



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF
SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE**

SIT 104 – COMPUTER NETWORK FUNDAMENTALS

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer Question **ONE** and Any other **TWO** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) State the following terms as used they relate to networking. (6 marks)
- i. Network medium
 - ii. Attenuation
 - iii. Nodes
 - iv. NIC
 - v. Jitter
 - vi. Bandwidth
- b) Explain any three factors that influence the choice of a network topology. (6 marks)
- c) State and elucidate three factors to put in consideration in selecting cable type to be used in implementing a network. (6 marks)
- d) With the aid of diagrams, describe the difference between synchronous and asynchronous transmission. (6 marks)
- e) Explain three ways that a network administrator can enforce security in a network. (6 marks)

SECTION A: ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) (i) Anita has 11 computers and 1 printer. She wants to start a cybercafé that also offer printing services. Advise her by explaining to her the type of network to implement in the cybercafé including two merits and demerits in each case. (4 marks)
- (ii) Using a well labelled diagram, design for Anita the cybercafé network layout describing in details the following: (6 marks)
- a. The topology to use and how it works
 - b. The access method the topology will use
 - c. One advantage and one disadvantage of the chosen topology
- b) What are the seven layers of the OSI reference model, in each layer, highlight the protocols that facilitate the functioning of each layer. (7 marks)
- c) List any three services that computer networks provide. (3 marks)

QUESTION THREE (20 MARKS)

- a) Using an example of an application areas in each case, distinguish between:
- i. Radio and microwave transmission (4 marks)
 - ii. Half duplex and duplex transmission. (4 marks)
- b) Using example in each case, discuss any three classification of computer networks based on their geographical scope (9 marks)

- c) Explain why it is necessary to have both IP address and MAC address. (3 marks)

QUESTION FOUR (20 MARKS)

- a) With aid diagrams describe any three types of wired media. (9 marks)
- b) As a network designer, you will most likely use the following devices to enhance the performance of your network. Highlight the scenario where you are likely to use the following devices bringing out clearly the differences between their operations;
(6 marks)
- i. Switch
 - ii. Router
 - iii. Repeater
- c) Use an appropriate diagram to illustrate the component of a communication system. (5 marks)