



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR INFORMATION
COMMUNICATION TECHNOLOGY**

4th YEAR 1st SEMESTER 2024/2025 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ITB1403

COURSE TITLE: Advanced Network Management

EXAM VENUE: LAB 15

STREAM: ICT

DATE: 6/1/25

EXAM SESSION: 14-16.00 PM

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

- a) As part of improving your organization's IT practices, you're advocating for better network documentation. Present two specific scenarios where having well-documented network information would provide a significant advantage in managing or troubleshooting the network. **(4 marks)**
- b) You're overseeing the installation of new twisted-pair cabling in an office with various electronic equipment. Explain the primary method used to minimize crosstalk and why this is crucial for maintaining signal integrity in this environment. **(2 mark)**
- c) During a performance review of your organization's network, you notice signal degradation across certain segments. Name this phenomenon and explain its potential impact on network performance and user experience. **(2 mark)**
- d) After implementing significant changes to your company's network infrastructure, you decide to establish a new baseline. Explain the concept of a network baseline and propose a schedule for conducting baseline assessments, justifying your recommendation based on typical network evolution and security considerations. **(4 marks)**
- e) Your organization is expanding its network across multiple locations. Compare static and dynamic routing in this context, explaining a scenario where each would be more beneficial. **(2 marks)**
- f) You're overseeing the development of two network applications: a real-time gaming platform and a file transfer service. Explain why you would choose UDP for one and TCP for the other, highlighting the specific advantages each protocol offers for these applications. **(4 marks)**
- g) During a network troubleshooting session, you need to determine if an issue lies in the Media Layer or Host Layer. Describe the key differences between these layers and how you would approach isolating the problem. **(2 marks)**
- h) In response to increasing cyber threats, your company needs to implement end-to-end encryption for data traveling through both the Internet and intranet. Propose a comprehensive solution, specifying the protocols you would use and explaining how they address the security requirements. **(4 marks)**
- i) As the lead network engineer for a growing e-commerce company, explain three crucial roles of the transport layer in the OSI Model. For each role, provide a specific example of how it contributes to the reliable operation of your company's online platform. **(6 marks)**

QUESTION TWO (20 MARKS)

- a) Your organization wants to protect its network against packet sniffers. Describe two defenses you would implement. For each, explain how it works and how it would help secure your network. **(4 marks)**
- b) You've been asked to create network diagrams to help with troubleshooting. Suggest three types of network diagrams you would create. For each type, explain what information it would include and how it would be useful for diagnosing network problems. **(6 marks)**
- c) Your company is experiencing network slowdowns during peak hours. Propose five ways to manage network traffic and improve performance. For each method, briefly explain how it would help and where you might apply it in your network. **(10 marks)**

QUESTION THREE (20 MARKS)

- a) As a network administrator, you are aware of several tools you need to test your network's performance. State any test you would use, briefly explain what it tests and when you might use it. **(2marks)**
- b) Your team is considering new network management tools. Describe four types of information or functions these tools typically provide. For each, explain how it would be helpful in managing your network. **(8 marks)**
- c) You're updating your company's network documentation. Identify five key elements that should be included in this documentation. For each element, briefly explain why it's important and how it could be used. **(10 marks)**

QUESTION FOUR (20 MARKS)

- a) As part of a sanctioned security assessment, you've been asked to simulate an attack on a company's network to identify vulnerabilities. Outline a five-step attack scenario you would use to test the network's defenses. For each step: Name the attack phase or technique, Explain what you're trying to achieve in this step, Mention a tool or method you might use, Briefly suggest how the company could defend against this step **(10 marks)**
- b) You're troubleshooting network issues in an office building where users are experiencing slow connections and occasional outages. You suspect cable problems might be the cause. Identify five potential cable-related issues that could lead to these problems. For each issue: Briefly describe how

it might affect network performance, explain a simple method to test for or identify this problem, and suggest a solution to fix or prevent the issue. **(10 marks)**

QUESTION FIVE (20 MARKS)

a) As an IT technician, you've been asked to train new team members on common cable issues they might encounter when troubleshooting network problems. Identify five important cable issues for network troubleshooting. For each issue: name the problem, describe how it affects network performance, suggest a simple way to test for or identify the issue and briefly explain how to fix or prevent it

(10marks)

b) You're a network administrator at a medium-sized company. Your manager has asked you to create guidelines for when to escalate network device problems. Briefly identify and describe five types of network issues that would require escalation to senior staff or external support and explain why it needs to be escalated in your answer also Suggest who it should be escalated to (e.g., senior IT staff, vendor support, etc.)

(10marks)