

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF  
SCIENCE IN COMPUTER SCIENCE**

**COSC 260: DATA COMMUNICATION**

**STREAMS: BSC. COMPUTER SCIENCE Y2S2**

**TIME: 2 HOURS**

**DAY/DATE: THURSDAY 13/04/2023**

**11.30 A.M. –1.30 P.M.**

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**Instructions**

- **Attempt question ONE (Section A) and any other TWO from SECTION B**
- **Marks are awarded for clear and concise answers**
- **ONLY the first THREE Questions attempted will be marked (Question one inclusive)**

**SECTION A-Compulsory**

**QUESTION ONE (30 MARKS)**

- a) Differentiate between the following:
- Parallel transmission and serial transmission (4 marks)
  - Broadband signalling and baseband signalling (4 marks)
- b) Discuss four reasons for standards in data communication (4 marks)
- c) Explain three reasons for having layered network architecture (6 marks)
- d) Signals picks unwanted random energy, discuss such three transmission Impairments (6 marks)
- e) We are living in a digital era. Most of the people use computer and internet. Due to the dependency on digital things, the illegal computer activity is growing and changing like any type of crime. Explain any three Web-based attacks. (6 marks)

**SECTION B**

**QUESTION TWO (20 MARKS)**

- a) In large networks there might be multiple paths linking sender and receiver. Information may be switched as it travels through various communication channels. Explain three typical switching techniques available for digital traffic. (9 marks)
- b) It may happen that a sender sends the frame at a faster rate compared to the rate at which the receiver can receive the frames. Well, this may be the case where the sender is running on a much faster machine than the receiver. In such a situation, even if the transmission is error-free, it may happen that the receiver is unable to handle the frames at a faster rate and may lose some of them in the process. Explain two approaches to prevent the above situation. (6 marks)
- c) With an aid of a diagram explain how server-Based network is different from peer-to peer network (5 Marks)

**QUESTION THREE (20 MARKS)**

- a) During transmission, digital signals suffer from noise that can introduce errors in the binary bits travelling from sender to receiver.
- i. Using illustrations explain two types of errors. (6 marks)
  - ii. Explain three error detecting techniques (9 marks)
- b) TCP/IP is the most commonly used set of communication protocols over internet. Illustrate TCP/IP protocol suite and describe its operation in terms of layers (5 Marks)

**QUESTION FOUR (20 MARKS)**

- a) With the help of diagrams explain two types on computer networks. (6 marks)
- b) Explain the operation of CSMA/CD (4 marks)
- c) Explain five factors to consider when selecting the type of physical media to deploy in a LAN (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) As a network designer you will most likely use the following devices to enhance the performance of your network. Highlight the scenarios where you are likely to use the following devices bringing out clearly the differences between the operations of each.

- i. Switch
  - ii. Router
  - iii. Gateway
  - iv. Repeater (8 marks)
- b) Explain the factors that influence the choice of a topology (5 marks)
- c) Describe the three classes of IP address (6 marks)
- d) ) Outline the challenges facing computer network professionals as a result of emerging trends in data communication. (1 Marks)
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