

PAN AFRICA CHRISTIAN UNIVERSITY

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: DICT0133

COURSE TITLE: DATABASE MANAGEMENT

CAMPUS: ROYSAMBU

EXAM DATE: MONDAY, XXXX, DECEMBER, 2024

TIME: 2:00PM - 5:00PM

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B**.
- Write only your **student number** on the answer booklet provided.

SECTION A

(Answer ALL questions in this section)

Question 1:

a) "In the second normal form, all non-key attributes are fully functional dependent on the primary key." With an aid of an example, explain the meaning of these statement.

[2 Marks]

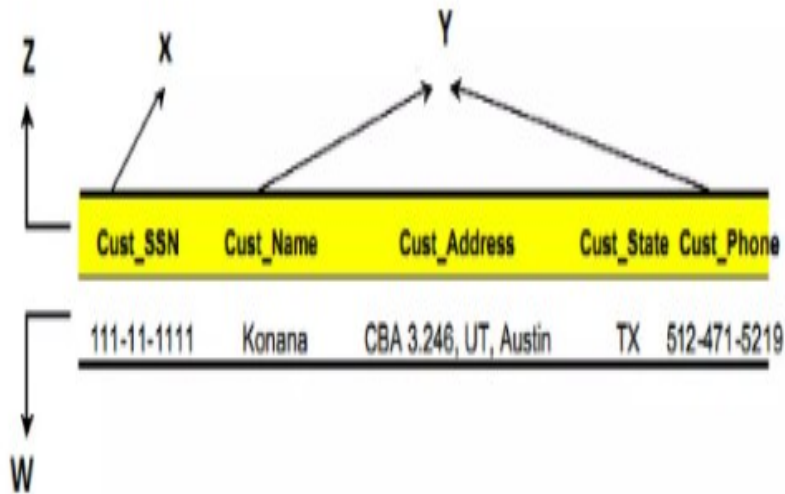
b) XYZ is a commercial bank whose daily activities involve cash deposits, withdrawals by their customers as well as accounts updates by the bank employees. The bank tellers access customers' accounts with the help of a banking Information System installed in their work stations. These transactions are stored in the bank databases created and maintained within the bank's server room. Identify two database users involved above and state their roles.

[4 Marks]

c) Write SQL statement to create a database named school.

[2 Marks]

d) Study the figure model below and use it to answer the questions that follow.



- i. Name the parts labelled W and Y. [1 Mark]
- ii. Identify the candidate key. [1 Mark]

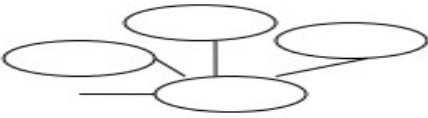
SECTION B

(Answer any THREE (3) questions in this section)

Question 2:

- a) The table below shows the Entity Relationship model symbols. Name each of them.

[3 Marks]

Symbol	
1.	
2.	
3.	
4.	
5.	
6.	

b) Read the following and answer the questions that follows.

Players play for teams located in various wards which are small administrative units in the country. Each ward is identified by the ward name and unique ward code. Some wards have no teams. Each team is identified by a team name and unique team code. A player plays for only one team. Each player is identified by an identification number, at least one telephone contact, and a player name which consist of first name and surname. A player can be assigned to play in different positions such as a stricker, center – forward, goal keeper and winger. Each player position is identified by the position name and a unique code for each position.

Required: Represent the information using an Entity Relationship Diagram. **[7 Marks]**

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Question 3:

a) Use the tables below to answer the questions that follows.

Employees Details

Emp Number	First Name	Surname	Gender	Age	DOA	Marital Status	Department
EMP 001	Agnes	Kimathi	Female	24	12/09/97	Single	Accounts
EMP 002	William	Omondi	Male	34	24/08/89	Married	Personnel
EMP 003	Christine	Wamaitha	Female	26	09/01/93	Single	Marketing
EMP 004	Teresiah	Munene	Female	28	06/08/98	Married	Personnel
EMP 005	Wesley	Resley	Male	32	16/04/89	Married	Accounts
EMP 006	Augustine	Muita	Male	29	30/7/88	Single	Marketing
EMP 007	Anthony	Kimuri	Male	30	02/03/99	Married	Security
EMP 008	Regina	Kimberly	Female	27	07/04/96	Single	Security

i. Identify the suitable field to be used as primary key from the employees table.

[1 Mark]

ii. State the field types for the following:

[3 Marks]

A. EMP NUMBER

B. DOA

C. AGE

b) Jane a database administrator in a company has been tasked to consider migrating data from an old DBMS to a new one installed in the premises.

i. Outline four factors that she should consider while planning and executing data migration.

[4 Marks]

ii. State two reasons for preparing a plan during the database migration.

[2 Marks]

Question 4:

Table 1 is named *Student* in a database. Use it to answer the questions that follow.

Student_ID	StudentName	D.O.B	Course_ID	Gender	Fees_
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					paid
N001	Jane	23.06.98	SCI104	F	21000
N002	Andrew	22.05.96	SCI101	M	10000
N003	Jacob	18.09.98	SCI102	F	15500
N004	Agnes	16.06.99	SCI104	M	16000
N005	Janet	26.04.98	SCI102	F	30000

Table 1: student

Write an SQL statement that would perform each of the following:

- i. Create *Student table* shown above where *Student_ID* is a primary key. **[3 Marks]**
- ii. Insert all the records in the Student table. **[3 Marks]**
- iii. Display *Student_ID, Course_ID and Gender* for all records whose *StudentName* starts with letter *J*. **[2 Marks]**
- iv. Display all records whose *Fees_paid* range from 10000 to 20000. **[2 Marks]**

Question 5:

a) Premier firm is a software firm dealing with the design of databases. Describe the role of the company in each of the following design phases of a database design.

- i. Conceptual database design **[2 Marks]**
- ii. Logical database design **[2 Marks]**
- iii. Physical database design **[2 Marks]**

b) Consider the table below

Part	Warehouse	Quantity	Warehouse address
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Explain four reasons why the above table is not in second normal form. **[4 Marks]**

Question 6:

a) The following are tables named First and Second in a database.

First		Second	
ID	Name	ID	Name
1	Abdi	2	Adam
2	Adam	3	Cale

Determine the output for each of the following algebraic expression operation:

i. First $\cup$ Second **[2 Marks]**

ii. First $\cap$ Second **[2 Marks]**

b) Table 2 shows details of students. Use it to answer the questions that follow.

Student_ID	StudentName	D.O.B	Course_ID	Gender	Fees_ paid
N001	Jane	23.06.98	SCI104	F	21000
N002	Andrew	22.05.96	SCI101	M	10000
N003	Catherine	18.09.98	SCI102	F	15500
N004	Agnes	16.06.99	SCI104	M	16000
N005	Martin	26.04.98	SCI102	F	30000

Table 2: students

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Write relational algebraic expression that would:

- i. Display all records of female students who have *paid fees* more than twenty thousand. **[3 Marks]**
- ii. Rename the relation *students* to *student_Marks* and the attribute *student_ID* to *S_ID*. **[3 Marks]**

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