

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE**

**COSC 0160: DATA COMMUNICATION AND COMPUTER NETWORKS**

**STREAMS: CERT. COSC**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 05/07/2021**

**2.30 P.M. – 4.30 P.M.**

**INSTRUCTIONS:**

- Answer question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, no reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.

**SECTION A {Attempt ALL questions in this section}**

**QUESTION ONE (30 MARKS)**

- Distinguish between synchronous and asynchronous synchronization techniques  
[4Marks]
- Explain TWO factors that may affect correct interpretation of signals [4 marks]
- State THREE advantages of wireless networks over guided networks [3Marks]
- Briefly discuss the TCP/IP model [3Marks]
- What is the difference between Multicast and Broadcast LAN transmission methods?  
[4 Marks]
- A telephone system with modem allows bandwidth of 3100 Hz. Using Nyquist theory calculate the maximum data rate. [M = 2] [4Marks]
- Differentiate between packet switching and circuit switching [4Marks]
- Explain TWO characteristics of Data Communication [4 marks]

**SECTION B (ANSWER ONLY TWO QUESTIONS)**

**QUESTION 2(20MARKS)**

- a. For each of the following topologies state two advantages and two disadvantages and suggest the most appropriate among them.
- i. Bus topology [4Marks]
  - ii. Star topology [4Marks]
  - iii. Ring topology [4Marks]
- b. While explaining what transmission impairment is, discuss THREE wireless transmission impairments. [8 Marks]

**QUESTION 3 (20MARKS)**

- a. Briefly discuss Shannon capacity [6 Marks]
- b. A complete communicating system will have several layers, using a diagram discuss the OSI model. [14Marks]

**QUESTION 4 (20MARKS)**

- a. As a network architect, discuss FOUR factors you consider when choosing a topology for a client. [8 marks]
- b. A computer network is a group of two or more computer systems linked together. Discuss THREE importance of computer networks [6 Marks]
- c. Briefly discuss Non return to Zero -level (NRZ-L) signal encoding technique [6 Marks]

**QUESTION 5(20MARKS)**

- a. Explain the following transmission modes in data communication, and give appropriate examples in each case
- i. Half- duplex [2Marks]
  - ii. Full – duplex [2Marks]
- b. Discuss FIVE hardware devices required to set up a network [10Marks]
- c. Flow Control aims to ensure sending entity does not overwhelm receiving entity. Briefly discuss Sliding Window Flow Control [6 Marks]
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