CHUKA   UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 361: COMPUTER NETWORKS 1

STREAMS: BSC (COMPUTER SCIENCE) Y3S1   **TIME: 2 HOURS**

DAY/DATE: MONDAY 10/12/2018   **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS

Attempt **Question 1 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)   Give **ONE**Differenceand **ONE** similarity between a token ring and FDDI network

[4 Marks]

(b)   Create a Supernet from the following networks: **192.168.55.244** and **192.168.140.120**
[4 Marks]

(c)   Describe the benefits of aggregating routes in large networks   **[4 Marks]**

(d)   Differentiate between Broadcast and Point-to-Point Networks   **[4Marks]**

(e)   Explain the mechanism that Ethernet applies in detection of MAC frame errors

[4 Marks]

(f)   Which command would you type on a windows operating system's command prompt when you want to access the following network information:

(i)MAC address of the NIC   **[2 Marks]**

(ii)IP address of the host   **[2 Marks]**

(g)   Describe **THREE** limitations of dividing a LAN into subnets and using routers to link the subnets   **[6 Marks]**

SECTION B-Attempt Any TWO questions from this section

Question TWO [20 Marks]

LANs provide both speed and cost-efficiency for transmitting data over relatively small geographic areas. However, as organizations expand, businesses require communication among geographically separated sites.

(a)Describe **THREE** examples that justify the need of a W.A.N in an organization **[6 Marks]**

(b)Using a diagram,illustrate the following W.A.N topologies   **[8 Marks]**

    (i) Point-to-Point

    (ii) Hub-and-Spoke

    (iii)Full Mesh

    (iv)Dual-homed
(c)What role do the following devices serve in a wide area network   **[6 Marks]**

 (i)Access server

 (ii)Broadband modem

  (iii)WAN switch

Question THREE [20 Marks]

(a)   Describe CSMA/CD (carrier sense multiple access with collision detection) media access protocol employed by Ethernet LANs   **[10 Marks]**

(b)   Briefly describe the role played by the following fields of a Ethernet frame **[10 Marks]**

       (i)DA

       (ii)Length/type

       (iii)FCS

       (iv)SFD

       (v)Data

Question FOUR [20 Marks]

(a)Identify **TWO** differences and **TWO** similarities between a bridge and a router when deployed in local area networks   **[8 Marks]**

(b)Using a diagram illustrate the CSMA/Collision Avoidance media access mechanism employed by IEEE 802.11 wireless networks clearly showing RTS-CTS exchange**[12 Marks]**

Question FIVE [20 Marks]

(a)   Justify by giving **THREE** reasons why a network administrator may decide to create VLANS in a network   **[6 Marks]**

(b)   A virtual private network (VPN) is a network that uses a public telecommunication infrastructure, such as the Internet, to provide remote offices or individual users with secure access to their organization's network

(i)   Using a diagram, illustrate a VPN connection   **[5 Marks]**

(ii   )Explain TWO limitation of deploying VPNs in an organization   **[4 Marks]**

(c)   Give the devices associated with the following technologies/protocols:

   (i)ATM   **[2 Marks]**

   (ii)X.25   **[3 Marks]**