**CHUKA**        **UNIVERSITY**

## UNIVERSITY EXAMINATIONS

### THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE
### OF BACHELOR OF COMPUTER SCIENCE

**COSC 361: COMPUTER NETWORKS**

**STREAMS: BSC. COMP. SCI (Y3S1)**        **TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 24/03/2021**        **11.30 A.M. – 1.30 P.M**

**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) Define the following terms.

    i.    Data rate                                                  [2 marks]

    ii.    Bandwidth                                                [2 marks]

    iii.    Intranet                                                   [2 marks]

    iv.    Extranet                                                 [2 marks]

b) Briefly describe the operation of the following network standards/technologies. For each of the standards, show the frame/packet structure./architecture

    i.    Ethernet                                                [5 marks]

    ii.    FDDI                                                    [5 marks]

a) Given the development of fast Ethernet and gigabit Ethernet, is there a market place for ATM as a LAN                      [4 marks]

b) TCP/IP is seen by many as the way forward and a premiere integration tool. List the possible reasons why this view is held. [4 marks]

c) Explain why fibre optics are considered to be better alternative than copper in LAN installation. [4 marks]

## SECTION B

## QUESTION TWO (20 MARKS)

a) Virtual LAN (VLAN) is created on Layer 2 switch. Explain 4 main types of VLANs depending on the type of the network they carry: [8 marks]

b) Explain three reasons for creating VLANS on the network [6 marks]

c) VLAN can be assigned statically or dynamically. Using static method explain the procedure of assigning VLAN to the interface. [6 marks]

## QUESTION THREE (20 MARKS)

a. Define the term VPN. [2 marks]

b. Explain the types of Virtual Private Network (VPN) Protocols [6 marks]

c. Explain the advantages of implementing a VPN [8 marks]

d. Explain the factors that determine whether a communication system is a LAN, MAN, or WAN. [4 marks]

## QUESTION FOUR (20 MARKS)

a) Firewall is a network device that isolates organization's internal network from larger outside network/Internet. Explain the three basic categories of Firewall. [6 marks]

b) Explain four major benefits a business draws from computer networks [4 marks]

c) State Four factors to consider during network design [4 marks]

d) Using a diagram, show the Four layers of TCP/IP Model. [6 marks]

**QUESTION FIVE (20 MARKS)**

a. Define the term line coding. [2 marks]

b. A digital data stream 0101011001 is passing through a communication system. As we know data stream will be converted to signal through using various schemes. Draw the signal of given bit stream using NRZ- L and NRZ-1. [6 marks]

c. You are a network manager for Chuka University and you are responsible for five networks. You have been asked to internetwork the five as soon as possible. What information should you have to achieve your goals of internetworking the five networks. [6 marks]

d. One interesting problem that occurs in distributed control, token passing system, is that the token may get lost. Indeed, if a token is not properly circulating around network, no station can transmit. Comment on the problem. What safeguard can be built into a token passing network to determine if a token has been lost, and then to restore proper operation on the network. [6 marks]

-------------------------------------------------------------------------------------------------------------------