



## **MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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### **University Examinations 2024/2025**

**FOURTH YEAR FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF SCIENCE IN  
COMPUTER SECURITY AND FORENSICS**

#### **CCF 3400: IT SECURITY ARCHITECTURE AND DESIGN**

**DATE: DECEMBER 2024**

**TIME: 2 HOURS**

**INSTRUCTIONS:** Answer question **ONE** (Compulsory) and any other **TWO** questions

#### **QUESTION ONE (30 MARKS)**

- a) Explain THREE (3) obstacles that hinder enterprises architecture alignments (6 Marks)
- b) State FOUR (4) advantages of security frameworks to an information technology enterprise (4 Marks)
- c) Describe the key considerations in ensuring the availability aspect of the CIA Triangle (4 Marks)
- d) Compare and contrast the BIBA and Bell-LaPadula (BLP) access control models (4 Marks)
- e) Explain the purpose of a security assessment and outline the stages involved in the security assessment process (6 Marks)
- f) Define IT Security Architecture and explain its importance within an organization's enterprise architecture. (6 Marks)

## **QUESTION TWO (20 Marks)**

- a) Describe any THREE (3) viewpoints in the context of IT Security Architecture as a security goal (6 Marks)
- b) State FOUR (4) ways that an organization like Safaricom can use to achieve access control to secure their customers information (4 Marks)
- c) Using a real-world example, explain how the COBIT framework aids in the governance of IT systems within an organization (6 Marks)
- d) Describe the Concept of AAA in network security architecture (4 Marks)

## **QUESTION THREE (20 Marks)**

- a) Cyber-attacks are inevitable, the cost of security breaches is high and traditional approaches are ineffective. The need for an enterprise IT security framework is obvious. The framework uses different methods and mechanisms to create as comprehensive a security system as possible. It consists of three distinct integrated areas. State and briefly explain these THREE (3) areas included in the IT enterprise security framework (6 Marks)
- b) Describe any TWO (2) importance of the Kerberos trust model in a Kerberos architectural environment (4 Marks)
- c) Outline the Five-Level Compliance Model used in security assessment and security governance (5 Marks)
- d) You have applied as an information security architect in Meru University. Explain the duties and responsibilities of Information Security Architect (5 Marks)

## **QUESTION FOUR (20 Marks)**

- a) Differentiate the NIST CSF and SABSA security frameworks (4 Marks)
- b) A one-dimensional security approach is no longer adequate; today, a multidimensional approach is mandatory to control and monitor the ever-more-sophisticated network threats. Hence when designing security models preventive, detective and responsive measures must be included. State any two of the preventive, detective and responsive measures to be considered when designing a secure enterprise framework. (6 Marks)

- c) Explain the THREE (3) Trust models that one can use when designing security architecture of an organization like MUST (6 Marks)
- d) Discuss the Clark-Wilson and Chinese wall security models and for each state the security service it achieves. (4 Marks)

#### **QUESTION FIVE (20 Marks)**

- a) Briefly describe the SSL architecture, including its protocols as applied in information security (8 Marks)
- b) List the six-step process followed when building an enterprise security architecture (6 Marks)
- c) Discuss any THREE (3) key components of an IT Security Architecture Framework (6 Marks)