CHUKA   **UNIVERSITY**

SUPPLEMENTARY / SPECIAL EXAMINATIONS

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

ACSC 261: DATA COMMUNICATION AND NETWORKS

STREAMS: ACSC

TIME: 2 HOURS

DAY/DATE: TUESDAY   17/11/2020   **5.00 P.M - 7.00 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) Explain with the help of schematic diagram the main elements of digital data communication system**.**   **(**6Marks)

b) Consider the TCP connection mechanism.

     i.   State the mechanism used to set up a TCP connection   (1 mark)

     ii.   Why is the mechanism needed   (2 marks)

     iii.   Outline how the mechanism works.   (3 marks)

c) A broadcast network is one in which a transmission from any one attached station is received by all other attached stations over a shared medium. Examples are a bus-topology local area network, such as Ethernet and a wireless radio network. Discuss the need or lack of need for a network layer in a broadcast network.   (6 Marks)

d) Explain the advantages of fiber optic cable   (6 Marks)

e) Explain the operation of the following network devices   (6 Marks).

    a. Switch

    b. router

    c.firewall

SECTION B

Question Two

a) Distinguish between *circuit, message* and *packet switching.*   (9 Marks)
b) Discuss any FOUR functions of the data link layer in detail.   (8 Marks)
c) Describe three types of errors in data transmission.   (3 Marks)

Question Three

(a) Describe the role of the following application layer protocols   [10 Marks]
 (i) DNS
(ii)Telnet
 (iii)SMTP
(iv)FTP
 (v)HTTP
(b) Give **TWO** differences between hub and a switch.   [4 Marks]
 (c) Compare between guided and unguided media in network transmission.   (6 Marks)

Question Four

a) Illustrate with diagrams how the three physical characteristics of carrier wave is modulated having digital data input of 1010011 to digital signal using the following line coding techniques.

    i) NRZ-L   (3 Mark)

    ii) Manchester   (3 Mark)

    iii) Differential Manchester   (3 Mark)

    iv) NRZ-I   (3 Mark)

b) Cyber-attacks and threats are on the increase. Explain the threats and control measures an organization should put in place   (8 Marks)

Question Five

(a)Compare and contrast channels using electrical cables and those using optic cables. (6 Marks)
(b)Give **TWO** applications of satellite communication and **TWO** applications of terrestrial
microwave communication   (4 Marks)
(c)Briefly describe the three forms of analog modulation.   (6 Marks)
 (d)Distinguish Star and bus topology   (4 Marks)

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