KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE/SOFTWARE ENGINEERING
FIRST SEMESTER 2022/2023
[SEPTEMBER-DECEMBER, 2022]

SOEN 220/COMP 220: DATA COMMUNICATION AND NETWORKS

STREAM: Y2S1 **TIME: 2 HOURS**

DAY: WEDNESDAY, 3:00 – 5:00 PM **DATE: 21/12/2022**

INSTRUCTIONS

1. ***Do not write anything on this question paper.***
2. ***Answer question ONE and any other TWO questions.***

QUESTION ONE

a) Explain the THREE (3) ways through which data can flow between any two devices (6 marks)

b) What is attenuation problem in the transmission of signals and how can it be resolved (4 marks)

c) Justify the need for encapsulation of data in OSI model (4 marks

d) Briefly explain the following concepts in a Data Communication System. (6 marks)

(i) Bandwidth
(ii) Broadband
(iii)Narrowband

e) (i) Highlight the purpose of Protocol and Standard in Computer Networks (4 marks)

(ii) Discuss the key elements of a network communication protocol (6 marks)

QUESTION TWO

a) Briefly explain the types of data transmission modes (6 marks)

b) What is network topology? Explain the different network topologies. (10 marks)

c) Discuss the two major packet switching modes (4 marks)

QUESTION THREE

a) (i) What is multiplexing (2marks)

(ii)Discuss any THREE (3) multiplexing techniques. (9 marks)

b) (i) Why would it be necessary to convert a digital signal to Analog signal during a transmission (2 marks)

(ii)Briefly discuss the modulation schemes used in digital communications (7 marks)

QUESTION FOUR

a) Briefly describe the types of networks based on size and capacity (4 marks)

b) Data communication systems can be used in several different configurations. Explain the THREE (3) types of processing configurations. (6 marks)

c) Using a well label diagram, explain the major components of data communication system (5 marks)

d) Briefly discuss the classifications of data transmission media (5 marks)

QUESTION FIVE

a) Explain the levels of addresses used in an internet employing the TCP/IP protocols (5 marks)

b) Using a well labelled diagram, explain the functions of the layers in the OSI network system reference model (15 marks)