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FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF SOFTWARE ENGINEERING

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE, BACHELOR OF INFORMATICS, BACHELOR OF CYBER SECURITY, BACHELOR OF GEOINFORMATICS, BACHELOR OF LAND ADMINISTRATION		
QUALIFICATION CODE: 07BCMS, 07BAIT, 07BCCS, 07BGEI, 07BLAM, 06DPRS		**LEVEL:** 5
COURSE: DATABASE FUNDAMENTALS		**COURSE CODE:** DBF510S
DATE: JUNE 2023		**PAPER:** THEORY
DURATION: 2 HOURS		**MARKS:** 70

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER:	**MRS SHILUMBE CHIVUNO-KURIA**
MODERATOR:	**MR GEREON KOCH KAPUIRE**

THIS QUESTION PAPER CONSISTS OF 5 PAGES
(Including this front page)

INSTRUCTIONS TO STUDENTS
1. Attempt all Questions.
2. All questions have to be answered in the <u>Answer Booklet</u>. <u>Clearly indicate the section and question number for each answer.</u>
3. The allocation of marks is an indication of the extent of the expected answer. Answering more than expected does not result in higher marks. Keywords alone are not enough.
4. There are no books, notes or any other additional aids allowed in the examination.

SECTION A: [Marks: 20]

Question 1:

Multiple Choice Questions [10 Marks]

- Answer all the questions in the answer booklet that has been provided.
- Select the best answer.

1. Transforming the data specifications into basic, or atomic elements following well-established rules is called:
   a) Implementation.
   b) Normalization.
   c) Design.
   d) typing and cross-matching.

2. The three-schema approach includes which of the following schemas?
   a) Internal.
   b) Logical.
   c) Cross-functional.
   d) Dissecting.

3. A logical description of some portion of the enterprise database is called a(n):
   a) Physical schema.
   b) User view.
   c) External schema.
   d) Conceptual schema.

4. The detailed, technology independent specification of the overall structure of the database is called the:
   a) Physical schema.
   b) User view.
   c) External schema.
   d) Conceptual schema.

5. Which of the following is NOT a characteristic of a good business rule?
   a) Declarative.
   b) Atomic.
   c) Inconsistent.
   d) Expressible.

6. The logical representation of an organization's data is called a(n):
   a) Database model.
   b) Entity-relationship model.
   c) Relationship systems design.
   d) Database entity diagram.

7. The following figure shows an example of:

EMPLOYEE	Carries	DEPENDENT
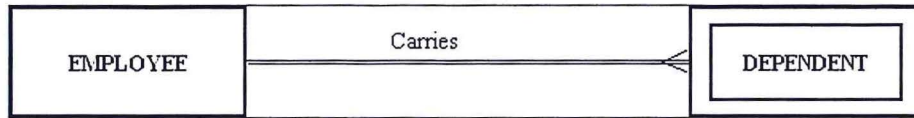
   a) A many-to-many relationship.
   b) A strong entity and its associated weak entity.
   c) A co-dependent relationship.
   d) A double-walled relationship.

8. An attribute that can be calculated from related attribute values is called a(n) _____ attribute.
   a) Simple
   b) Composite
   c) Multivalued
   d) Derived

9. A simultaneous relationship among the instances of three entity types is called a(n) _____ relationship.
   a) Ternary
   b) Tertiary
   c) Primary
   d) Unary

10. _____ is a component of the relational data model included to specify business rules to maintain the integrity of data when they are manipulated.
   a) Business rule constraint
   b) Data integrity
   c) Business integrity
   d) Data structure

Question 2   [10 marks]

Indicate whether the following statements are **True** or **False** in your answer booklet.

ID	Statement/Description	True	False
1	Personal databases involve at least five computers.		
2	A relationship where the minimum cardinality is one and maximum cardinality is one is a mandatory one relationship.		
3	The result of Null + 5400 is 5400.		
4	A composite attribute is made up of more than one attribute.		

5	In a ternary relationship, 2 entities are normally involved while a unary relationship involve just 3 entities.		
6	The NATURAL JOIN clause is based on columns in the two tables that have the same name and datatype.		
7	SQL keywords are case sensitive.		
8	Relational databases are designed to address many of the information complexity issues.		
9	The DROP TABLE statement removes the data in a table but leaves the table structure intact.		
10	Homogenous distributed databases have the same DBMS software at multiple sites.		

SECTION B: CONCEPTS   [Marks: 10]

1. Explain the following terms with an example.
a) Degree of a relationship   [2 Marks]

b) Database Management system   [2 Marks]

c) Conceptual data model (Schema)   [2 Marks]

2. Describe the difference between the TRUNCATE and DELETE command.
                                                               [2 Marks]

3. Give the difference between an Inner Join and an Outer Join.
                                                               [2 Marks]

SECTION C: COMPREHENSION   [Marks: 40]

1.   Given the following scenario create an appropriate ER diagram. Include at least 3 attributes and 1 primary Key for each entity. Include the cardinalities and relationships. Use Crow's Foot Notation.   [15 Marks]

A car insurance company wants to store customer information. Some of the information that the company wants to keep track of is the customers' name, driver's license, and residential address. They also want to store the car license, model, and year. If an accident occurs, the company needs the accident report number, accident_location, and accident_date. Each customer can own one or more cars. Each car can be associated with zero or more accidents. An accident can involve one or more customers.

2.   Write an SQL query to create a table called STAFF using the information provided in the table below. Choose relevant datatypes and include a primary key.   [10 Marks]

Staff_id	Last_name	First_name	Res_address	City	Phone	Join_date
101	Tembo	James	123 Thomson street	Windhoek	081123456	12-APR-00
111	Shivute	Solomon	456 Stephen street	Rundu	085271878	23-OCT-06
121	Gareses	Tina	789 Brand Street	Otjiwarongo	087380988	03-AUG-10
131	Davids	Sarah	147 Auas Drive	Walvis Bay	087917397	14-JAN-12
141	Tumoni	Tumoni	258 Bach street	Rehoboth	083889466	25-JUN-09

3.   Write a query to insert all the 5 rows into the table Staff as shown in Q. 1. [5 Marks]

4.   Tina has changed her residential address to '201 Simba Avenue' and the City to 'Tsumeb'. Write a query that will modify the Staff table accordingly.   [4 Marks]

5.   Write a query to check that the changes to Tina's details have been made. [2 Marks]

6.   Write a query to remove all the rows for the Staff from the cities that start with 'R'
[4 Marks]

************************ End of Exam********************************