MOCK EXAM – ANSWER (IDB 052024)

1. A term attribute refers to a _____ of a table
    a. Record
    b. Primary Key
    c. Foreign Key
    d. Field

2. In the System Development Life Cycle (SDLC), problems defined during the planning phase are examined in greater detail during the analysis phase.
    Answer: True

3. Foreign key is
    a. A field in the table that is foreign key in another table.
    b. A field in the table that is primary key in another table.
    c. A field in the table that is record key in another table.
    d. A field in the table that is column key in another table

4. _____ is one reason for problems of data integrity.
    a. Data redundancy
    b. Security constraints
    c. Data inconsistency
    d. Data availability constraints

5. A database management system
    i. Allows simultaneous access to multiple files
    ii. Can do more than a record management system
    iii. Is a collection of programs for managing data into a single file

    a. i, ii
    b. i, ii, iii
    c. i, iii
    d. ii, iii

6. ROLLBACK in a database is _____ statement.
    a. DDL
    b. DML

c. DCL

d. CML

7. Which of the following statements fully describes data in 2NF

a. When any repeating fields have been removed and the table is given primary key.

b. When all the fields in each table are directly related to the primary key.

c. When all repeating entries of data are removed and the fields in each table are directly related to the primary key and no fields are present that are not related to each other.

d. None of the mentioned.

8. Data normalisation is enforced by the DBMS through a proper use of primary and foreign key rules.
Answer: False

Model

Model ID	Last name	First name	Model type ID
104	Greene	Lauren	PM
105	Jackson	Linda	PS
106	Adams	Mckenna	CM

Model Type

Model type ID	Type description	Hourly fee
CM	Child Model	500.00
CP	Commercial Print	800.00
HF	High Fashion	800.00
PM	Petite Model	700.00
PS	Plus-size Model	700.00

Client

Client ID	Client name	Client phone	Client email
2000	Zulily	(551) 881-8789	ed@zulily.com
2225	Free People	(817) 339-4323	jchang@fp.com
2350	JCPenney	(800) 887-2324	fred@jcp.com

Booking

Booking ID	Date	Client ID
1	5/10/15	2000
2	5/11/15	2000
3	5/13/15	2350

9. Which characteristic points to the tables shown above being in third normal form (3NF)

a. The tables are completely free of data redundancy

b. The attributes are all single valued

c. "ClientID" appears in more than one table.

d. Each primary key has a functional dependency on every other primary key in the table

10. The primary objective in database design is to create complete, normalized, nonredundant and fully integrated conceptual, logical, and physical database models.
Answer: <mark>True</mark>

11. What is atomic field
    a. A field that contains multiple items of data
    b. <mark>A field that contains only one item of data</mark>
    c. A field that is repeated
    d. A field that contains is not repeated

12. Based on the description below, how many tables will be created?

    - An employee can handle many projects, and each project is handled by many employees.
    - A department can has many employees and each employee belongs to one department.

    a. 3 tables
    b. <mark>4 tables</mark>
    c. 5 tables
    d. 4 tables

13. Candidate key is a set of attributes that uniquely identifies tuples in table. A table can only have one candidate key.
Answer: <mark>False</mark>

14. Weak entity type:
    a. An entity that is not existence-dependent on some other entity type.
    b. An entity that characterizes a DBMS.
    c. <mark>An instance that is existence-dependent on some other entity type.</mark>
    d. None of mentioned.

15.

Table: **salesman**

```
salesman_id |    name     |   city    | commission
------------+-------------+-----------+-----------
       5001 | James Hoog  | New York  |      0.15
       5002 | Nail Knite  | Paris     |      0.13
       5005 | Pit Alex    | London    |      0.11
       5006 | Mc Lyon     | Paris     |      0.14
       5007 | Paul Adam   | Rome      |      0.13
       5003 | Lauson Hen  | San Jose  |      0.12
```

Based on above table, answer the following questions:

b. Write a SQL statement that displays all the information about all salespeople. (2 marks)

SELECT * FROM salesman;

c. Write a SQL statement to display specific columns such as names and commissions for all salespeople. (3 marks)

SELECT name, commission FROM salesman;

16.

Table: **Order**

```
ord_no      purch_amt   ord_date      customer_id   salesman_id
--------    ---------   ---------     ----------    -----------
70001       150.5       2012-10-05    3005          5002
70009       270.65      2012-09-10    3001          5005
70002       65.26       2012-10-05    3002          5001
70004       110.5       2012-08-17    3009          5003
70007       948.5       2012-09-10    3005          5002
70005       2400.6      2012-07-27    3007          5001
```

Based on above table, answer the following questions:

a. From the following table, write a SQL query to identify the unique salespeople ID. Return salesman_id. (3 marks)

SELECT DISTINCT salesman_id FROM order;

b. From the following table, write a SQL query to find orders that are delivered by a salesperson with ID. 5001. Return ord_no, ord_date, purch_amt. (3 marks)

