



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (ELECTRICAL AND ELECTRONICS ENGINEERING)

BACHELOR OF SCIENCE (MATHEMATICS AND STATISTICS)

EEE207/SST203: DATA BASE MANAGEMENAGEMENT SYSTEMS

DATE: 16/12/2021

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

Answer questions one and any two other questions in this paper.

QUESTION ONE (30 MARKS) [compulsory]

- a) Explain, using your own examples, how the following database concepts are implemented
 - (i) Data integrity (3 marks)
 - (ii) Data validation (3 marks)
 - (iii) Data security (3 marks)
- b) Discuss three database users involved in database design (6 marks)
- c) Define data Anomalies. (2 marks)
- d) Describe the uses of functional dependencies? (6 marks)
- e) Evaluate the properties of a relation. (6 marks)

QUESTION TWO (20 MARKS)

- a) Explain the characteristics of using a primary key during database design. (4 marks)
- b) Using examples, Describe the problems that can occur in a multi-user environment when concurrent access to the database is allowed. (9 marks)
- c) Describe the features of a database. (7 marks)

QUESTION THREE (20MARKS)

Explain the physical data model as used in DBMS.

- a) Identify TWO update anomalies associated with poor database design. (2 marks)
- b) Sharif is a newly recruited database administrator, Explain three roles that he would be expected to perform in his everyday operations. (6 marks)
- c) Describe advantages of using a database system over the use of spreadsheets. (6 marks)
- d) Analyze three components of DBMS. (6 marks)

QUESTION FOUR (20MARKS)

- a) By using real world examples, describe cardinalities as used in DBMS. (8 marks)
- b) Describe the steps involved conceptual database design process (6 marks)
- c) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. (6 marks)

QUESTION FIVE (20MARKS)

- a) Discuss **two** problems that could arise due to interference between concurrent transactions. (4 marks)
- b) Using SQL Commands create a database called ORG (2 marks)
 - i. Create a table in the database created above and call it Worker with the attributes,
 - ii. Insert into worker table three workers and their respective details. (2 marks)
 - iii. Write An SQL Query To Fetch Unique Values of DEPARTMENT From Worker Table. (2 marks)
 - iv. Write an SQL Query to Print Details of the Workers Who's FIRST_NAME Ends with 'A'. (2 marks)
- c) Produce the Third Normal Form of this document by normalization. (8 marks)

ORDER FORM			
Order number: 1234			
Customer number: 9876			
Customer name: Billy			
Customer address: 456 Hightower Street			
City-country: Kisumu Kenya			
Product No	Description	Quantity	Unit Price
A123	Pencil	100	Ksh30.00
B234	Erasor	200	Ksh15.00
C345	Sharpener	5	Ksh80.00