



ZIMBABWE EZEKIEL GUTI UNIVERSITY

**FACULTY OF, SCIENCE, TECHNOLOGY, AGRIC AND FOOD SYSTEMS
DEVELOPMENT**

DEPARTMENT OF DATA SCIENCE AND COMPUTER TECHNOLOGY

EXAMINATION PAPER

COURSE CODE : BIS 121
COURSE TITLE : Database Systems
SPECIAL REQUIREMENTS : None
DURATION : 3 Hours
LEVEL : 1.1/1.2
DATE : 23 SEP 2024

INSTRUCTIONS TO CANDIDATES:

1. Answer any 4 Questions from the whole paper.
2. The total Marks for the examination is 100.
3. The marks allocation for each question are indicated in square brackets [] .

Question 1

- a) Name the stages in database design and describe each. [10]
- b) Define a Database [3]
- c) Differentiate between metadata and data [2]
- d) Discuss each of the following concepts in the context of the relational data model:
- a. Relationship. [2]
 - b. Entity. [2]
 - c. Attribute. [2]
 - d. Domain. [2]
 - e. Entity type. [2]

[TOTAL 25]

Question 2

- a) Discuss the disadvantages of the traditional file systems as compared to database systems.[20]
- b) Differentiate between data and information [4]
- c) What is a key in databases[1]

[TOTAL 25]

Question 3

- a. Explain giving examples, the three major problems that might occur in a multiuser environment if concurrency is not well managed. [9]
- b. Describe with the aid of a diagram the following concurrency Control methods with Locking.
- i) Database level locking [3]
 - ii) Table level [3]
 - iii) Page level [3]
 - iv) Row level [3]
- c. What is concurrency control? [4]

[TOTAL 25]

Question 4

- a. Draw alabeled diagram illustrating the two phase locking protocol [10]
- b. Give and explain any three deadlock control techniques [6]
- c. List the different causes of database failure [5]
- d. What do you understand by integrity constrains and give any four examples of integrity constrains [4]

[TOTAL 25]

Question 5

- a. Define a database management System? [2]
- b. Outline the advantages of a database management system DBMS. [8]
- c. Draw and explain the database Development life cycle. [5]
- d. What is an ER diagram? [2]
- e. A Freight company Swift prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, Swift relies on a company-wide information system. Shipped items are the heart of the Swift product tracking information system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the Swift 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 Swift 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. Please create an Entity Relationship diagram that captures this information about the Swift system. Be certain to indicate identifiers and cardinality constraints. [8]

[TOTAL 25]

End of Paper

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