SELECT ord_no, ord_date, purch_amt FROM order WHERE salesman_id=5001;

17. Based on case study below, draw a complete Entity Relationship Diagram (ERD). You can choose either Chen or Crow Foot Notation. (15 marks)

> ❑ Consider the following set of requirements for a Bank database that is used to keep track of Customer.
> a) Each bank has a unique name.
> b) Each branch has a number, name, address (number, street, city), and set of phones.
> c) Customer includes their name, set of address (P.O. Box, city, zip code, country), set of phones, and social security number.
> d) Accounts have numbers, types (e.g. saving, checking) and balance. Other branches might use the same designation for accounts. So to name an account uniquely, we need to give both the branch number to which this account belongs to and the account number.
> e) Not all bank customers must own accounts and a customer may have at most 5 accounts in the bank.
> f) An account must have only one customer.
> g) A customer may have many accounts in different branches.

Answer **All relevant answers are accepted.
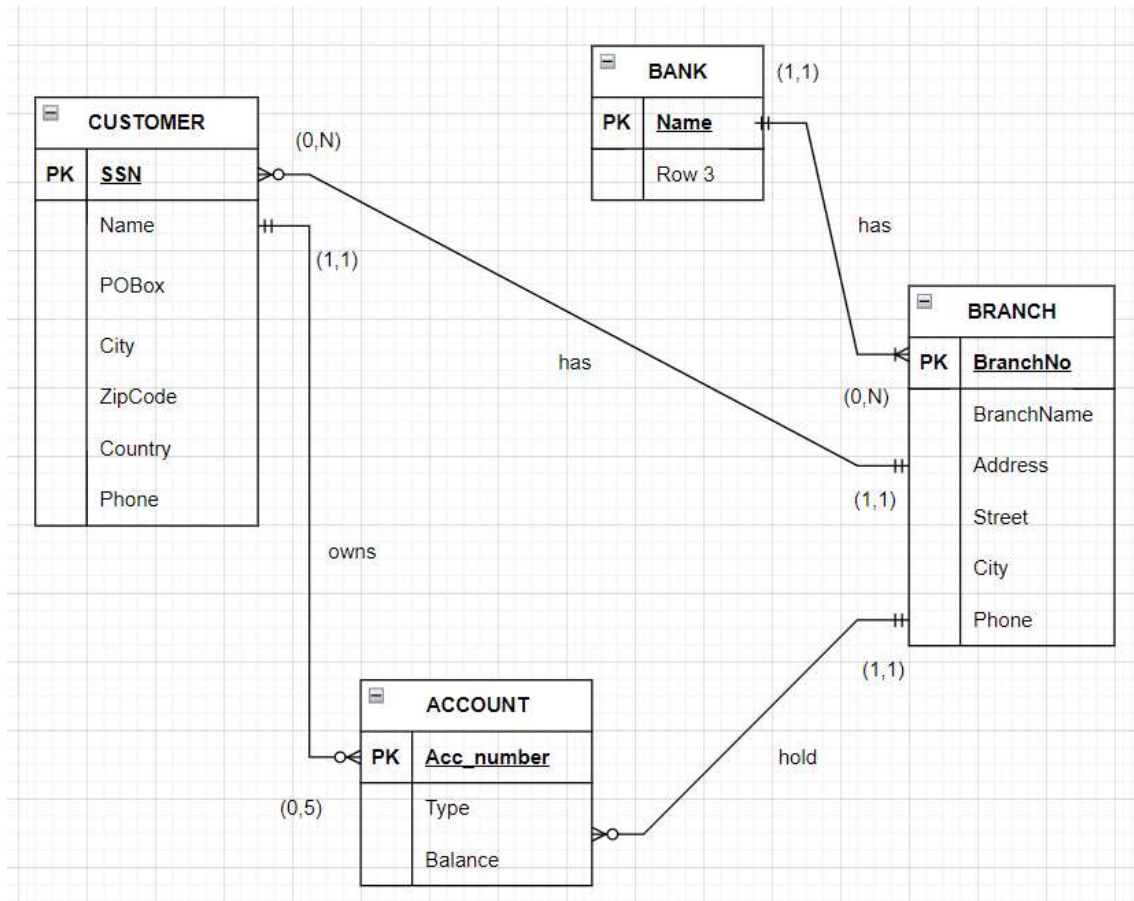
18.

