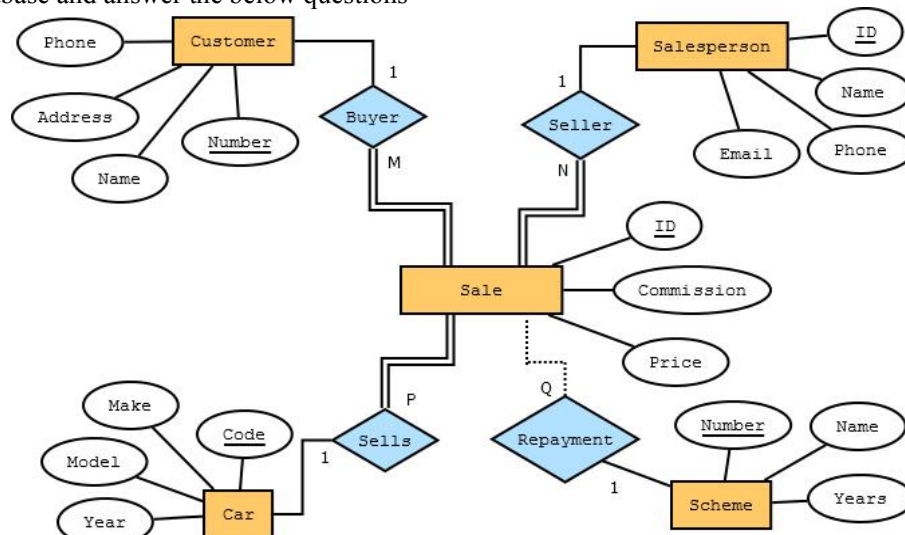
INSTRUCTIONS:

- All questions are compulsory.
- There are total four questions.
- Use blue, black or blue-black ink only. Do NOT use lead pencil especially.

Question # 1

[10]

Consider the ER diagram shown below for the part of modeling project management activities in an organization database and answer the below questions



- List the strong (non-weak) entity types in the ER diagram.
- Is there a weak entity type? If so, give its name, partial key, and identifying relationship.
- What constraints do the partial key and the identifying relationship of the weak entity type specify in this diagram?
- List the names of all relationship types, and specify the (min, max) constraint on the participation of an entity type in a relationship type. Justify your choices.
- List concisely the user requirements that led to this ER schema design.

Question # 2

[2+8]

Discuss the role and requirement of triggers in SQL. Suppose you assigned a task to design relational schema by consider the domain of product manufacturing company by considering information of clients, branches, employee, products and human resource then identify BCNF Normal Form dependencies, remove these dependencies to transform the schemas into BCNF Normal Form.

Question#3:

[7+8]

- a) Consider the following relations for a Hotel reservation application database.
Room (*room_id*, *room_availability*, *booking_date*, *Cust_id*, *booking_details*)
Customer (*Cust_id*, *CNIC*, *F_name*, *L_name*, *Address*, *Contact_number*, *MembershipNo.*)
 Assume that each Hotel of a city has different number of rooms where each room can be booked by any customer at any time subject to its availability.
 If we apply a natural join on the relations Room and Customer in this database, what does the resulting relation schema look like? Explain the result of this operation.
 Show the Functional Dependencies in this resulting relation. Is it in 2NF? Is it in 3NF? Why or why not? (State assumptions, if you make any.)
- b) Consider the Employee relation given in the following Table , write the result of each step of the following statements;

$$DEP_EMPS \leftarrow \sigma_{DNO=5 \ \& \ Salary > 30000} (EMPLOYEE)$$

$$EMPS_DETAILS \leftarrow \pi_{SSN, Fname, Lname, Salary} (DEP_EMPS)$$

$$SUPERVISOR \leftarrow \pi_{SUPERSSN} (DEP_EMPS)$$

$$RESULT \leftarrow EMPS_DETAILS \cup SUPERVISOR$$
EMPLOYEE

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

Question#4:

[10+5]

- a) Consider the relation of Employee_Branch given in the following table ;

EmployeeID	Name	Designation	Salary	Cmpny_Br_Code	Br_Address	Contact #
101	Maryam	Writer	50000	1023	I-8, ISB	12345
102	Sajjad	Cashier	25000	1320	H-10, ISB	54321
103	Ali	HR- manager	75000	1023	I-8, ISB	12456
104	Aziz	Cashier	25000	1023	I-8, ISB	65421
105	Zahra	Staff	20000	1320	H-10, ISB	14725
106	Waleed	Staff	20000	1320	H-10, ISB	52741

- Is this table susceptible to update anomalies? If yes then provide example of insertion, deletion and modification anomalies, if exists.
 - Normalize the given relation. Make sure that you write each and every step that you perform in order to normalize the given relation.
 - What are the primary and foreign keys of the resultant relations?
 - Differentiate normalization from decomposition concept using the Employee_Branch relation given in this question.
- b) Consider sample relations and answer the following questions
- Write SQL query to perform UNION set operation
 - Write SQL query to perform MINUS set operation
 - Write SQL query to create SEQUENCE in SQL
 - Write SQL query to create VIEW in SQL
 - Write SQL query to update a VIEW in SQL

The End of Question Sheet
