



UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

REGULAR EXAMINATION

FOR THE DEGREE OF
BACHELOR OF SCIENCE
IN
COMPUTER SCIENCE

COURSE CODE:

COMP 214

COURSE TITLE:

DATABASE SYSTEMS

DATE: 22ND DECEMBER, 2021

TIME: 8.00 AM - 11.00 AM

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

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COMP 214: DATABASE SYSTEMS

INSTRUCTION: ANSWER QUESTION ONE AND ANY THREE QUESTIONS IN SECTION B

TIME: 3 HOURS

SECTION A (Answer all questions)

QUESTION ONE (25 MARKS)

- a) Define what a database is in terms of software and applications and as a storage facility [2mark]
- b) What is a **domain** why is it important in a database? [2marks]
- c) Define a **tuple** and explain its important in a database? [2marks]
- d) Using a relevant examples distinguish between the following terms as used in databases [8marks]
 - i. Buffer pool and Frames
 - ii. Super Key and Foreign Key
 - iii. Domain integrity and Referential integrity
 - iv. Transaction and Schedule
- e) Conceptual Modeling is a process within logical design. Explain any **three** roles it plays in the development of databases? [6marks]
- f) Identify situations where the following types of databases are most appropriate? [3marks]
 - a. Centralized database
 - b. Distributed databases
 - c. Network databases
- g) Using relevant examples, state the functions of the following types of data found in databases [2marks]
 - a. Application metadata
 - b. Database Metadata

SECTION B (ANSWER ANY THREE QUESTIONS)

QUESTION TWO (15MARKS)

- a) What do you understand by the term **inheritance** in the context of object oriented databases? Use a diagram to show how it works in object oriented databases [3marks]
- b) Use a diagram to describe the concept of data dependence in databases and its connection to the architecture of any database [6marks]
- c) Distinguish between the **three** types of data models developed during database design [6marks]

QUESTION THREE (15MARKS)

- a) i. Define an *architecture* and give **two** roles they play in database application and use [3marks]
- ii. Which database user interacts with them [1mark]
- b) You have been assigned to a team as the leader will be developing customer order monitoring database system. You are leading the database design team; you have been asked to identify the following:
- i. **Two** challenges such a database would have [2marks]
- ii. **Two** types of end users of this database [2marks]
- iii. Draw a simple object oriented model to represent this database [7marks]

QUESTION FOUR [15MARKS]

Global Logistics prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, Global Logistics relies on a company-wide information system. Shipped items are the heart of the Global Logistics product tracking information system and cannot be shipped unless money has been wired to the company's bank account that is characterized by AccountNo, AccountName, BankBranch. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the Global Logistics system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard Global Logistics transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute.

- a) Identify all the actors in the scenario above [3marks]
- b) Create a simple use case diagram that captures this information [5marks]
- c) Identify all the possible associations that exist and the entities that participate in them [3marks]
- d) Explain any **two** advantages Global logistics gets by adopting a database for their operations [4marks]

QUESTION FIVE (15MARKS)

Consider the following tables and use them to answer the questions

Book

BookNo	Book Title	Author	Edition	Date
1002	Trial Marriage Husband	Chin Chan	2	2010!!@
2333	Money is not everything	Yang Yu	2	2000
1222	Love and Desire	Mo Ting	3	2003

Authors

AuthorNo	Title	AuthorName	Edition
1002	Trial Marriage Husband	Chin Chan	2
2333	Money is not everything	Yang Yu	2

1222	Love and Desire	Mo Ting	3
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Orders

OrderNo	BookNo	Author	Edition
Or11	1002	Chin Chan	2
Or24	2333	Yang Yu	2
Or12	1222	Mo Ting	3

Publisher

PubNo	PublisherName	Title	City	Edition
P7777	ChinTin publishers	Trial Marriage Husband	Beijing	2
P8886		Money is not everything	Nihau	2
	ChinYu Publishers	Love and Desire	Gwanzhou	3

[1mark]

- OrderNo, Title, Edition are known as _____
- Pick a table of your choice and use it to explain the concept of instances [2marks]
- Identify **three** integrity constraints that have been violated in the tables [6marks]
- Discuss any three factors that you would consider before settling on this type of database [6mark]



UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

**REGULAR EXAMINATION
FOR THE DEGREE OF
BACHELOR OF SCIENCE**

COURSE CODE: COMP 214

COURSE TITLE: DATABASE SYSTEM

DATE: 5TH DECEMBER 2019

TIME: 9.00 A.M. - 12.00 NOON

INSTRUCTIONS TO CANDIDATES

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UNIVERSITY OF ELDORET
DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SEP-DEC MAIN EXAMINATION 2019

COMP 214: DATABASE SYSTEM

Instructions

Duration: 3 Hours

Answer all the questions in section A and only 3 questions in section B.

SECTION A (24MARKS)

1.
 - a) Define the following terms: (12marks)
 - i. Database
 - ii. Database management system
 - iii. File based system
 - iv. Database application program
 - v. Data abstraction
 - vi. Transaction
2.
 - a) Despite being considered an obsolete approach, highlight four benefits of studying file-based approach to data storage. (4 marks)
 - b) Differentiate between the following terms. (8 marks)
 - i. Structural independence and data independence
 - ii. Data dependence and structural dependence
 - iii. Logical data dependence and physical data independence
 - iv. Data and information

SECTION B (36 MARKS)

3. (a)
 - (i) List six examples 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 (5marks)
4.
 - a) Distinguish between a data administrator and database administrator as used in databases(4 marks)
 - b) Alex is in the process of designing a database. Explain three phases that he should consider during design (6 marks)

c) Describe the term repeating group as used in normalization (2 marks)

5.

a) Outline four goals that would be achieved from using a normalized table. (4marks)

b) Describe a relational database management system (2 marks)

c) 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)

6.

a) Outline four types of states that a transaction may be in during processing in a database management system.(4 marks)

b) Distinguish between direct and indirect end users as used in DBMS.(4 marks)

c) Explain the fine costs or risks associated with the database approach. (4 marks)

7.

a) Distinguish between data manipulation language and transaction control as language as used in structured query language (4 marks)

b) Mwaziri intends to design an Entity relationship diagram for a proposed database system outline six procedures guidelines that with enable him meet his objectives.(6 marks)

c) Define database management system. (2marks)

Comp 214: Database Systems (CAT 2021)

- a) Define the following terms (4 Marks)
- Database
 - Database management system
 - Data model
 - Database schema
- b) Write short notes on the following as depicted on DMBS: (6 marks)
- Logical data independence
 - Physical data independence
- c) Discuss the evolution of database system. (9 marks)
- d) Discuss any two components of a database management system (4 Marks)
- e) Distinguish between the terms 'entity' and 'attribute'. Give some examples of entities and attributes that might be stored in a bank database. (4 marks)
- f) Highlight the three pillars of a secured database. (3marks)