The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Electrical & Computer Engineering

080

General Instructions

1. Read all instructions carefully before answering the questions.

2. This question paper consists of **Five (5)** questions in **Four (4)** pages.

3. Answer all the 05 questions.

4. Answer for each question should commence from a new page.

5. This is a Closed Book Test **(CBT).**

6. Answers should be in clear hand writing.

7. Do not use red color pen.

Answer all questions

Question 1

Medicare hospitals located in Colombo, Galle, and Kandy have one or more physicians on their staff. A physician works in only one hospital. A physician may admit one or more patients. A patient can be admitted by only one physician. Each patient may incur any number of payments. A payment can only be incurred by one patient.

Medicare hospitals have one or more wards and each ward is located in exactly one hospital. A ward has any number of employees each of whom may work in one or more wards.

    A. Create an Entity Relationship Diagram (ERD) for the scenario stated above with appropriate cardinalities, Primary keys, and show some appropriate non-key attributes.

    Note: Cleary state any assumptions you made.   **[20 Marks]**

Question 2

Consider the following tables to express the SQL queries mentioned below.

    Customer   (CusNo, CustomerName, Address, CusPhone)

    Order   (OrderNo, OrderDate, CusNo, OrderAmount)

    Item   (ItemNo, UnitPrice)

    Warehouse (WNo, location)

    OrderItem   (OrderNo, ItemNo, Qty)

    Shipment   (OrderNo, WNo, ShipDate)

SQL queries;

    A. Write a SQL statement to list OrderNo and ShipDate for all the orders shipped from Warehouse "W2".   **[4 Marks]**

    B. List all order numbers with items and quantity of each shipped after 12th Dec 2022.   **[4 Marks]**

    C. List all the order details that were shipped from the warehouse located in Kandy.   **[6 Marks]**

    D. Write a SQL statement to display customer names and contact details of orders, which were placed on 15th Dec 2022.   **[6 Marks]**

Question 3

The following Order form shows the customer order from a furniture store.

Note: form shows set of sample data.

Order Form

Customer No : 23438   **Order No** : 1223567
Name : Manel Perera   **Order Date** : 16 Jan 2023
Address : NO 30, Nawala road,
        Nugegoda.
Postcode : 10230

Item Code	Item Description	Quantity	Unit Cost	Subtotal
AX128	Bed	2	LKR 45,000.00	90,000.00
XC381	kids Cupboard	1	LKR 15,000.00	15,000.00
TR210	Wood Table	1	LKR 95,000.00	95,000.00
			Total	LKR 200,000.00

A. Normalize the above form data, showing functional dependencies. Show how you progress from 0NF through 1NF, 2NF, to a set of 3NF relations.
Clearly shows Primary keys and foreign keys of each relation and state any assumptions you make. **[16 Marks]**

B. Briefly explain ON CASCADE UPDATE with a suitable example from the above relations. **[4 Marks]**

Question 4

A. Explain the four (4) main features of the file-based approach in data storage. **[4 Marks]**

B. Briefly explain three (3) levels in the ANSI-SPARC architecture. **[6 Marks]**

C. Discuss four (4) advantages of **hashing** used in direct file organization. **[4 Marks]**

D. Consider the following XML document, moviestore.xml and write a FLWOR expression to show Movie title in moviestore.xml. *Write the expected output of your FLWOR expression.* **[6 Marks]**

```xml
<?xml version="1.0" encoding="ISO-8859-1"?>
<Moviestore>
        <movie genre="ACTION">
                <title lang="en">The Lord of the Rings</title>
                <director> Peter Jackson </director>
                <year> 2003 </year>
                <IMDb> 8.9</IMDb>
        </movie>


        <movie genre="Sci-Fi">
                <title lang="en">The Matrix </title>
                <director> Lana Wachowski </director>
                <year> 1999</year>
                <IMDb> 8.7</IMDb>
        </movie>
</Moviestore>
```

Question 5

TicketBooking(<u>TicketNo</u>,IssueDate,CusNo,PerfNo,SeatNo,seatStatus)

Performance(<u>PerfNo</u>,Date,Theater)

Customer(<u>CusNo</u>,Name,Address,CusPhone)

Seat(<u>SeatNo</u>,Area,Theater)

    A. Create the above relational schema using SQL statements. Make sure to add all appropriate constraints. **[8 Marks]**

    B. Add a new customer and new performance to tables created in question A.
        a. *Note: use appropriate sample data to insert.* **[4 Marks]**

    C. Write a SQL statement to change the phone number of CusNo **1345** to **0775 756 464** **[4 Marks]**

    D. Delete all the performances scheduled after 15th January 2023 **[4 Marks]**

-- End of the paper --