Staff (Staff_ID, Name, Gender, Address, MonthlySalary, Dept_ID)

Department (Dept_ID, Name, Phone_Extension)

Based on the relations above, write structured query language (SQL) for the queries given below. (12 marks)

a. List all male staff who earn below 4000 from 'Marketing' department (3 marks)

Select S.* from Staff S
Inner join Department D on S.dept_ID=D.dept_ID
where S.monthlysalary < 4000 and S.gender='Male' and D.name='Marketing'

b. Add new department named Sales (D04), phone extension is 5014. (3 marks)

Insert into Department Values('D04','Sales',5014)

c. Staff named Ricky has changed address from Johor Bharu to Sri Petaling, make necessary changes. (3 marks)

Update Staff set Address='Sri Petaling' where name='Ricky'

d. Staff named Eugene had resigned from the company, delete his record (3 marks)

Delete Staff where name='Eugene'

19. Given the UNF below, normalized to 3NF. (20 marks)

SALES ORDER

FutureKids Kindergarten
Bukit Jalil, Kuala Lumpur
Customer ID: C005

Date: 25 Oct 2023
Sales Order No: A112

OrderNum	Description	Unit Price (RM)	Quantity (pcs)	Amount (RM)
B01	Fairy Tales Stories	45.00	3	135.00
B06	The Mermaid	28.00	1	28.00
B12	The Red Riding Hood	15.00	3	45.00

Total Amount **RM 208.00**

HandledBy:
Martin Lawrence (ClerkID 003)

StarBright Bookstore@The Exchange, Kuala Lumpur

UNF

OrderNum	Description	Unit Price (RM)	Quantity (pcs)	Amount (RM)	TotalAmount	Cust_ID	CustName	Address	SO	Date	ClerkID	ClerkName
B01	Fairy Tales Stories	45	3	135	208	C005	FutureKids Kindergarten	Bukit Jalil, Kuala Lumpur	A112	25/10/2023	003	Martin Lawrence
B06	The Mermaid	28	1	28	208	C006	FutureKids Kindergarten	Bukit Jalil, Kuala Lumpur	A113	26/10/2023	003	Martin Lawrence
B12	The Red Riding Hood	15	3	45	208	C007	FutureKids Kindergarten	Bukit Jalil, Kuala Lumpur	A114	27/10/2023	003	Martin Lawrence

1NF

Primary Key: SO + OrderNum

Full Dependencies:
SO,ORderNumber -> Quantity, Amount

Partial Dependencies:
SO -> TotalAmount,Cust_ID,CustName,Address,Date,ClerkID,ClerkName
OrderNumber -> Description, unitPrice

Transitive Dependencies:
Cust_ID -> CustName, Address
ClerkID -> ClerkName

2NF

SALES_ORDER_ITEM (<u>SO</u>,<u>ORderNumber</u> -> Quantity, Amount)

SALES_ORDER (<u>SO</u> -> TotalAmount,Cust_ID,CustName,Address,Date,ClerkID,ClerkName)

ITEM (<u>OrderNumber</u> -> Description, unitPrice)

Transitive Dependencies:
Cust_ID -> CustName, Address
ClerkID -> ClerkName

3NF
SALES_ORDER_ITEM (<u>SO</u>,<u>ORderNumber</u> -> Quantity, Amount)

SALES_ORDER (<u>SO</u> -> TotalAmount,Cust_ID,Date,ClerkID)

ITEM (<u>OrderNumber</u> -> Description, unitPrice)

CUSTOMER(<u>Cust_ID</u> -> CustName, Address)

CLERK (<u>ClerkID</u> -> ClerkName)

20. A General Hospital consists of a number of specialized wards (such as Radiology, Oncology, etc) .Information about ward includes unique name, total numbers of current patients. Each ward hosts a number of patients, who were admitted by a consultant (doctors) employed by the Hospital. On admission, the date and time are kept. The personal details of every patient includes name, Medical Recode Number (MRN), set of phone and one address (city, street, code).

A separate register is to be held to store the information of the tests undertaken. Each test has unique episode No. , category and the final result of test. Number of tests may be conducted for each patient. Doctors are specialists in a specific ward and may be leading consultants for a number of patients. Each patient is assigned to one leading consultant but may be examined by other doctors, if required.

Draw an Entity Relationship Diagram (ERD) to represent the data requirements as following:

   a. Identify the main entity types.
   b. Identify the main relationship types between the entity types.
   c. Identify attributes and associate them with entity or relationship types.
   d. Determine candidate and primary key attributes for each (strong) entity type.
   e. Determine the multiplicity constraints for each relationship .State any assumptions necessary to support your design.

You may choose to use Chen Notation or Crow Foot Notation   (20 marks)

<mark>Answer</mark> **All relevant answers are accepted.*

WARD

PK	WardName
	Total_Patient
	Location

ADMISSION

PK	AdmissionID
	Date
	Time
FK	WardName
FK	MRN

DOCTOR

PK	DocNo
	DocName

PATIENT

PK	MRN
	P_Name
	P_Phone
	P_Address
	P_Street
	P_City

TEST

PK	EpisodeNum
	Category
	FinalResult
FK	MRN

has
(1,1)
(0,1)
(0,N)
(0,N)
specialize
(0,1)
(0,1)
admit
(1,1)
(1,1)
(1,1)
exam
consults
(0,N)
(0,N)
(0,N)
undergo
(1,1)