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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATIONS, 2020/2021 ACADEMIC YEAR**  
**SECOND YEAR, SECOND SEMESTER EXAMINATION**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**(COMPUTER SCIENCE)**

**KCS 207 - INTRODUCTION TO DATABASE SYSTEMS**

Date: 16<sup>th</sup> December, 2020  
Time: 8.30am – 10.30am

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) Define the following terms as used in databases;
- i) Field
  - ii) Database,
  - iii) Data model,
  - iv) Conceptual schema
  - v) Entity (5 Marks)
- b) Distinguish between the following database concepts.
- i) Internal schema and external schema (2 Marks)
  - ii) DML and DDL (2 Marks)
  - iii) Database schema and database state (2 Marks)
  - iv) Composite attribute and multi-valued attribute (2 Marks)
  - v) Entity type and an entity set (2 Marks)
- c) Describe the backup and replication ability of database management systems (5 Marks)
- d) i) Discuss Five characteristics of the database approach (5 Marks)
- ii) Explain how the database approach differs from traditional file systems. (5 Marks)

**QUESTION TWO (20 MARKS)**

- a) Explain five models used in database design (10 Marks)
- b) Describe the phases involved in the development process of a database (10 Marks)

**QUESTION THREE (20 MARKS)**

- a) Describe the criteria for second normal form (2NF) in database design (5 Marks)
- b) Explain six roles performed by a database administrator (6 Marks)
- c) Describe three types of database administration (9 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Describe five features of Relational Database Management Systems (5 Marks)
- b) Analyze five benefits associated with the use of data warehouse in an organization (5 Marks)
- c) Explain five capabilities that should be provided by a DBMS (10 Marks)

**QUESTION FIVE (20MKS)**

- a) Explain three reasons why security of data in a database is becoming an increasing concern. (6 Marks)
- b) Most DBMS products use a data dictionary (also called the system catalogue) to hold meta-data. Give five examples of the type of data held in the data dictionary and explain five purposes of the catalogue. (10 Marks)
- c) Explain six properties of a database system that facilitate its effectiveness in decision making. (6 Marks)