



(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**MAIN EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS**

**FOR THE DIPLOMA
(INFORMATION TECHNOLOGY)**

COURSE CODE: DIT 060

**COURSE TITLE: COMPUTER NETWORKS & DATA
COMMUNICATION**

DATE: 13/10/2021

TIME: 9.00AM – 11.00AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE - COMPULSORY (24 MARKS)

- a. The ISO Reference Model defines seven protocol layers, each of which is responsible for a specific range of functions. By considering this model, explain the main functions performed by a protocol operating at:
- i. The Physical layer [2 marks]
 - ii. The Transport layer [2 marks]
- b. Using proper illustrations, explain how data is transmitted along single mode and multi-mode fibre optic cable. [4 marks]
- c. While bus topology is considered one of the easiest to establish, it is a passive topology that is likely to suffer from a problem peculiar to the topology. Required:
- i. Identify the problem and explain how it is overcome [2 marks]
 - ii. Explain why the topology is referred to as passive. [2 marks]
- d. Using pinout diagrams, demonstrate how T-568A and T-568B standards are used in terminating straight through and crossover cables. [6 marks]
- e. The electromagnetic spectrum range (3KHz to 900THz) can be divided into 4 categories. Using a well labeled diagram explain the characteristics of the first three categories according to their frequency ranges. [6 marks]

QUESTION TWO (18 MARKS)

- a. The data link layer in the IEEE standard is divided into two sublayers: LLC and MAC. Indicate the functions performed by each sublayer. [5 marks]
- b. Explain the main difference between a circuit-switched network and a packet-switched network. Indicate which one would have higher latency and jitter and explain why. [6 marks]
- c. Using proper illustrations, compare and contrast the features of the three modes of network communication in terms of mode/direction of communication performance and provide examples of each. [7 marks]

QUESTION THREE (18 MARKS)

- a. Define protocol and explain the main elements of a protocol. [4 marks]
- b. Mr. Wandahuhu a technician with Linked Systems Technologies is setting up a LAN for a client. Identify four network devices that he would use in setting up the LAN. [4 marks]
- c. Explain the difference between the TWO packet data transfer techniques referred to as "connectionless" and "connection-orientated". [4 marks]
- d. Ssemakula runs a retail shop in Bungoma town with the help of three stand-alone computers. He has had intentions of establishing a computer network but is still skeptical about the technology. Argue for and against this idea in order to help him make informed decision. [6 marks]

QUESTION FOUR (18 MARKS)

- a. Define the term network media and using examples describe the major categories of network media that institutions utilize to connect together devices internally and externally. [6 marks]
- b. State any four factors one would consider in selecting network media [4 marks]

- c. Explain in detail CSMA/CD Protocol and how it detects collision. **[8 marks]**

QUESTION FIVE (18 MARKS)

- d. Explain the following terms giving an application for each. **[6 marks]**
- i. Simplex
 - ii. Half-duplex
 - iii. Full-duplex
- e. Describe clearly the difference between bridges and router in internetworks **[4 marks]**
- f. Explain why standards are necessary in data communication and telecommunication technology and processes. **[4 marks]**
- g. Explain the following terms. **[4 marks]**
- i. TCP/IP
 - ii. FTP