



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

FOURTH YEAR SECOND SEMESTER REGULAR EXAMINATIONS

**FOR THE DEGREE
OF**

**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY/BACHELOR OF SCIENCE IN
INFORMATION SYSTEMS AND KNOWLEDGE MANAGEMENT**

COURSE CODE: BIT 227

COURSE TITLE: COMPUTER NETWORKS

DATE: 28/04/2022

TIME: 8:00a.m-10:00a.m

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and choose any other Two.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

QUESTION ONE [30 MARKS] – COMPULSORY

MMUST has decided that you are the contractor to design and implement their network at Main Campus. With your limited knowledge, you are expected to make some initial decisions before you commence on the detailed design of the network.

- i Between the OSI reference model and the TCP/IP reference model, which model would you consider to be more useful and why? [2 Marks]
- ii What factors would you consider before you decide what type of network operating system to use on your network? [8 Marks]
- iii What attributes must your network have in order for it to be considered a well-designed network? [8 Marks]
- iv State four factors you will consider when choosing networking devices to use in your network? [4 Marks]
- v What factors will you consider before choosing the type of media to use? [6 Marks]
- vi How will you determine which LAN technology to implement in your network? [2 Marks]

QUESTION TWO (20 MARKS)

As a network administrator, you have two options when it comes to assigning IP addresses to the hosts in your network. Briefly explain:

- i. When it is appropriate to use **Static IP configuration option**. [3 Marks]
- ii. When it is appropriate to use **Dynamic IP configuration option**. [3 Marks]
- iii. Give two advantages and two disadvantages that stateless address auto configuration has compared to DHCP. [4 Marks]
- iv. Describe the steps a client goes through to get an IP address from a DHCP server. [10 Marks]

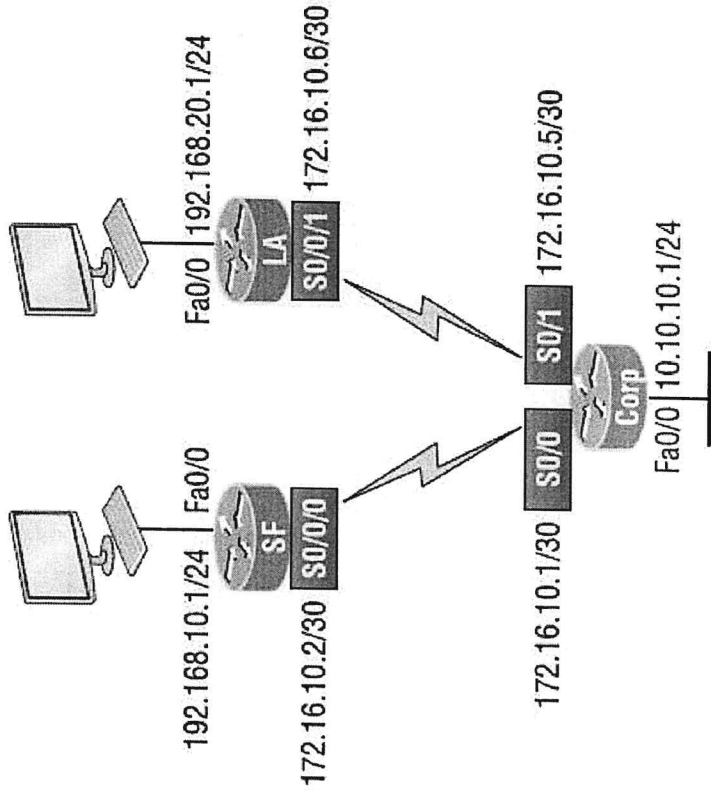
QUESTION THREE (20 MARKS)

- a) State **two advantages** and **two disadvantages** of client/server networks. [4 Marks]
- b) Intermediary devices connect the individual end devices to the network and can connect multiple individual networks to form an internetwork. State any five functions performed by intermediary devices. [5 Marks]
- c) TCP/IP protocols had several important features that allowed them to meet the need for worldwide data communication. Explain briefly any three of these features. [6 Marks]

- d) State **five** major reasons why computers are networked. [5 Marks]

QUESTION FOUR (20 MARKS)

- A. Study the diagram below very carefully:



The computer connected to SF has data to send to the computer connected to LA. Explain in detail how the data packet is addressed in terms of source MAC address, destination MAC address, source IP address and destination IP address at each router interface it passes through until it reaches the destination. [8 Marks]

- b. WANs use numerous types of devices that are specific to WAN environments. Describe any five of these devices [5 Marks]
- c. LAN technologies account for virtually all deployed LANs and specify cabling and signalling at the physical and data link layers of the OSI reference model. With reference to the Token Ring Architecture, explain the process of token passing. [7 Marks]

QUESTION FIVE (20 MARKS)

Due to its recent expansion caused by a higher intake of students, a certain college in Kakamega has been forced to rent and occupy four (4) floors of a 10-storey building. The college intends to use the lower two floors for administration and lecturers' offices and the third floor for computer labs while the fourth one

dedicated for lecture rooms. The college also intends to set up a LAN, which is adequately secure and easy to manage. As the Network Administrator/Engineer, you are:

Required:

- (i). What type of network will you set up for the college? **[1 Mark]**
- (ii). You are required to separate the different departments of the organization and control flow of data between the departments. Explain how this will be achieved. **[7 Marks]**
- (iii). What are the security threats that are likely to occur? Provide a possible solution for each threat. Note: Provide only three (3) threats. **[6 Mark]**
- (iv). Briefly describe a solution that you will provide for the college for Internet connectivity. **[4 Marks]**
- (v). Differentiate between “User Authentication” and “User Authorisation”. **[2 Marks]**