



MACHAKOS UNIVERSITY

University Examination for 2019/2020

SCHOOL OF ENGINEERING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR EXAMINATION FOR

BACHELOR OF SCIENCE (MATHS & COMPUTER SCIENCE)

SIT 301: DATABASE ADMINISTRATION

DATE: JAN - APRIL 2020

TIME: 2 HOURS

INSTRUCTIONS:

PLEASE READ THE INSTRUCTIONS CAREFULLY.

- You have TWO (2) hours to complete this test.
- This is an OPEN book exam, you may refer to your books, notes or any resources online.
- You must answer exam questions independently and may NOT try to obtain outside help of any kind.
- Don't copy and paste directly from the internet.
- You Must Handwrite your Work
- SCAN or Take a photo of your work
- Compile in one document
- Include your student details to identify your work
- Finally submit your work through the e-learning system

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

SECTION A

Question 1 (30 Marks) (compulsory)

- a) A database administrator plays a critical role in any organization. Analyze four aspects which may determine the failure or success of a database administrator.
(8mks)
- b) Given user A and user B are transacting and updating record in the same table, with the aid of a diagram, simulate a lost update as a result of an inconsistent read, clearly indicating the best way to recover the transaction
(6mks)

- c) While setting up a database for remote log in, several aspects must be taken into account. evaluate three parameters used in the setup and their implications.
(6mks)
- d) 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. Illustrate three approaches you would use to seal the loopholes.
(6mks)
- e) You have been hired as a database administrator in a data center. The center is being set up for the first time. Highlight four factors you would consider as you creating a database.
(4mks)

SECTION B:

Question 2 (20 Marks)

- a) A database administrator was invited to a board of management meeting to substantiate his choice of a database management system which he had advised the organization to procure. Most of the board members had little understanding about a database system. Assume his role and negotiate with the board to convince them on why your choice of database system is the best. (8mks)
- b) While creating a database, an administrator can use various methods. Analyze three methods, clearly indicating the most suitable circumstance under which to apply each. (9mks)
- c) Show the difference in two Database authentication methods of your choice, in a Local Area Connection. (3mks)

Question 3 (20 Marks)

- a) User identification and authentication are critical aspects in a database system. Analyze how a database system may fail to identify and authenticate a user. (2mks)
- b) Propose two methods to solve user authentication flaws in database management systems.(4mks)
- c) Differentiate between a role, a privilege and a right, clearly indicating their relationship (4mks)
- d) Articulate four Mechanisms which may be put in place to facilitate restoration of a database quickly and accurately after loss or damage
(4mks)
- e) While creating a database, there are various methods which a database administrator may use. Synthesize the critical role played by DBCA in such circumstance (6mks)

Question 4 (20 Marks)

- a) In database administration, backup is a very critical aspect. While choosing a database management system, compare five aspects of the backup facilities that would guide you into making your choice of DBMS for an organization.
(5mks)
- b) Give a breakdown of five aspects about the journalizing effect of a database system. (10mks)
- c) Database performance is determined by several parameters. Determine five aspects of database system that a database administrator needs to monitor. (5mks)

Question 5 (20 Marks)

- a) Databases are bound to fail due to various factors. Analyze **four** options that a database administrator can choose to respond to the failure, indicating the circumstances most suitable for each. (8mks)
- b) In assigning roles to users, there are object execution options available for the database administrator, from which he may assign a user. Discuss two guiding principles in making such a decision about which user should do what task, (4mks)

c) Simulate the four types of locks in a database real-time environment.

(8mks)