UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BCS1423
COURSE	: DATABASE SYSTEMS (SET A)
SEMESTER/SESSION	: 2 - 2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 5 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Differentiate between data and information. (2 marks)

b) Explain **THREE (3)** limitations of File-Based System. (6 marks)

c) Give **FOUR (4)** examples of Database Management System (DBMS) software. (4 marks)

QUESTION 2

a) Differentiate between relational and NoSQL database model. (4 marks)

b) Relational data model consists of **FOUR (4)** basic building blocks; entity, attributes, relationship and constraints. Explain briefly each building block. (8 marks)

c) Write a business rules for the following scenarios:

i. Student and book in the library system. (2 marks)

ii. Student and course in the academic system. (2 marks)

iii. User and order in the e-commerce system. (2 marks)

d) The following ERD in Figure 1 consists of many-to-many relationship. Draw new ERD to solve the issue.

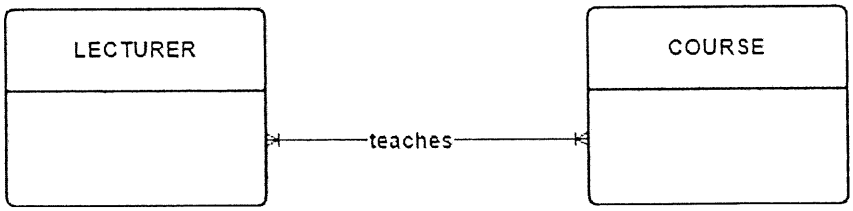

Figure 1: Many to many Relationship (4 marks)

QUESTION 3

a) List **TWO (2)** types of facts finding techniques. (2 marks)

b) Differentiate between strong and weak relationship. (4 marks)

c) The following data in Table 1 has multivalued attributes in Skills column. Draw **TWO (2)** ERD solutions for solving the problem.

Table 1: Staff Skills

ID	Name	Skills
1001	Humaira binti Syahian	JAVA Programming, Web Development
1002	Mahathir bin Mohamad	Web Development, Python Programming
1003	Najib bin Abdul Razak	JAVA Programming, PHP Programming
1004	Khadijah binti Rashid	JAVA Programming, Python, PHP
1005	Rafizi bin Ramli	Web, Python Programming

(5 marks)

d) Table 2 shows the property rental data in First Normal Form (1NF). Illustrate the process of normalizing the data shown in Table 2 as per below requirements:

Table 2: Property Rental Data

clientNo	propertyNo	cName	pAddress	rentStart	rentFinish	rent	ownerNo	oName
CR76	PG4	Humaira	PT1232, Dungun	1/7/2022	31/8/2023	350	C040	Umar
CR76	PG16	Humaira	PT1456, Kuantan	1/9/2023	31/11/2023	450	C093	Maryam
CR76	PG4	Humaira	PT1232, Dungun	1/1/2024	30/6/2024	350	C040	Umar
CR56	PG4	Irfan	PT1232, Dungun	1/11/2021	10/6/2022	350	C040	Umar
CR56	PG36	Irfan	PT1191, Kemaman	1/7/2022	1/12/2023	375	C093	Maryam
CR56	PG16	Irfan	PT1456, Kuantan	1/1/2024	30/6/2024	450	C093	Maryam
CR42	PG4	Khadijah	PT1232, Dungun	1/8/2020	31/7/2021	350	C040	Umar
CR42	PG23	Khadijah	PT1711, Kemaman	1/9/2023	31/03/2024	500	C026	Khalid

i. Complete dependency diagram. (3 marks)

ii. List of partial and transitive dependency. (3 marks)

iii. Second Normal Form (2NF). (2 marks)

iv. Third Normal Form (3NF). (3 marks)

QUESTION 4

a) Structure Query Language (SQL) consists of **TWO (2)** types. Explain each. (4 marks)

b) Describe the function for the following SQL command:

i. SELECT (2 marks)

ii. LIKE (2 marks)

iii. CREATE TABLE (2 marks)

iv. DROP TABLE (2 marks)

v. ORDER BY (2 marks)

c) Write the SQL statements for the given questions based on the following tables in Figure 2:

Table: Products

ProductID	ProductName	Price	TypeID	SupplierID
T1001	Tudung Humaira	25.00	02	S004
T1002	Skarf Hijana	15.00	04	S001
T1003	Tudung Mirnaz	30.00	02	S002
T1004	Tudung Aisyah	59.00	01	S004

Table: Supplier

SupplierID	Supplier
S001	Al Jannah Trading
S002	A&H Supply Sdn. Bhd.
S003	Seri Murni Supply
S004	Cenderawasih Trading

Table: Type

TypeID	TypeDescription
01	Shawl
02	Bawal
03	Instant
04	Inner Scarf

Figure 2: Tables

i. Display all the records in the table Products, order by the SupplierID. (2 marks)

ii. Display product name, price, supplier name and type description. (4 marks)

iii. Delete record in Products table that belong to TypeID '01'. (2 marks)

QUESTION 5

a) Define transaction in database. (2 marks)

b) Explain **FIVE (5)** transaction properties. (10 marks)

c) Assume that to produce a pen, it composed of **FOUR (4)** different parts; we called it as part A, part B, part C and part D. Each time new pen is created, it must be added into the product inventory using the Quantity attributes in PRODUCT table. In the same time the pen is created, the parts of inventory in the table COMPONENT also must be reduced by **ONE (1)** for parts A and B, **TWO (2)** for part C and **THREE (3)** for part D using the attribute PartQTY. The sample of table structure as shown in Figure 3.

Table Name: PRODUCT

Product	Quantity
Pen	502

Table Name: COMPONENT

PartID	PartQTY
A	514
B	567
C	1024
D	2066

Figure 3: Production Database

Using SQL statement, write the update request for database when new pen was created. (10 marks)

----------**End of question**----------