



# 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 3402: MOBILE AND WIRELESS FORENSICS AND SECURITY

DATE: JANUARY 2025

TIME: 2 HOURS

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

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#### QUESTION ONE (30 MARKS)

- a) Differentiate between the following
- i. Security Mechanism and Security protocol (2 Marks)
  - ii. Mobile station and base station (2 Marks)
  - iii. Invasive and non-invasive extraction (2 Marks)
- b) Even when everyone has admitted that a mobile related crime has been committed, it is always hard to prosecute in a court of law. State four reasons as to why it is hard to prosecute such cases. (4 Marks)
- c) Explain two reasons as to why, wireless local area networks are very popular in most organizations (4 Marks)
- d) Define the term "U Rule of Thumb" and explain how it is applied during mobile forensic investigation (4 Marks)
- e) Discuss Three anti-forensics techniques that criminals use to circumvent mobile forensics analysis (6 Marks)

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Meru University of Science & Technology is ISO 9001:2015 and ISO/IEC 27001:2013 Certified

Foundation of Innovations

- f) As a forensic expert in a scene of crime, write a short report outlining how you are going to collect, package and document the scene of crime (6 Marks)

**QUESTION TWO (20 MARKS)**

- a) Write short notes on the following
- i. Rule of Evidence (2 Marks)
  - i. Chain of Custody (2 Marks)
  - iii. Forensically sound (2 Marks)
- b) Describe four issues that should be factored during transportation of an acquired mobile device from the scene of crime (4 Marks)
- c) List four mechanisms that can be used to protect mobile operating systems from attacks (4 Marks)
- d) Discuss three elements that describes a secure wireless environment during wireless network implementation (6 marks)

**QUESTION THREE (20 MARKS)**

- a) Define the following terms
- i. On-chip data extraction (2 Marks)
  - ii. Off-chip data extraction (2 Marks)
  - iii. Logical data extraction (2 Marks)
- b) State four qualities of a good forensic team (4 Marks)
- c) Briefly discuss any two tools that can be used for remote data acquisition in mobile devices (4 Marks)
- d) Enumerate how Virtual Private Network (VPN) can be used to enhance security while linking Meru University of Science and Technology Main campus and Meru Town campus. (6 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss two security measures and best practices that you would recommend to secure a mobile device (4 Marks)
- b) Illustrate the process of acquiring data from a SIM card found in a scene of crime (4 Marks)

- c) As an IT advisor for Meru University, describe how would you educate your organization's management about the potential risks and challenges brought about increased number of mobile phones connected in their network. For each challenge, suggest strategies for mitigating such risks (6 Marks)
- d) Investigate a hypothetical case where a company suspects data leaks from its wireless network. Outline the steps you would take to perform security audit for the organization (6 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Define the following components in GSM
- i. Equipment Identity Register (EIR) (2 Marks)
  - ii. International Mobile Equipment Identifier (IMEI) (2 Marks)
  - iii. Home Location Register (HLR) (2 Marks)
- b) Explain two precautionary measures taken to prevent data loss from a volatile memory during data acquisition (4 marks)
- c) Define the term mobile operating system and briefly explain how mobile forensics experts address issues relating to the different types of mobile operating systems by different vendors (4 Marks)
- d) Meru University of Science and Technology is building a mobile forensics lab, as an expert, advice the management on any three factors they need to consider while designing such a lab (6 Marks)