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071306T4EEN

Electrical Enginering (Power Option) Level 6

ENG/OS/PO/CR/05/6

Install Security Systems

July/August 2023

Time: 3 Hours

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

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WRITTEN ASSESSMENT

3 HOURS

INSTRUCTIONS TO CANDIDATE:

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** questions in sections A and B in the answer booklet provided.*

Marks for each question are indicated in brackets.

Do not write on this question paper.

*Answer the questions in **English.***

This paper consists of four (4) printed pages.

Candidate 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)

*Answer **ALL** questions in this section*

1. State two design components that need to be identified when designing a security system. (2 marks)
2. Explain why it is important to perform wiring design in line with the IEE regulations when designing a security system. (4 marks)
3. Enumerate three marking points commonly used in marking out security system zones. (3 marks)
4. Identify two cable types that are commonly used in laying system cables for security systems. (3 marks)
5. Explain the significance of labelling accessories as per their functions when mounting accessories in a security system (4 marks)
6. Give two examples of tests that are performed to test the security system's functionality and explain why it's undertaken. (4marks)
7. Identify one regulatory body whose requirements should be adhered to when designing a security system. (2 marks)
8. State one environmental condition that should be considered when laying cables for a security system. (2 marks)
9. Explain why termination of system cables should be performed as per the IEE regulations. (4 marks)
10. Enumerate two tests that are commonly performed to test the security system's firmness of installation and explain why the tests are important. (4 marks)
11. Identify two types of tests that are performed to test the continuity of a security system. and explain why the tests are important. (2 marks)
12. Discuss the importance of performing insulation resistance tests as per the IEE regulations for a security system. (6 marks)

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SECTION B (60 MARKS)

Answer any three questions in this section

13. You are a security systems engineer at LINDA Solutions, and you have been assigned to design and install a security system for a commercial building.
    (a) Describe four factors that need to be considered when designing the security system. Provide examples to support your explanation. (12 marks)
    (b) Elaborate on the importance of compliance with national and international standards in the design and installation of the security system. (4 marks)
    (c) Discuss the challenges that may arise during the installation process and strategies to overcome them. (4 marks)
14. You are a security consultant at Safe Zone Technologies, and you have been hired to evaluate and optimize an existing security system in a manufacturing facility.
    (a) Explain the differences between passive and active security measures. Provide examples of each and discuss their effectiveness in a manufacturing environment. (10 marks)
    (b) Discuss the role of access control systems in maintaining the security of the manufacturing facility. Elaborate on the different types of access control systems available and their features. (6 marks)
    (c) With examples, explain three methods of surveillance commonly used in manufacturing facilities and discuss their advantages and limitations. (4 marks)
15. You are a project manager at SecureGuard Solutions, and you are tasked with implementing a comprehensive security system for a residential community.
    (a) Discuss the importance of conducting a thorough risk assessment before designing the security system for the residential community. Identify and describe four potential risks that should be considered. (12 marks)
    (b) Explain the concept of zoning in a security system and its significance in residential communities. Discuss how zoning helps in optimizing security measures. (4 marks)
    (c) Elaborate on the integration of various security components, such as alarms, surveillance cameras, and access control systems, to create a robust security system for the residential community. (4 marks)

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16. You are a security systems technician at Securitech Solutions, and you have been assigned to troubleshoot and repair a malfunctioning security system in a corporate office building.

(a) Describe four common issues that can cause malfunctions in a security system. Discuss the troubleshooting steps you would take to identify and resolve these issues. (12 marks)

(b) Differentiate between analog and IP-based surveillance systems. Discuss the advantages and disadvantages of each system and provide examples of their applications in a corporate office building. (6 marks)

(c) Explain the importance of regular maintenance and testing of a security system in ensuring its optimal performance. Discuss the recommended maintenance practices and testing procedures for a corporate office building. (2 marks)

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