



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

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION  
2020/2021 ACADEMIC YEAR

**FIRST YEAR ONE SEMESTER EXAMINATION FOR, DIPLOMA IT/CS**

UNIT CODE: SIT 051/IT/0S/ICT/CT/7/7

UNIT TITLE: DATABASE MANAGEMENT SYSTEMS

DURATION: 2 HOURS

**Instructions to candidates:**

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

## SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

### QUESTION ONE

- (a) Define the following terms as used in database systems,
- (i) Data base (2 marks)
  - (ii) Data redundancy. (2 marks)
  - (iii) Database management system (2 marks)
  - (iv) Entity (2 marks)
  - (v) Relational database. (2 marks)
- (b) Differentiate between logical and physical view as applied in database management systems. (2 marks)
- (c) Discuss and explain the following database models
- (i) Hierarchical database model (2marks)
  - (ii) Network database (2 marks)
- (d) Distinguish between a schema and an instance. (2 marks)
- (e) Define the term constraints as applied in databases and discuss any three (3) integrity constraints as used in relational DB. (6 marks)
- (f) Differentiate between client/server database system and centralized database system giving an advantage for each. (6 marks)

## SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

### QUESTION TWO

- (a) Explain any **four** DBMS utilities. (4 marks)
- (b) Briefly describe **three** levels of a database schema
- (c) Differentiate between entity type and an entity instance. (6 marks)
- (d) Carefully explain the database system life cycle (6 marks)
- (e) Give and explain any **two** disadvantages of a file based system (2 marks)

### QUESTION THREE

- (a) What is normalization? (2 marks)
- (b) Explain the first **three** normal forms (6 marks)
- (c) Use the following information to draw the relevant ER diagram

Invoice (Invoice-no, Customer Number, Pro-code, date, invoice total)

Invoice Product (Pro-code, Prod-description, Unit price)

- (d) Customer (Customer number, customer –Name, customer –address, del. address) (4 marks)
- (e) Explain any **two** rules that are followed in normalizing a relational database (4 marks)
- (e) The following table is which normal form? Explain. (4 marks)

Students Number	Unit code	Unit title	C.F	marks

#### QUESTION FOUR (20 MARKS)

- (a) Differentiate between a primary key and a candidate key. (4 marks)
- (b) Highlight **four** problems associated with traditional file processing systems. (4 marks)
- (c) Explain how the database approach tends to solve the (b)
- (d) above. (2 marks)
- (e) Explain the following database design concepts
- (i) Normalization (2 marks)
- (ii) Functional dependency. (2 marks)
- (iii) Transitive dependency. (2 marks)
- (iv) Partial functional dependency (2 marks)
- (v) 1 normal formal (2 marks)