

PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: BIT 106 BSIT 106

COURSE TITLE: DATABASE MANAGEMENT SYSTEMS

CAMPUS: ROYSAMBU

EXAM DATE: MONDAY, 31ST JULY, 2023

TIME: 8:00AM – 11:00AM

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.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

Question 1:

- a) i. Define the term "database model". **[1 Marks]**
ii. Outline the various database models. **[3 Marks]**
- b) Briefly explain the THREE levels of data abstraction. **[3 Marks]**
- c) State THREE roles of the database administrator. **[3 Marks]**

SECTION B

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

Question 2:

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

EMPLOYEE2					
Emp_ID	Name	Dept_Name	Salary	Course_Title	Date_Completed
100	Margaret Simpson	Marketing	48,000	SPSS	6/19/200X
100	Margaret Simpson	Marketing	48,000	Surveys	10/7/200X
140	Alan Beeton	Accounting	52,000	Tax Acc	12/8/200X
110	Chris Lucero	Info Systems	43,000	Visual Basic	1/12/200X
110	Chris Lucero	Info Systems	43,000	C++	4/22/200X
190	Lorenzo Davis	Finance	55,000		
150	Susan Martin	Marketing	42,000	SPSS	6/19/200X
150	Susan Martin	Marketing	42,000	Java	8/12/200X

- i. Identify THREE anomalies in the above table **[3 Marks]**
- ii. Normalize the above table to 3NF **[7 Marks]**

Question 3:

- a) Identify three important factors in the success of database design. **[3 Marks]**
- b) Describe the characteristics of a table that violates first normal form (1NF) and then describe how such a table is converted to 1NF. **[3 Marks]**

c) Transaction management deals with the problem of always keeping the database in a consistent state. In doing so, a transaction must always maintain four properties. Describe these properties and show how they relate to concurrency control and recovery. **[4 Marks]**

Question 4:

a) Using the table EMPLOYEE below, write SQL statements in each case to perform the tasks specified i-iii:

EmpNo	EmpName	EmpAge	EmpGender	EmpEmail	DeptNo
E001	Jacob	23	Male	ja@yahoo.com	D3
E002	Janet	24	Female	jan@gmail.com	D3
E005	Griffin	27	Male	gri@ymail.com	D1
E007	Fredrick	25	Male	fre@yahoo.com	D4
E009	Alice	25	Female	ali@ymail.com	D2

i) Display all employees whose names have letter i. **[2 Mark]**

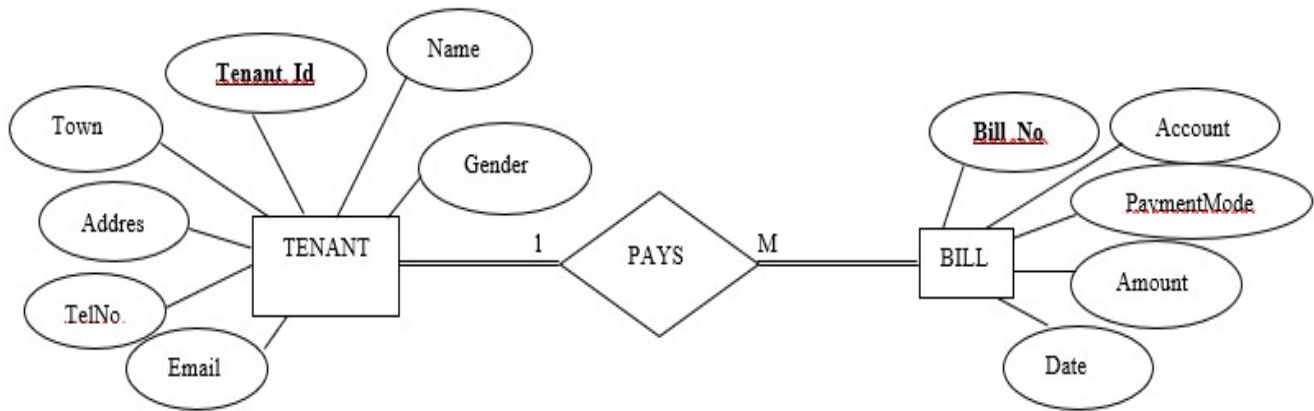
ii) Display unique age values for the employees. **[2 Mark]**

iii) Calculate the average age for the employees. **[2 Mark]**

b) Describe what is meant by full functional dependency and describe how this type of dependency relates to 2NF. Provide an example to illustrate your answer. **[4 Mark]**

Question 5:

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



a) Identify the following:

i. Entities

[2 Mark]

ii. Attributes

[2 Marks]

iii. Primary keys

[2 Mark]

b) Briefly explain how the technique of normalization can be used to check the structure of the tables created from the ER model and supporting documentation. **[4 Marks]**

Question 6:

The table below stores information relating to a concert session. Study it and answer the questions that follow:

PERFORMANCE

performanceID	performer	date	instrument
P01	Allen Wallen	01/04/2011	Violin
P02	Wade Brown	08/04/2011	Cello
P03	Patel Peters	08/04/2011	Flute
P04	Matthews Black	09/04/2011	Cello
P05	Lee Roys	10/04/2011	Oboe

a) State the result of repeating the PerformerID "P02" for the sixth record **[2 Marks]**

b) Write SQL statements to perform the following:

i) Create the above table with appropriate data types **[2 Marks]**

ii) List the names of all Cello performers **[2 Marks]**

iii) List the instrument being played by Matthews **[2 Marks]**

iv) List performances that will be made on the 8th of April **[2 Marks]**

b) he 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)

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