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|  | **Database Management Systems**  **BSCS-4**  **Department of Computer Science**  **Bahria University, Lahore Campus** |

**Assignment: [4]**

Date: Week 15, 03 January 2024

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Roll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Evaluation of CLO** | **Question Number** | **Marks** | **Obtained Marks** |
| **CLO: Analyze user requirements to design a database for the given scenarios** |  |  |  |
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|  |  |  |
|  |  |  |
| **Total Marks** | | **20** |  |

**Question 1**

A table contains sample data for parts and for vendors who supply parts. The part numbers uniquely identify parts and that vendor names uniquely identify vendors.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part\_No | Description | Vendor\_Name | Address | Unit\_Cost |
| 1234 | Logic chip | Ejaz | Peoples colony | 10.00 |
|  |  | Naeem | Medina town | 8.00 |
| 5678 | Memory chip | Ali Raza | Peoples colony | 3.00 |
|  |  | Anjum | Raza Abad | 2.00 |
|  |  | Nasir | Saeed colony | 5.00 |

1. Convert this table to a relation (named PART SUPPLIER) in first normal form. Illustrate the relation with the sample data in the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part\_No | Description | Vendor\_Name | Address | Unit\_Cost |
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| 5678 | Memory chip | Nasir | Saeed colony | 5.00 |

1. List the functional dependencies in PART SUPPLIER and identify a candidate key.

Part No Description

Vendor Name Address

Part No, Vendor Name Unit\_Cost

1. For the relation PART SUPPLIER, identify each of the following: an insert anomaly a delete anomaly and a modification anomaly.

Insert anomaly: It is not possible to insert a new vendor before including a part number.

Delete anomaly: If part information is deleted, information about a vendor who supplies that part is also lost.

Modification anomaly: If a vendor address changes, all records for that vendor has to be modified.

1. Draw a relational schema for PART SUPPLIER and show the functional dependencies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part\_No | Description | Vendor\_Name | Address | Unit\_Cost |

1. In what normal form is this relation?

1NF

**Question 2**

Examine the Patient Medication Form for Civil Hospital as follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Civil Hospital  Patient Medication Form | | | | | | | |
| Patient Number:9876  Full Name: Ali Ahmad Ward Number: W11  BedNumber: 87 Ward Name: Fatima | | | | | | | |
| Drug Number | Name | Description | Dosage | Method of Admin | Units per Day | Start Date | Finish Date |
| 10223  10334  10223 | Morphine  Tetracycline  Morphine | Pain Killer  Antibiotic  Pain Killer | 10mg/ml  0.5mg/ml  10mg/ml | Oral  IV  Oral | 50  10  10 | 24/03/01  24/03/01  25/04/02 | 25/04/02  17/04/01  02/05/03 |

1. Identify the functional dependencies represented by the data shown in the form in

Patient No Full Name

Ward No Ward Name

Drug No Name, Description, Dosage, Method of Admin

Patient No, Drug No, Start Date Units per Day, Finish date

Functional dependencies for Bed No are unclear. If Bed No is unique number tor entire hospital then Bed No Ward No. Bed No is concerned with allocation of patients on waiting list to beds.

1. Describe and illustrate the process of normalizing the data shown in Figure to first (1 NF), second (2NF), third (3NF), and BCNE

**First Normal Form**

Patient No Drug No, Start Date, Full Name, Ward No, Ward Name. ‘Bed No, Name, Description, Dosage, Method of Admin, Units per Day, Finish Date

**Second Normal Form**

Patient No, Drug No, Start Date, Ward No, Ward Name, Bed No, Units per Day, Finish Date

Drug No, Name, Description, Dosage, Method of Admin

Patient No, Full Name

**Third Normal Form/BCNF**

Patient No, Drug No, Start Date, Ward No, Bed No, Units per Day, Finish Date

Drug No, Name, Description, Dosage, Method of Admin

Patient No, Full Name

Ward No, Ward Name

1. Identify the primary, alternate, and foreign keys in your BCNF relations

Patient No(FK), Drug No(FK), Start Date, Ward No(FK), Bed No, Units per Day, Finish Date

Drug No, Name, Description, Dosage, Method of Admin

Patient No, Full Name

WARD (Ward No, Ward Name)

The primary keys underlined.