CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF BACHELOR OF COMPUTER SCIENCE

COSC 250: DATABASE SYSTEMS

STREAMS: (BSC COMUTER SCIENCE) Y2 S2 **TIME: 2 HOURS**

DAY/DATE: MONDAY 06/04/2020 **8.30 AM – 10.30 AM**

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Sketch maps and diagrams may be used whenever they help to illustrate your answer
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **No** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely

SECTION A

QUESTION ONE-COMPULSORY: 30 MARKS

a) Identify any 2 areas where DBMS is applied. (2 marks)

b) Explain one advantage and two disadvantages of network database model. (3 marks)

c) Differentiate between data mining and data warehouse. (2 marks)

d) Explain the importance of normalization. (3 marks)

e) Outline the stages of developing a database system. (6 marks)

f) Differentiate between physical and logical view as applied in database. (4 marks)

g) Explain three levels of database normalization. (6 marks)

h) Briefly describe the roles of the following people in client/ server database. (4 marks)
   i) Administrator
   ii) User

SECTION B: 40 MARKS-Answer Any two Question

QUESTION TWO (20 MARKS)

a) An organization would like to store details of employees in a database. Using information in the organization pay slip shown below, normalize the database to 3rd normal form.

(12 marks)

JULY 2010 PAY SLIP	
Employee number…… Name …… Box ……...	
Section code……. Section name…… Rank……...	
Basic Salary	50,000
House allowance	12,000
Travel Allowance	4,000
Medical allowance	2,000
PAYE	12,000
NSSF	2,000
NHIF	1,000
Loan	15,000
Net Salary	38,000
Head of section name……. Head of Section sign:…….	

b) Use examples to explain the following database integrities. (6 marks)

i) Entity
ii) Validity
iii) Referential

c) Differentiate between primary key and foreign key. (2 marks)

QUESTION THREE (20 MARKS)

a) Discuss two advantages of databases over file systems. (4 marks)

b) The details below represent data stored in a patient management health care system.

Admission	Treatment details	Discharge details
Admission number	Treatment number	Discharge number
Gender	Admission number	Admission number
First name	Doctor name	Medicine bill
Last name	Diagnosis	admission bill
Date of birth	Recommendation	other bills
Address	Medication	

i) Identify the most appropriate key to be the primary key for each table then show relationships among the tables. (6 marks)

ii) Describe any four field properties that can be used to enforce validity integrity in any four fields in the tables designed. (4 marks)

iii) Discuss the following database models. (6 marks)

i) Hierarchical
ii) Network
iii) Relational

QUESTION FOUR (20 MARKS)

a) The table below shows details of Students marks in a secondary school.

Stdno	**Fname**	**lname**	**Maths**	**English**	**Kiswahili**	**Total**
4352	James	Kariuki	45	65	45	
4535	Alex	Momanyi	44	76	65	
4536	Agnes	Atieno	54	35	55	
4537	Bernard	Mutuma	33	67	25	
4538	Jane	Chemweno	66	66	33	
4539	Mohammed	Ishmael	43	55	78	

Write an expression that will extract records that satisfy the following conditions.

i) List all students with lname first letter “m”. (2 marks)

ii) List all students who scored 60 and above in English. (2 marks)

iii) List all students with the fname second letter “a”. (2 marks)

iv) List all students who scored between 20 and 60 in Mathematics. (2 marks)

b) Write query expression to for the above table in question 3 to:

i) Calculate total marks for each student. (3 marks)
ii) Calculate average marks for each student. (3 marks)

c) Briefly explain the meaning of the following SQL statements. (4 marks)

i) ALTER TABLE employee ADD (net salary float);
ii) ROLLBACK TO SP2;

c) Differentiate between a trigger and synonym. (2 marks)

QUESTION FIVE (20 MARKS)

a) A bus company operates fleet of buses and would like to design the system. The following

information shows entities involved in the system.

- Each passenger is booked in one bus.
- A driver can drive more than one bus
- Buses travel to different destinations
- The buses can be services in any garage owned by the company

i) Identify entities in the bus company fleet system. (2 marks)

ii) Use an Entity Relation Diagram (ERD) to show relationship among the entities. (6 marks)

iii) Identify at least 4 attributes of each entity. (4 marks)

b) ABC company would like to develop a relational database management system. Advice the management on the stages of developing a database system (5 marks)

c) Explain the function of a database catalogue. (3 marks)
