



KENYATTA UNIVERSITY
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
INFORMATION TECHNOLOGY
SIT 301 : DATABASE ADMINISTRATION

2ND SEMESTER 2023/2024

TIME: 2 HOURS

INSTRUCTIONS: ANSWER QUESTION 1 AND ANY OTHER TWO QUESTIONS.

Question 1

- a) "The long-running debate between proponents of Command Line Interfaces(CLI) and Graphical User Interfaces(GUI) highlights important trade-offs".
- i) Compare and contrast CLI and GUI-based database administration tools by presenting two well explained advantages and two well explained disadvantages of each approach.
(8 Marks)
 - ii) List four of the popular GUI commercial products that could prove useful to a MySQL database administrator.
(4 Marks)
- b) In a context of database security, highlight the distinguishing aspect(s) of the following data access models and bring out the advantages and disadvantages commonly associated with each of the models:
- i) Discretionary access control (DAC)
 - ii) Mandatory access control (MAC)
 - iii) Role-based access control (RBAC)
(12 Marks)
- c) "The database administrator, it seems, needs to be everything to everyone"
- i) Discuss the various tasks and responsibilities of a database administrator and propose strategies for prioritizing tasks, managing deadlines, and balancing competing demands effectively.
(10 Marks)
 - ii) In recruitment of a database administrator, many present day organizations demand for more than a university degree in computing or related subjects. What other "*additional*s" could an aspiring database administrator pursue to maximize their career potential?
(6 Marks)

[Total: 40 Marks]

Question 2

- a) By use of supporting examples of scenarios, discuss potential benefits that could accrue from the use of stored procedures in database administration.
(8 Marks)

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- b) A university's Scholarships Office needs to calculate the total amount of scholarships awarded to students for the current academic year. Design a stored procedure named `CalculateScholarshipTotal` that retrieves data from the `scholarships` table and calculates the sum of scholarship amounts awarded. The procedure should take the academic year as input and return the total scholarship amount awarded for that year.

(7 Marks)

[Total: 15 Marks]

Question 3

- a) Outline the significance of database performance management.

(5 Marks)

- b) Identify and briefly explain five of the key metrics used in database performance monitoring.

(10 Marks)

[Total: 15 Marks]

Question 4

- a) Contrast between the typical application of triggers and events in the context of a database management system.

(6 Marks)

- b) A university's Scholarships Office wants to maintain a history of changes to scholarship amounts awarded to students. Define a trigger named `ScholarshipHistory` that fires after an `UPDATE` operation on the `scholarships` table. The trigger should insert a record into the `scholarship_history` table containing the old and new scholarship amounts, along with the student ID and timestamp of the change.

(9 Marks)

[Total: 15 Marks]

Question 5

- a) Briefly discuss three emerging trends and technologies in database backup and recovery. In your discussion evaluate each trend's potential impact on improving data resilience, scalability, and cost-effectiveness in modern database environments.

(9 Marks)

- b) With the aid of suitable illustrative examples, outline two facilities available by SQL to implement user management.

(6 Marks)

(Total: 15 Marks)