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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
SECOND YEAR, FIRST SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE
(COMPUTER SCIENCE)

Date: 27th July, 2022
Time: 11.30am – 1.30pm

KCS 201 - DATA COMMUNICATION AND NETWORKS

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Explain the roles of the following data communication terminologies.
 - i) Broadband
 - ii) Bandwidth (4 marks)
- b) Elucidate four reasons why the network designers and administrators require a layering architecture during networking? (4 marks)
- c) Explain three factors that need to be considered for designing the transmission media. (6 marks)
- d) Describe the three classifications of data switching techniques as used in data communication. (6 marks)
- e) By use of a well labeled diagram, name the seven layers of OSI reference model and briefly state their roles. (10 marks)

QUESTION TWO (20 MARKS)

- a) Elaborate on the term LAN and explain any three factors that affect the performance of a LAN (4 marks)
- b) Describe the five main components of data communication circuits. (5 marks)
- c) Using diagrams to illustrate, show your understanding on how mesh topology is better than ring topology. (5 marks)
- c) Multiplexing is a technique used to combine and send the multiple data streams over a single medium. Explain the three classifications of data multiplexing techniques. (6 marks)

QUESTION THREE (20 MARKS)

- a) Many organizations are adopting networking technology to aid in performing their operations. Explain six benefits associated with computer networking (6 marks)
- b) Explain three causes of transmission impairments that any normal network may experience during data transmission. (6 marks)
- c) Describe how the following internetwork technologies are relevant to any busy organization;
 - i) Intranet technology
 - ii) Extranet technology (8 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the relevance of the following data transmission modes. Use diagrams to describe.
 - i) Half-duplex mode
 - ii) Full-duplex mode (6 marks)
- b) Discuss different preventive and control measures that should be considered by security experts in order to secure the information that are on transit over the network. (6 marks)
- c) Explain reasons why wired network technology is more advantageous compared to wireless technology. (8 marks)

QUESTION FIVE (20 MARKS)

- a) By use of well labeled diagrams, describe how serial data transmission and parallel data transmission transmit data digitally. (10 marks)
- b) Data communication systems are described in terms of layered protocols. Name and explain any five networking protocols that you know. (10 marks)