



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 304: ADVANCED DATABASE SYSTEMS

DATE: 24/3/2021

TIME: 8.30-10.30 AM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) List four roles of a database administrator (4 marks)
- 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. (6 marks)
- c) Discuss two Database authentication methods in a Local Area Connection. (4 marks)
- d) While setting REMOTE_LOGIN_PASSWORDFILE, several aspects must be taken into account. Discuss three which can be set on this parameter and their implication. (6 marks)
- e) 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 three approaches you would use to seal the loopholes. (6 marks)
- f) 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 while creating a database. (4 marks)

QUESTION TWO (20 MARKS)

- a) Enumerate four key security features which every database management software should have. (4 marks)
- b) While creating a database, and administrator can use various methods. Discuss three such methods (6 marks)
- c) Explain the role of the following in integrity control (10 marks)
 - i. Views
 - ii. Integrity Controls
 - iii. One type Domain
 - iv. Assertions
 - v. Triggers

QUESTION THREE (20 MARKS)

- a) List three causes of flawed user authentication. (3 marks)
- b) Propose two methods to solve user authentication flaws in database management systems. (4 marks)
- c) List four database system actions which can be assigned to a subject to execute on an object. (4 marks)
- d) List four Mechanisms to facilitate restoration of a database quickly and accurately after loss or damage (4 marks)
- e) While creating a database, DBCA is very useful in some circumstances. Discuss three advantages of using DBCA in database creation. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Explain five back up facilities in a database management system. (5 marks)
- b) Discuss the journalizing aspect of a database system. (5 marks)
- c) Database performance is determined by several parameters. Determine four aspects of database system that a database administrator needs to monitor. (4 marks)
- d) Define the following terms as they relate to database administration (6 marks)
 - i. Tablespace
 - ii. Instance

- iii. Data dictionary
- iv. Redo log
- v. Shema
- vi. Timestamp

QUESTION FIVE (20 MARKS)

- a) Databases are bound to fail due to various factors. Discuss **four** options that a database administrator can choose to respond to the failure, Indicating the circumstances most suitable for each. (8 marks)
- b) Discuss the following terms (4 marks)
 - i. Concurrency control
 - ii. Serializability
- c) Highlight **four** levels of locks. (4 marks)
- d) With the aid of a diagram, show how roll forward database recovery works. (4 marks)