



(University of Choice)

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

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

SECOND YEAR FIRST SEMESTER

SPECIAL/SUPPLEMENTARY EXAMINATIONS

**FOR THE DIPLOMA
OF INFORMATION TECHNOLOGY**

COURSE CODE: DIT 069

COURSE TITLE: DATA COMMUNICATION AND NETWORKS II

DATE: 02/08/2022

TIME: 2:00PM-4:00PM

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer ANY other TWO (2) questions

TIME: 2 Hours

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QUESTION ONE [24 MARKS]

- a) What are protocols? Describe briefly the key elements of a protocol [6 Marks]
- b) With the Aid of a diagram, explain the three modes of data communication that can exist between two communicating devices giving at least one example in each case [6 marks]
- c) Briefly describe any three network topologies, highlighting their architectural design and infrastructure details such as cables, connectors and the respective interlinking devices. [8 Marks]
- d) The effectiveness of a data communication system depends on four fundamental characteristics. Briefly outline the four characteristics. [4 marks]

QUESTION TWO [18 MARKS]

- a) Give any two professional bodies that deals with development of network standards [2 marks]
- b) The county government of kakamega have been running on wireless connectivity. A network specialist advised them to install fiber optics on its offices. Give any **FOUR** benefits they are likely to experience using Fiber optics over wireless media. [4 marks]
- c) For each of the following networks, discuss the consequence if a connection fails. [8 marks]
 - i) Five devices arranged in mesh topology
 - ii) Five devices arranged in star topology (Not counting the hub)
 - iii) Five devices arranged in a bus topology
 - iv) Five devices arranged in a ring topology
- d) Analyze the following modes of communication with reference to cost, speed of transmission and reliability [4 marks]
 - i. Serial
 - ii. Parallel

QUESTION THREE [18 MARKS]

- a) A Variety of devices are used in networking and internetworking. Give any two clear differences in each pair of the following [2 marks]
 - i. Bridge and repeater [2 marks]
 - ii. Switch and Hub [2 marks]
- b) Standards are essential in creating and maintaining an open and competitive market for equipment manufacturers and in guaranteeing national and international interoperability of data and telecommunication technology. Briefly explain the two broad categories of data communication standards. [4 marks]
- c) With the Aid of a diagram, explain the three modes of data communication that can exist between two communicating devices giving at least one example in each case [6 marks]
- d) Explain any **FOUR** ways that network managers can enhance availability and reliability of their networks [4 marks]

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QUESTION FOUR [18 MARKS]

- a) Name and briefly explain the five components of a data communication system [10 marks]
- b) The **OSI Model** or the **Open Systems Interconnection Model** is a conceptual framework which describes the functions of a networking system. It is used for the transfer of data over a network which moves through different layers.
- i) Identify the seven layers of the OSI model. [3 marks]
- ii) Draw a well labeled diagram of the layers of the OSI model showing how data flows from the sender to the receiver. [5 marks]

QUESTION FIVE [18 MARKS]

- a) Network administration tasks fall into two very different categories.: configuration and troubleshooting. Configuration tasks prepare for the expected; they require detailed knowledge of command syntax but are usually simple and predictable. In contrast, network troubleshooting deals with the unexpected. Troubleshooting frequently requires knowledge that is conceptual rather than detailed. State and explain four network troubleshooting tools [8 marks]
- b) Switching can be divided into two major categories. Describe [4 marks]
- c) Differentiate between the OSI model and the TCP/IP model [6 marks]

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