



UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0251: DATABASE SYSTEM II

STREAMS: DIP. COMP SCI

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 16/04/2025

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- 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.
- Marks are awarded for clear and concise answers.

SECTION A (ANSWER ALL QUESTIONS IN THIS SECTION)

QUESTION ONE [30 MARKS]

- a) Define the following terms
- i. Database security [2 Marks]
 - ii. Data replication [2 Marks]
 - iii. Data backup [2 Marks]
 - iv. Database management system [2 Marks]
- b) Differentiate between homogeneous and Heterogeneous distributed databases [4 Marks]
- c) State FOUR back up devices that an organization can use to back up their data [4 Marks]
- d) State FOUR disadvantages of using a centralized DBMS [4 Marks]
- e) Discuss TWO Data Definition Language (DDL) commands in SQL [4 Marks]
- f) Differentiate between system and object privileges [4 Marks]
- g) Explain why a three-tier database systems architecture is preferable to a two-tier [2 Marks]

QUESTION TWO [20 MARKS]

- a) Discuss FOUR security threats in database systems [8 Marks]
- b) Use SQL code to create a role known as “Admin” inside a database known as “db_Student” then grant INSERT, UPDATE and DELETE privileges [4 Marks]
- c) DCL commands are used to enforce database security in a multiple user database environment. Write an SQL command used to assign user “Admin” all the privileges of the student_database [4 marks]
- d) With the aid of a diagram, discuss the 3-tier DBMS architecture [4 Marks]

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QUESTION THREE [20 MARKS]

- a) State and Explain 3 key functions of a database administrator [6 Marks]
- b) Enumerate the difference between any three types of backups [6 Marks]
- c) While giving instances where each one can be best suitably applied, show a clear difference between relational and non-relational databases [8 Marks]

QUESTION FOUR [20 MARKS]

- a) The university is in the process of computerizing the student data management. You have been approached as a consultant to advice on the issue.
 - i. Clearly explain why distributing the data would be a better option than consolidating it at one point. [2 Marks]
 - ii. Advise the management on the following two methods used in distributing data; replication and fragmentation, and clearly explain one merit and one demerit of each, citing necessary examples. [6 Marks]
- b) “To the user, a distributed system should look exactly like a non-distributed system”. By explaining any EIGHT (8) design principles of distributed database system, qualify the above sentence. [12 Marks]

QUESTION FIVE [20 MARKS]

- a) Explain the following terms as used in databases [4 Marks]
 - i. Distributed Database Management Systems
 - ii. Client-server architecture.
 - b) Briefly explain how authentication can be used as a security measure for a database server. [3 Marks]
 - c) Explain any five biometric methods used for server authentication. [10 Marks]
 - d) Differentiate distributed database from distributed database management system [3 Marks]
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