KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

**SECOND YEAR EXAMINATION FOR THE AWARD OF THE
DIPLOMA IN INFORMATION TECHNOLOGY
FIRST SEMESTER, 2023/2024
(AUGUST-DECEMBER, 2023)**

DIT 0202: DATA COMMUNICATION AND NETWORKING

STREAM: Y2 S1   **TIME: 2 HOURS**

DAY: FRIDAY, 12.00 -2:00 PM   **DATE: 01/12/2023**

INSTRUCTIONS
1. *Do not write anything on this question paper.*
2. *Answer Question ONE [Compulsory] and any other TWO Questions.*

Question 1

a) Define data communication and explain with a well labeled diagram the components of a data communication system.   (10mks)
b) What are the advantages of distributed processing?   (4mks)
c) Explain the three criteria necessary for an effective and efficient network.
                                                                                            (6mks)
d) When a party makes a local telephone call to another party, is this a point-to-point or multipoint connection? Explain your answer.   (2mks)
e) You have two computers connected by an Ethernet hub at home. Is this a LAN, a MAN, or a WAN? Explain your reason.   (5mks)
f) Outline three goals of computer networks.   (3mks)

Question two
a) Name the four basic network topologies, and cite an advantages and disadvantages of each type with well labeled diagrams.   (12mks)
b) For n devices in a network, what is the number of cable links required for a mesh, ring, bus, and star topology?   (4mks)
c) What are some of the factors that determine whether a communication system is a LAN or WAN?   (2mks)
d) Assume six devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?   (2mks)

Question Three

a) Why are protocols needed? (2mks)
b) What is the difference between standards and protocols? Differentiate between De facto and De jure standards? (4mks)
c) Explain four characteristics underlying the architecture of the internet. (8mks).
d) Explain 3 tenets of information security with a diagram (6mks)

Question Four

a) Differentiate between peer-to-peer and client-server network models. (5mks)
b) Explain data transmission models with well labeled diagrams and examples giving one limitation of each of the model and one advantage. (10mks)
c) Outline five applications of the internet in Kisii University. (5mks)

Question Five

a) Explain in detail point-to-point and multipoint connection. (4mks)
b) Describe with a neat diagram the functionalities of each layer of the OSI model. (10mks)
c) Distinguish between baseband transmission and broadband transmission with examples. (5mks)