

061206T4CYB

CYBERSECURITY TECHNICIAN LEVEL 6

SEC/CU/CS/CR/07/6

Secure Databases

March/April 2026



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL
(TVET CDACC)**

WRITTEN ASSESSMENT

Time: 2 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on this question paper.

This paper consists of FOUR (4) printed pages.

*Candidates should check the question paper to ascertain that all the pages
are printed as indicated and that no questions are missing*

SECTION A (40 MARKS)***Attempt All Questions in This Section***

1. A database administrator is analyzing system logs to detect security incidents. Identify FOUR types of database logs used for security monitoring. (4 marks)
2. A university database has users classified as students, lecturers, and administrators. State THREE access control methods applicable in a university database. (3 marks)
3. A table named accounts stores username, last_login, and status. The cybersecurity team needs to identify user accounts that are *inactive*; as such accounts may pose a risk of unauthorized access. Write an SQL statement to select all accounts where the status is '*inactive*'. (3 marks)
4. During installation of a database security management system, hardware requirements must be considered. State FOUR hardware factors that affect database system performance. (4 marks)
5. A mobile application stores user profiles locally and synchronizes data to the cloud when internet connectivity is available. Classify the database used in a mobile app that stores profiles locally and syncs to the cloud. Use: (2 marks)
 - a) Location
 - b) Data model
6. Jane is developing an integrated system to manage a hospital's revenue collection and staff records across different departments using a relational database. Highlight THREE advantages of using a relational database for managing a hospital's revenue and staff records. (3 marks)
7. An organization stores user details in a table called users. Using Table 1 below, write an SQL statement to display all users whose role is '*administrator*'. (3 marks)

User_id	Username	Role
1	jwangare	administrator
2	akimani	user
3	mnyaga	administrator

Table 1.

8. An organization delays installing database patches due to fear of system downtime. State THREE control measures that can minimize this downtime. (3 marks)
9. A database administrator maintains a database table named security_incidents that logs detected system breaches. The table includes incident_id, incident_type, and severity fields. The team

needs to prioritize critical threats for immediate response. Write an SQL query to display all incidents with a severity categorized as 'High'. (3 marks)

10. While reviewing logs, suspicious activities are noticed. Identify FOUR indicators of potential database security breaches. (4 marks)

11. A technician is deploying a database security system. State FOUR database security management systems that can be deployed. (4 marks)

12. To reduce the risk of data breaches and ensure system integrity, the ICT department plans to apply database patches as part of its security management strategy. State FOUR benefits of such an exercise. (4 marks)

SECTION B (60 MARKS)

Attempt ANY THREE question in this section.

13. A university database experiences frequent unauthorized login attempts and slow system performance. The IT team suspects database threats.

a) Explain FIVE database threats that could affect the system. (10 marks)

b) Explain FIVE factors to consider when testing database security vulnerabilities. (10 marks)

14. A financial institution experiences data loss due to ransomware attacks and must strengthen its database backup strategy.

a) Explain FIVE elements of an effective backup strategy. (10 marks)

b) Describe FIVE activities involved in monitoring and auditing database backups. (10 marks)

15. A national examination body plans to deploy a database system that will be accessed simultaneously by thousands of users during result release. The system must ensure data consistency, high availability, and cost efficiency.

a) Explain FIVE methods of ensuring database concurrency. (10 marks)

b) Explain FIVE risks of poor database concurrency. (10 marks)

16. A penetration test reveals that a company's database server is exposed to the internet, uses default credentials, and lacks encryption.

a) Explain FIVE factors to consider when conducting a comprehensive database security assessment. (10 marks)

b) Recommend five controls to mitigate the risks of internet exposure, default credentials, and lack of encryption. (10 marks)

THE END