

/PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY AND BCIT

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: BIT106

COURSE TITLE: DATABASE SYSTEMS

CAMPUS: ROYSAMBU

EXAM DATE: XXXXX XXXXX/AUGUST, 2021

TIME: XXXXX

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) Given the table below. Answer the questions that follow.

Student Table

F. Name	Reg. No	Age	Course
Korir	235	22	Bit 2012
Mwangi	230	22	Bit 2011
Mweni	233	21	Bit 2012

i. Identify the primary key in this table.

[1 Mark]

ii. Identify the SQL data types that would apply for each of the fields.

[2 Marks]

iii. Write an SQL statement that adds a record named Kamau aged 21 registration number 234 and studies bit 2011

[3 Marks]

b) Use the table lecturer and student shown below to answer the questions

Tablenames	Fields
lecturer	<u>Lecturer_id</u> , name
student	<u>Regno</u> , name

A Lecturer can supervise at most one student for a research project and a student can be supervised by at most one lecturer.

i. Identify the entities and Cardinality.

[2

Marks]

- ii. Draw the E-R model to show the relationship.

[2

Marks]

SECTION B

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

Question 2:

a) Students' records in XYZ University are kept by various sections: Hostel, Health Centre, Academic Office, major departments, Accounts Section and Library. If each of these sections maintains its own file-based system for processing, explain four limitations of these approach.

[4 Marks]

b) Draw an entity relationship diagram to represent the following scenario.

"In the library there are several books to be borrowed by registered library users. The users can borrow up to a maximum of three books at any given time. A user can request for a book which is borrowed so that it becomes available to him once it is returned."

[6 Marks]

Question 3:

The table below shows details about student recorded in un-normalized table.

Student	Age	Subject	Department Name	Department ID
Alice	25	ICT, Programming	ICT	0049
Peter	22	ICT, Commerce	Commerce	0039
Bob	27	Programming	ICT	0049
Ann	26	Statistics	Mathematics	0051

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i. Normalize the above table to 3NF

[9 Marks]

ii. List any two types of anomalies

[1 Mark]

Question 4:
Student table

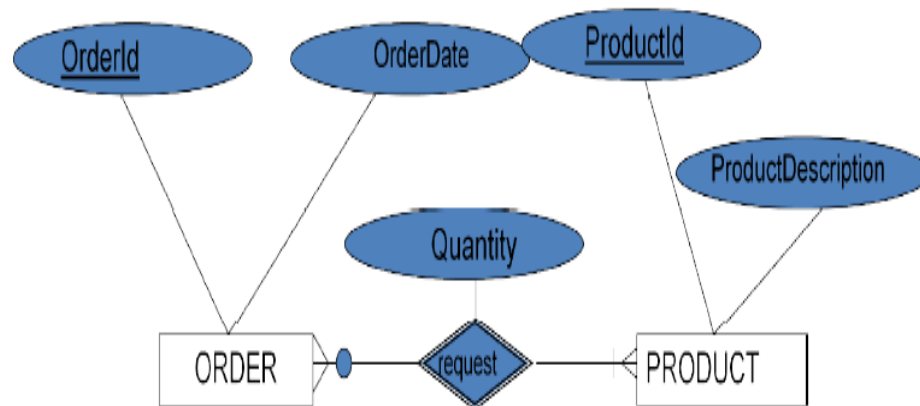
<u>RegNo</u>	Coursecode	FName	LName	Gender	TelNo
1012	BIT	Jane	Jones	F	2145788
1015	BIT	Tony	Rock	M	2145826
1245	BCOM	Jack	Kelly	M	2345785
1120	BCOM	Joyce	Mayfair	M	7562347
1009	BCOM	Agnes	Monroe	F	7548263

Write SQL statement that will:

- i. Create student table shown above where *RegNo* is a primary key. **[3 Marks]**
- ii. Insert all the records in the student table. **[3 Marks]**
- iii. Display all students taking BCOM course. **[2 Marks]**
- iv. Display *RegNo*, *Coursecode* and *Gender* for all students whose *FName* starts with letter *J*. **[2 Marks]**

Question 5:

Given the Entity Relationship model below. Use it to answer the questions that follow.



a) List the following:

i. Entities

[1 Mark]

ii. Attributes

[2 Marks]

iii. Primary keys

[1 Mark]

iv. Cardinality

[1 Mark]

b) Transform the above model into a relational model.

[5 Marks]

Question 6:

a) Explain how the following represents search patterns in SQL.

[4 Marks]

i. LIKE 'H%'

ii. LIKE '% H'

b) the main objective of the
ANSI SPARC three level

architecture is to separate
the user
views of the database from
its physical representation.
Using a diagram to
illustrate,
describe each of the
three levels in this
architecture. (9 Marks)

b) Consider the following schema:

Suppliers (sid : integer, sname : string, address : string)

Parts (pid : integer, pname : string, color : string)

Catalog (sid : integer, pid : integer, cost : real)

The key fields are underlined and domain of each field is listed after the field name

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Required:

- i. Find the name of suppliers who supply some red parts. **[3 Marks]**
- ii. Find the sides of suppliers who supply some red or green parts. **[3 Marks]**

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