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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
SECOND YEAR, FIRST SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN MATHEMATICS
KCS 201 – DATA COMMUNICATIONS AND NETWORKS

Date: 06TH December 2023
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Briefly describe the relevance of the following internetwork technologies in data communications and network
- i) Internet technology (2 Marks)
 - ii) Ethernet technology (2 Marks)
 - iii) Intranet technology (2 Marks)
 - iv) Extranet technology (2 Marks)
- b) Elaborate on the term LAN and explain any three factors that affect the performance of a LAN. (4 Marks)
- c) Describe four measures that must be considered in order to protect and secure general computer networks and their contents. (8 Marks)
- d) Describe the role of the following media access protocols.
- i) Token bus
 - ii) Token ring
 - iii) Token passing (6 Marks)
- e) Differentiate between broadband and baseband signaling (4 Marks)

QUESTION TWO (20 MARKS)

- a) Define the following terms
- i) Encoding (2 Marks)
 - ii) Routing (2 Marks)
 - iii) Network traffic (2 Marks)
 - iv) Network throughput (2 Marks)
 - v) Protocol (2 Marks)
- b) Describe how the following broadcasting methods operates:
- i) Flooding
 - ii) Multi-destination routing
 - iii) Reverse path forwarding (3 Marks)
- c) With the aid of a well labeled diagram, discuss the seven layer OSI model. (7 Marks)

QUESTION THREE (20 MARKS)

- a) i) Define the term VoIP? (2 Marks)
ii) Highlight Four key benefits of VoIP technology. (4 Marks)
- b) Carrier Sense Multiple Access (CSMA) is a network technology that allows for multiple-access of an Ethernet network. Discuss the Three strategies used to deal with collisions in CSMA. (6 Marks)
- c) Describe Four retransmission strategies applied in a data communication channel. (8 Marks)

QUESTION FOUR (20 MARKS)

- a) Outline the architecture of TCP/IP reference model and explain its difference from the OSI model. (4 Marks)
- b) Describe four network security threats that computer users face today. (4 Marks)
- c) Draw the OSI reference model and briefly explain the function of each layer. (6 Marks)
- d) Computer networks are classified based on various factors. Discuss. (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Differentiate between the terms.
 - i) Public networks and private networks (2 Marks)
 - ii) Frequency Division Multiplexing and Time Division Multiplexing (2 Marks)
 - iii) Packet switching and circuit switching (2 Marks)
- b) Explain five application areas of computer networks. (5 Marks)
- c) Explain three reasons why most networking organizations prefer using mesh network topology over daisy chain network topology. (4 Marks)
- d) Explain the concept of switching in data communication along its different categories. Use diagrams (5 Marks)