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**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE IN
COMPUTER SCIENCE**

COURSE CODE : CSC 461 E

**COURSE TITLE : DATABASE ADMINISTRATION &
PROGRAMMING**

DATE: 25/04/2023

TIME: 2.00PM-4.00PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

Question One

- a) In a busy network operation center, there have been several cases of security breach. You have been hired as a consultant to help settle the matter. Discuss the approaches you would use to seal the loopholes. [10 Marks]
- b) Discuss some soft skills that a database administrator should possess [4 Marks]
- c) Given user Ali and user Obi are transacting and updating record in the same table, with the aid of a diagram, illustrate a lost update as a result of an inconsistent read. Explain how such a case could be avoided [6 Marks]
- d) Consider a transaction in a banking database where a you want to transfers money from your saving account to your current account, the transaction can consist of four operations
- Check balance your saving account
 - Decrement the saving account
 - Increment your current account
 - Record the transaction in the transaction log
- e) Write the SQL statement that would execute the transaction [4 Marks]
- f) In concurrency access, deadlock among database transactions are inevitable. This renders detection and recovery as the only methods of overcoming deadlocks [6 Marks]
- I. Briefly explain the two mechanisms used in deadlock detention
 - II. Briefly explain the two methods of deadlock recovery

Question Two

- a) Discuss five key security features which every database management software should have. [10 Marks]
- b) You have been hired as a database administrator in a data center. The center is being set up for the first time. Expound on the five factors you would consider while creating a database. [10 Marks]

Question Three

- a) Briefly explain four facilities that DBMS should provide in order to assist with recovery in case a failure occurs [8 Marks]

- b) "There are four important properties of transactions that a Database Management System (DBMS) must ensure to maintain data in the face of concurrent access and system failure". Discuss. [8 Marks]
- c) Briefly explain concept and constrain behind the 2PL [4 Marks]

Question Four

- a) Describe four causes of flawed user authentication. [4 Marks]
- b) A student has been asked to analyze the process of a transaction execution in a database. Explain the states the students may have analyzed. [6 Marks]
- c) Explain four database system actions which can be assigned to a subject to execute on an object. [4 Marks]
- d) Discuss four mechanisms to facilitate restoration of a database quickly and accurately after loss or damage [6 Marks]

Question Five

- a) Discuss each of the following database backup method [4 Marks]
- I. Full
 - II. Incremental
- b) Drake, a database administrator, has been tasked with the role of implementing concurrency control in the company database system. Discuss the techniques he may he have established during the process. [10 Marks]
- c) Highlight **four** levels of locks. [2 Marks]
- d) Distinguish between a lock-based protocol and a time-based protocol [4 marks]