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**KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY
DIT 1007 – DATABASE MANAGEMENT SYSTEMS**

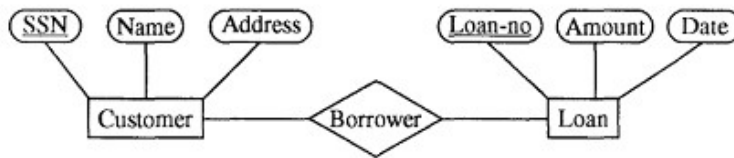
Date: 07TH AUGUST 2023
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Represent the following ER diagram in a tabular format (6 Marks)



- b) Explain the following terms as used in database systems: -
- i) Data integrity (2 Marks)
 - ii) Candidate key (2 Marks)
 - iii) Relationship (2 Marks)
- c) Distinguish between a schema and an instance as used in databases (4 Marks)
- d) With the use of relational Algebra, List each employee's identification number (EMPID), Name, (EMP_NAME) and salary (SALARY). (4 Marks)
- e) The following relations keep track of airline flight information:
- Flights (fno: integer, from: string, to : string, distance: integer, departs : time, arrives : time, price : real)
 - Aircraft (aid: integer, aname : string, cruisingrange : integer)
 - Certified (eid : integer, aid: integer)
 - Employees (eid : integer, ename : string, salary: integer)
- Write SQL statements to Find the names of pilots certified for some Being aircraft. (4 Marks)
- f) The following table is in First Normal Form, Normalize to 3NF (6 Marks)

Cours e	Prof	Ro om	Room-Cap	Enrol-Unit
353	Ken	A532	45	40
351	Ken	C320	100	60
355	Mary	H940	50	45
456	Mary	B278	50	45
459	Peter	D110	300	200

QUESTION TWO 20 MARKS

- a) James, a DBA working for a software development company was required to design a database management system. Explain five benefits the proposed database system will deliver to the company (10 Marks)
- b) An E-R diagram can express the overall logical structure of a database graphically. Discuss the elements that consist E-R model. (6 Marks)
- g) With examples, describe the two main classifications of database. (4 Marks)

QUESTION THREE 20 MARKS

- a) Construct an E-R model for a car insurance company whose customer own one or more cars each. Each car has associated with it zero to any number of recorded accidents. (6 Marks)
- b) Explain the main components of a DBMS. (8 Marks)
- c) Susan is in the process of designing a database. Explain three phases that she should consider during design (6 Marks)

QUESTION FOUR 20 MARKS

- a) Explain the Three-Level Database Architecture. (9 Marks)
- b) Define the term “database normalization” (2 Marks)
- c) With the aid of appropriate illustrations, describe any three database models (9 Marks)

QUESTION FIVE 20 MARKS

- a) Distinguish between a data administrator and database administrator as used in databases(4 Marks)
- b) Demonstrate with a diagram vividly the different stages of DDLC(Database Development Life Cycle). (12 Marks)
- c) Create a table student such that the primary key constraint on the column Roll-No is described as a table level constraint. (4 Marks)