

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

CHUKA & THARAKA CAMPUSES

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0150: DATABASE SYSTEMS I

STREAMS: DIP. COMP SCI Y1S2

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 5/08/2019

2.30 P.M - 4.30 P.M.

INSTRUCTIONS:

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTION ONE (30 MKS) (COMPULSORY)

- a) Compare and contrast;
 - i. Candidate key and foreign key (2 marks)
 - ii. Projection and select operations (2 marks)

- b) Explain the following terms;
 - i. authentication (1 mark)
 - ii. SQL (2 marks)
 - iii. Relational database (2 marks)

- c) With reference to degrees of relationships:
 - i. Explain the term degree of relationship (1 mark)
 - ii. With appropriate examples, explain the different degrees of relationship (6 marks)

- d) Brookside dairy have a system of tracking the deliveries made by their cars to the different distributors. You have been working there on attachment and just realized that the system is a file based system. Explain Why would you advice the government to change to a DBMS as opposed to a file based system (10 marks)

- e) Differentiate between the following terminologies with regard to database relationships
 - i. A relation and a relationship (1 Mark)
 - ii. Entity type and an instance of an entity (1 mark)
 - iii. Weak and strong entity (2 marks)

**SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION
QUESTION TWO (20 MARKS).**

a) The following schema forms part of a database held in a relational DBMS.

Hotel(hotelNo, hotelName, city)

Room(roomNo, HotelNo, type, price)

Booking(hotelNo, guestNo, dateFrom, dateTo, roomNo)

Guest(guestNo, guestName, guestAddress)

The underlined attributes forms the primary key for the tables.

- i. Identify the foreign keys in this schema (4 marks)
- ii. Explain how the entity and referential integrity apply to these relations (4 marks)

b) Database security is increasingly becoming important in almost every enterprise. Chuka University ICT manager has requested your advice on several issues on how to make the ERP database more secure. More specifically, he wants you to advice on what counter measures he should employ to counter security threats.

- i. What is a security threat? (1 mark).
- ii. Discuss the factors that he should consider to determine the counter measures to Employ (4 marks)
- iii. What is a view? (1 mark)
- iv. Explain how views could be used to provide security in a database (4 marks)
- v. Discuss how entity integrity constraints contribute to database security (2 marks)

QUESTION THREE (20 MARKS).

a) Write SQL statement that would produce the CUSTOMER table below with the following data types (8 marks)

Column Name	Data Type	Allow Null
CustomerId	int	<input type="checkbox"/>
CustomerNumber	int	<input type="checkbox"/>
LastName	varchar(50)	<input type="checkbox"/>
FirstName	varchar(50)	<input type="checkbox"/>
AreaCode	int	<input checked="" type="checkbox"/>
Address	varchar(50)	<input checked="" type="checkbox"/>
Phone	varchar(20)	<input checked="" type="checkbox"/>

- b) Suppose you are an SQL developer bidding for a new contract with a prestigious organization. The main part of the selection process is a technical interview. As per the interview panel requirements, explain the following terms while explaining what the term stands for, the essence of the functions it provides and a set of example SQL statements (**at least TWO for each**) that implement these functions:
- (i). DDL. **(3 marks)**
 - (ii).DML. **(3marks)**
- c) Write an SQL command that would do each of the following.
- i. Create a new database for fees payments and name it BONUS. **(3 marks)**
 - ii. Display all records and columns from the CUSTOMER_INFO table. **(3marks)**

QUESTION FOUR (20 MARKS).

Use Table1 and Table2 below to answer questions that follows:

Table 1

Customer_I D	F_Name	L_Name	Physical address	Gender	Contact
22	John	Kingori	nyeri	M	07xxxx
37	george	KipKorir	karatina	M	020www
16	Susan	Mutua	nyeri	F	073xxxx
26	george	Kingori	muranga	M	072yyyy

Table 2

order_No	Date ordered	client	Items id	item	quantity
Or1	1/5/20xx	Cl02	It1	Tea bags	9
Or2	4/2/20yy	Cl14	It3	Hand bag	6
Or4	6/7/20xx	Cl26	It1	Tea bags	8
Or13	5/8/20xx	Cl14	It4	fruits	16

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- a) The above tables are part of the database for a certain shop, find an appropriate names for the database and the relations (2 marks)
- b) How would the E-R for the database represented by these relations look like? (5 marks)
- c) With explanation state the;
 - a.i. cardinality of the relationship between the tables (2 marks)
 - a.ii. Participation of each of the tables (2 marks)
- d) In each of the tables list
 - a.i. The candidate keys (2 marks)
 - a.ii. Primary keys (1 mark)
 - a.iii. Foreign keys (1 mark)
- e) If you were to create the two tables and the relationship between them in a Microsoft access database;
 - a. Explain the data types you would chose for each of the attributes in Table 2 (3 marks)
 - b. How would you ensure that the gender field in Table1 only accepts 'f' and 'm' values (2 marks)

QUESTION FIVE (20 MARKS)

- a) Write an SQL statements that would do the following in an mySQL database
 - i. create the two tables as shown in question four above (6 marks)
 - ii. insert the first two record into the table2 as shown in question four above (4 marks)
 - b) Differentiate between the following terminologies in database: (4 marks)
 - i. Logical data independence and physical data independence
 - c) Describe any four components of DBMS. (6 marks)
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