



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY EXAMINATION FOR DIPLOMA IN CYBER SECURITY

2nd Year 1st SEMESTER 2024/2025 ACADEMIC YEAR

MAIN REGULAR

COURSE CODE: ISD 1202

COURSE TITLE: DATABASE SECURITY

EXAM VENUE: STREAM: (DIP. CYBER SECURITY)

DATE: EXAM SESSION: SEPT – DEC 2024

TIME: 2.00 HOURS

Instructions:

This paper consists of two sections A and B

- i. Attempt **ALL** questions in section A and any **THREE** in section B
- ii. Candidates are advised not to write on the question paper.
- iii. Candidates must hand in their answer booklets to the invigilator while in the examination room.

SECTION A (40 MARKS)
(Answer All questions in this section)

1. Define what a Database is and explain its primary purpose. (2 Marks)
2. What is a Database Management System (DBMS)? Give an example. (3 Marks)
3. Differentiate between Relational Databases and NoSQL Databases. (4 Marks)
4. Explain what In-Memory Databases are and provide an example of their use. (3 Marks)
5. What is the main advantage of using Cloud Databases over traditional databases? (2 Marks)
6. What type of database is most suitable for applications with hierarchical data models like organizational structures? (2 Marks)
7. Name TWO tools used for managing relational databases and describe their function. (4 Marks)
8. What are the key features of Object-Oriented Databases? Provide an example. (3 Marks)
9. What is SQL Injection and why is it considered a significant threat to databases? (3 Marks)
10. Describe one common vulnerability associated with weak authentication mechanisms in databases. (2 Marks)
11. What is the principle of 'Least Privilege' in database security? (2 Marks)
12. What are the potential risks of improper handling of database backups? (3 Marks)
13. What are the potential risks of improper handling of database backups? (3 Marks)
14. Identify TWO methods for protecting sensitive data in transit over a network. (3 Marks)
15. What is Database Activity Monitoring (DAM) and why is it important? (1 Mark)

SECTION B (60 MARKS)
(Answer ANY THREE questions from this section)

16. (a) Why is it important to regularly install patches for your database system? (10 marks)
(b) Describe the general steps involved in applying a database patch to a production system. (10 marks)
17. (a) Explain the role of Database Security Management Systems (DSMS) in database security. (10 marks)
(b) What are the main components of a Database Security Management System, and how do they contribute to securing the database environment? (10 marks)
18. (a) Discuss the significance of database security monitoring in maintaining the security of a database system. (10 marks)
(b) What tools and techniques can be used to monitor database security effectively? Provide examples. (10 marks)

19. (a) Discuss tools and techniques used in vulnerability scanning, risk assessment, and penetration testing to ensure database security. (10 Marks)
- (b) Discuss the key factors that must be considered before applying a patch to a production database. In your answer, include the challenges that might arise during the patch management process and how these can be mitigated. (10 Marks)