



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
(DICT 13J)

EIS 2203: DATABASE SYSTEMS

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2013
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

Explain the following terms:

- (i) Database
 - (ii) DBMS (Data Base Management System)
 - (iii) Schema
 - (iv) View
 - (v) Foreign key
 - (vi) Data independence
 - (vii) Normalization
 - (viii) Entity
 - (ix) Attribute
 - (x) Data dictionary
- (20 marks)**

Question Two

- a) With the help of diagrams, explain the following database models: **(6 marks)**
- (i) Network
 - (ii) Relational
- b) Explain advantages and disadvantages of DBMS **(6 marks)**
- c) Describe components of a database system **(8 marks)**

Question Three

- a) Explain disadvantages of flat file system as compared to database as system of storing data. **(5 marks)**
- b) Explain the following levels of database system architecture:
- (i) Conceptual level
 - (ii) External level
 - (iii) Internal model
- (6 marks)**
- c) Describe the advantages of centralized database systems **(4 marks)**
- d) Explain the characteristics of distributed database system. **(5 marks)**

Question Four

- a) Describe two-tier database system briefly explaining the component of each tier. **(6 marks)**
- b) Briefly explain the phase of database design **(8 marks)**
- c) Define the integrity constraints of relational database model **(4 marks)**
- d) Explain the following database constraints:
- (i) Domain integrity
 - (ii) User defined integrity
- (2 marks)**

Question Five

Define the following:

- a) (i) 1st Normal form (1NF) (3 marks)
(ii) 2nd Normal form (2NF) (3 marks)
(iii) 3rd Normal form (3NF) (3 marks)
- b) List anomalies that may be present in an unnormalized relation (3 marks)
- c) The relations below are among the relations used in student database to store data students.
(i) StudReg (AdNo, Name, Gender, Town, Address)
(ii) Fepayment (AdNo, Date, Amount)

The primary keys are underlined. The tables below show the instances of occurrence of the reactions.

Std Reg

<u>AdNo</u>	<u>Name</u>	<u>Gender</u>	<u>Town</u>	<u>Address</u>
S001	John	M	Msa	83654
S002	Peter	M	Msa	45671
S004	Mary	F	Nrb	32140
S007	Helen	F	Kis	42315
S009	Ali	M	Kis	3645

Fee Payment

<u>AdNo</u>	<u>Date</u>	<u>Amount</u>
S001	5/08/2013	15000
S002	5/08/2013	16000
S001	6/08/2013	14000
S004	7/08/2013	20000
S001	9/08/2013	35000

Write SQL commands to:

- (i) Retrieve all details of all students
(ii) Retrieve list of all female students from Mombasa
(iii) Total fees paid
(iv) Record 5,000 paid by 'S009' on 10th October 2013
(v) Change the address of student 'S004' to '32100'
(vi) Delete record of student 'S010' who did not pay fees and never reported. (14 marks)