



**MURANG'A UNIVERSITY OF TECHNOLOGY**  
**SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY**

UNIT CODE: IT/OS/ICT/ CR/7/6

UNIT TITLE: MANAGE DATABASE SYSTEMS

DURATION: 2 HOURS

**INSTRUCTIONS TO CANDIDATES:**

1. ANSWER ALL QUESTIONS IN SECTION ONE AND ANY TWO IN SECTION TWO
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

### QUESTION ONE (30MARKS)

- a) Distinguish between authentication and authorization (4 marks)
- b) Describe the following types of database integrity: (6 marks)
  - i. Entity integrity
  - ii. Referential integrity
  - iii. Domain integrity
- c) Distinguish between database and database management system (4 marks)
- d) Describe characteristics of a stand-alone computer (6 marks)
- e) Distinguish between distributed Database and replication server (4 marks)
- f) Explain the role of the following personnel in a database system environment (6 marks)
  - i. Database administrators
  - ii. Database designers
  - iii. Naïve or parametric end – users

### QUESTION TWO (20 marks)

Code introduced the concept of normalization and what is now known as I NE in 1970. He went on to define 2NF and 3NF in 1971.

- i. Define normalization as used in database (2 marks)
- ii. Explain four benefits an organization would gain by normalizing its database. (8 marks)

The table below is in de-normalized form

STUDENT NAME	D.O.B	COURSE TITLE	GRADE
Radull Collins	02.4.1990	Maths , Chemistry	A,C
Murvin Akon	3.3.2000	Economics	A
Rashid Kayler	14.12.1998	Maths, Biology	B,B
Vivian Lukas	25.12.2003	Chemistry, Physics	C, B
Tania James	7. 11. 1995	Biology	A
Caleb Moses	19. 12.2002	Maths	B
Fatuma Mustafa	1.1.2001	Biology ,Chemistry	B, A

Normalize the table above to:

- 1 NF (3 marks)
- 2 NF (3 marks)
- 3 NF (4 marks)

### QUESTION THREE

- a) i) Explain the meaning of subquery as used in SQL (2 marks)
- ii) Explain a circumstance when subquery is used in SQL (2 marks)
- b) Distinguish between data manipulation language and data query language as used in database management systems (4 marks)
- c) Read the following passage and use it to answer the question that follows
- d) An insurance company needs to store information about car accident claim in its database. Each insured vehicle is identified by vehicle registration number. The vehicle model, the year of manufacture. The owner of the vehicle is identified by ID number, name and contact. A car owner may have more than one vehicle insured. When a vehicle is involved in an accident, the driver is expected to report to the nearest police station where a report number, the location of the accident and the date / time when the accident occurs, the driver's details including ID number, name and driving licence are recorded.

Represent the information using an entity relationship diagram.

### QUESTION FOUR

- a) i) Explain the term database management system. (2 marks)
- ii) outline four advantages of database management system. (4 marks)
- b) Distinguish between each of the following parts of terms as used in database management systems
  - i. Backup and recovery (4 marks)
  - ii. Integrity constrains and encryption (4 marks)
- c) With the aid of a diagram in each case, describe the following database models (6 marks)
  - i. Hierarchical
  - ii. Network