Name: _____ Index No. _____/_____

2920/206
DATABASE MANAGEMENT SYSTEMS
November 2015
Time: 3 hours

Candidate's Signature _____

Date: _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

DATABASE MANAGEMENT SYSTEMS

3 hours

INSTRUCTIONS TO CANDIDATES:

*Write your **name** and **index number** in the spaces provided above.*
***Sign** and write the **date of examination** in the spaces provided above.*
*Answer any **FIVE** of the following **EIGHT** questions.*
Candidates should answer the questions in English.

For Official Use Only.

Question Number	1	2	3	4	5	6	7	8	TOTAL SCORE
Candidate's Score									

This paper consists of 16 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) (i) List **six** examples of Database Management Systems available in the market. (3 marks)

(ii) Describe a relational database management system. (2 marks)

(b) Describe each of the following components of a database:

(i) stored procedures; (2 marks)

(ii) tables; (2 marks)

(iii) triggers. (2 marks)

(c) With the aid of a diagram, describe the **three** schema database architectures. (9 marks)

2 (a) Outline **three** characteristics of an entity in a database. (3 marks)

(b) Describe each of the following criteria for classification of database management systems:

(i) based on data models; (2 marks)

(ii) based on the number of users; (2 marks)

(iii) based on database distribution. (2 marks)

(c) With the aid of an example, distinguish between *integrity* and *domain* constra... used in databases. (5 marks)

(d) With the aid of an example in each case, describe each of the following attributes as used in databases:

(i) simple; (2 marks)

(ii) composite; (2 marks)

(iii) derived. (2 marks)

3 (a) Outline **four** advantages of using indexes in Structured Query Language. (4 marks)

(b) Write a Structured Query language statements equivalent for each of the following relational algebra operations:

(i) projection; (2 marks)

(ii) difference; (2 marks)

(iii) union. (2 marks)

(c) Distinguish between a *data administrator* and a *database administrator* as used in databases. (4 marks)

(d) Alex is in the process of designing a database. Explain **three** phases that he should consider during design. (6 marks)

4. (a) With the aid of an example describe a hypermedia database. (3 marks)

(b) Explain why each of the following is a threat to databases:

(i) loss of integrity; (2 marks)

(ii) loss of availability; (2 marks)

(iii) loss of confidentiality. (2 marks)

(c) In a college, a lecturer may teach many subjects but may not belong to more than one department. The college maintains information of its lecturers' subject area as follows;

Lecturer Number, Lecturer Name, Lecturer Grade, Department Code, Department Name, Subject Code, Subject Name and Subject Level

Represent this information to 3rd Normal Form. (11 marks)

5 (a) (i) Describe the term *repeating group* as used in normalization.

(ii) Outline **three** goals that would be achieved from using a normalized table. (3 marks)

(b) Describe each of the following terms as used in database management:

(i) domain relational calculus; (2 marks)

(ii) query optimizer; (2 marks)

(iii) relational algebra. (2 marks)