MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

DIRECTORATE OF TVET

SECOND YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

DATABASE MANAGEMENT SYSTEMS

DATE: 21/7/2022   **TIME: 8.30-11.30 AM**

INSTRUCTIONS
Answer any five questions

QUESTION ONE (20 MARKS)

a)   Differentiate between sequential file access method and direct file access method. (4 marks)

b)   Explain each of the following concepts in the context of the relational data model.

    i.   relation   (1 mark)

    ii.   tuple   (1 mark)

c)   Identify two notations used to show relationship between entities in an E-R diagram.

    (2 marks)

d)   Identify two limitations of traditional file systems and state how such limitations have been addressed by the database approach.   (4 marks)

e)   Janet, a database architect is supposed to protect the database from various threats. Advise her on two methods she can use to perform this task.   (4 marks)

f)   Differentiate between primary key and foreign key.   (4 marks)

QUESTION TWO (20 MARKS)

a)   Explain each of the following concepts in the context of the relational data model.

    i.   tuple   (2 marks)

    ii.   relational database.   (2 marks)

b)   Describe an E-R model.   (4 marks)

c)   Explain two advantages and two disadvantages of DBMSs.   (8 marks)

d)   Explain the important role played by users in the process of database design.   (4 marks)

QUESTION THREE (20 MARKS)

a)   Outline four main tasks carried out by the Database Administrator (DBA).   (4 marks)

b)   Identify two threats that could affect a database system.   (2 marks)

c)   Explain two advantages of database management systems.   (4 marks)

d)   Describe what relationships represent in an ER model and provide examples of unary, binary, and ternary relationships.   (10 marks)

QUESTION FOUR (20 MARKS)

a)   Define the following terms in the context of database management systems.

    i.   Attribute   (2 marks)

    ii.   Data dictionary   (2 marks)

    iii.   Distributed database   (2 marks)

b)   Explain the following in terms of providing security for a database.

    i.   authorization   (2 marks)

    ii.   backup   (2 marks)

    iii.   encryption   (2 marks)

c)   Describe four components of a database system.   (8 marks)

QUESTION FIVE (20 MARKS)

a)   Explain the relational data model.   (4 marks)

b)   Using a suitable example, explain two entity relationships.   (4 marks)

c)   Janet has been employed as a database administrator by Bentam (K) Ltd. She is mandated to develop a database system for the company.

    i.   Outline the process she could follow to achieve this mandate.   (6 marks)

    ii.   Explain two benefits the system could bring to the company.   (4 marks)

    iii.   Identify two security measures she could incorporate into the system to protect the company data.   (2 marks)

QUESTION SIX (20 MARKS)

a)   Describe the stages of the database system development lifecycle.   (6 marks)

b)   Describe two components of the DBMS environment.   (6 marks)

c)   Distinguish a data warehouse from a data mart.   (4 marks)

d)   Explain two responsibilities of a database administrator.   (4 marks)

QUESTION SEVEN (20 MARKS)

a)   Citing an example in each case, explain two types of attributes in a relational database system.   (6 marks)

b)   Describe what attributes represent in an ER model and provide examples of simple, composite, multi-value, and derived attributes.   (10 marks)

c)   Explain the purpose of Entity Relationship Diagrams in the data modelling activity for database systems.   (4 marks)