KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
SECOND YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF BUSINESS AND INFORMATION TECHNOLOGY
KBI 2203 DATABASES

Date: 13TH AUGUST 2024
Time: 11:30AM – 1:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTION ONE (30 MARKS)

a)   Write an SQL command to display only the EMPNO and ENAME for employees in the Employee table who are managers and have a commission above 50,000   **(4 Marks)**

b)   The table below shows data from a company database. Normalize the table to 2NF

(6 Marks)

Movie- Title	Year	Type	Director	Director_DOB	Yr_releases_cnt	Actors
Notting	1999	Romantic	Rogers M.	05/06/1956	30	Hugh G Rhys
Lagaan	2000	Drama	Ashutosh G.	15/02/1968	50	Aamir K Gracy S

c)   State two integrity constraints among most database applications   **(2 Marks)**

d)   A single cause contains several units. Students can enroll in only one course, but they pursue several units in a year, a single lecturer teaches several students and several units but only one Course. Construct an E-R diagram for the registrar's office   **(6 Marks)**

e)   Differentiate between physical view and logical view as applied in database.   **(4 Marks)**

f)   ABC Company would like to develop a relational database management system. Advice the management on the stages of developing a database system .   **(6 Marks)**

g)   Differentiate primary key and foreign key as used in databases.   **(2 Marks)**

QUESTION TWO (20 MARKS)

a)   Given the following table below:
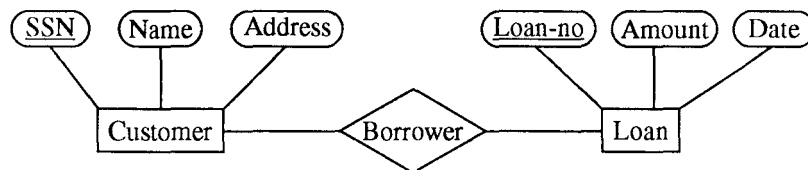
EMPNO	ENAME	JOB	DEPTNO	COMM	SALARY
101	John	Manager	1010	25,000	70,000
102	Mark	Clerk	1010	15,000	40,000
103	Eunice	Secretary	1085	17,000	45,000
104	Steve	Analyst	2047	20,000	55000
105	Carro	President	2001	30,000	90,000
106	Faith	Security	1085	5,000	10,000
107	Adrian	Clerk	950	17,000	40,000
108	Lenna	Manager	2047	25,000	70,000
109	Jack	Clerk	1070	10,000	40,000
110	Benuel	Analyst	1019	21,000	55000

Required:
i. Write an SQL command to CREATE the above Employee table with EMPNO as the Primary key (Enforce the right constraints for each attribute) **(6 Marks)**
ii. Write an SQL command to INSERT the first TWO records into Employee table **(4 Marks)**
iii. Write an SQL command to display the employees whose salary is above 50,000 **(2 Marks)**
b) Define the term Normalization as used in Database **(2 Marks)**
c) Explain SIX reasons for Normalization in a database **(6 Marks)**

QUESTION THREE (20 MARKS)
a) Suppose you have been invited to an interview for SQL developer position you had applied for, at company XYZ. The panelists desire to know your knowledge and expertise in dealing with SQL language. As per the interview panel requirements, discuss the terms given below and give two commands it provides.
   i. DDL. **(4 Marks)**
   ii. DML. **(4 Marks)**
b) Represent the given E-R model in a tabular format **(6 Marks)**

c) With the aid of illustrations, describe the Three-Level Database Architecture in database management systems **(6 Marks)**

QUESTION FOUR (20 MARKS)
a) Using relational algebra format, write down how to select the employee tuples who's:
   i. DEPT_NO is 10 **(3 Marks)**

   ii. SALARY is greater than 80,000 **(3 Marks)**

b) Kiriri university is in the process of computerizing the student data management. You have been approached as a consultant to advice on the issue. Clearly explain why distributing the data would be a better option than consolidating it at one point. **(4 Marks)**
c) In the context of databases and data storage systems, a **transaction** is any operation that is treated as a single unit of work, which either completes fully or does not complete at all, and leaves the storage system in a consistent state. Describe the ACID properties of a transaction in distributed database systems. **(8 Marks)**
d) Differentiate between TRUNCATING and DELETING a table as used in database programming **(2 Marks)**

QUESTION FIVE (20 MARKS)

a)   Use the table below to answer the questions that follow.

Project Code	Project Title	Project Manager	Project Budget	Employee No.	Employee Name	Department No.	Department Name	Hourly Rate
PC010	Pensions System	M Phillips	24500	S10001	A Smith	L004	IT	22.00
PC010	Pensions System	M Phillips	24500	S10030	L Jones	L023	Pensions	18.50
PC010	Pensions System	M Phillips	24500	S21010	P Lewis	L004	IT	21.00
PC045	Salaries System	H Martin	17400	S10010	B Jones	L004	IT	21.75
PC045	Salaries System	H Martin	17400	S10001	A Smith	L004	IT	18.00
PC045	Salaries System	H Martin	17400	S31002	T Gilbert	L028	Database	25.50
PC045	Salaries System	H Martin	17400	S13210	W Richards	L008	Salary	17.00
PC064	HR System	K Lewis	12250	S31002	T Gilbert	L028	Database	23.25
PC064	HR System	K Lewis	12250	S21010	P Lewis	L004	IT	17.50
PC064	HR System	K Lewis	12250	S10034	B James	L009	HR	16.50

    i.   Normalize the above table to 3NF and correct the redundancies on the resultant tables

(8 Marks)

b)   A bus company operates fleet of buses and would like to design the system. The following information shows entities involved in the system.
- Each passenger is booked in one bus.
- A driver can drive more than one bus.
- Buses travel to different destinations.
- The buses can be services in any garage owned by the company.

   i)   Identify entities in the bus company fleet system.　　　　　　　　　**(4 Marks)**
   ii)   Use an Entity Relation Diagram (ERD) to show the relationship among the entities.

(6 Marks)
   iii)   Identify at least 4 attributes of each entity.　　　　　　　　　**(2 Marks)**