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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 201- DATA COMMUNICATIONS AND NETWORKS

Date: 06TH DECEMBER 2022

Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Clearly explain the difference between the following components of data communication:
 - i) Transmitter and Receiver (2 Marks)
 - ii) Signal and Channel (2 Marks)
 - iii) Repeater and Hub (2 Marks)
- b) Explain the most common data security threats on a network. (4 Marks)
- c) Highlight and explain the three types of data multiplexing techniques. (6 Marks)
- d) Digital devices may transmit data either in parallel or serial way, by use of diagrams, explain the difference between serial data transmission and parallel data. (6 Marks)
- e) Use a well labeled diagram to describe the seven layered structure of an Open System Interconnection Reference Model and explain how data moves from a computer to the hub, the bridge, router and finally the Internet. (8 Marks)

QUESTION TWO: (20 MARKS)

- a) Explain wireless data communication and its two advantages. (5 Marks)
- b) State the five components of data communications system and briefly explain their roles in regard to data communication. (5 Marks)
- c) Discuss the relevance of data encoding and modulation techniques. (5 Marks)
- d) Data communication systems are described in terms of layered protocols. Explain any four network protocols that you know. (5 Marks)

QUESTION THREE: (20 MARKS)

- a) Explain the concept of switching in data communication along its different categories. (6 Marks)
- b) Use diagrams to differentiate between Peer to peer network and a Server based network models. (6 Marks)
- c) Assume that you are the network administrator of your organization and you are asked by the management to define the security measures undertaken to secure your data, describe how would you go about solving the problem? (8 Marks)

QUESTION FOUR: (20 MARKS)

- a) Outline three categories of unguided data transmission media. (3 Marks)
- b) Describe what role a network adapter card plays as a connectivity device in networked communications. (3 Marks)
- c) Signal picks up unwanted random energy, explain THREE such transmission impairments (6 Marks)

- d) Explain how is simplex mode differs with that of half-duplex mode when comes to data communications. Use diagrams to explain. (8 Marks)

QUESTION FIVE: (20 MARKS)

- a) A computer network is created when two or more computers are wired together to share information and resources. Briefly explain other motivations for computer networks. (6 Marks)
- b) Explain four factors to consider when selecting the type of physical media to deploy in a LAN (6 Marks)
- c) Differentiate between TCP/IP Protocol suits and OSI data model. (8 Marks)