CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

CHUKA & IGEMBE

FIRST YEAR EXAMINATION FOR THE AWARD OF
DIPLOMA IN COMPUTER SCIENCE

COSC 0160: DATA COMMUNICATION & COMPUTER NETWORKS

STREAMS: DIP. COMP. SCI Y1S2   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 24/03/2021   **2.30 P.M. – 4.30 P.M**

INSTRUCTIONS:
- Answer all in 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: ANSWER <u>ALL</u> QUESTION IN THIS SECTION

QUESTION ONE (30 MARKS)

a. Define the following Terms in Data Communications:

  i. Bit rate   (2 marks)

  ii. Baud rate   (2 marks)

  iii. Channel   (2 marks)

b. Original data is 1010 which is to be sent. Using Hamming code, calculate the value of

   redundant bits r, and total number of bits transmitted   (6 marks)

NB: d represents total number of bits

c. As a Data communication Student, Explain HOW YOU CAN create a local area network

                                                                                    (4

marks)

d. Differentiate the following terminologies: Data Transfer rate, Bandwidth and Throughput

(6 marks)

e. Why is frequency domain important in Signal Analysis (3 marks)

f. What is the Role of Repeaters in Communication Media (3 marks)

g. List Two Famous Block Encoding Types (2 marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

QUESTION TWO (20 MARKS)

a. Lemark pharmaceuticals is an upcoming business, the owner asks you to design a network for him, what factors do you consider when choosing a topology for the client (10 marks)

b. Discuss FIVE differences between Serial and Parallel Transmission (10 marks)

QUESTION THREE (20 MARKS)

a. List and discuss THREE Data Encoding Techniques (6 marks)

b. Describe in DETAIL, the OSI Model in Network Architecture (14 marks)

QUESTION FOUR (20 MARKS)

a. List 4 Common network topologies (4 marks)

b. Briefly EXPLAIN the difference between a Network Switch and a Network Router and an example of where you apply them (4 marks)

c. From Your understanding of the Sampling Theorem, is there a difference between Sampling Rate and Nyquist Rate in signals?, Explain (4 marks)

d. Describe TWO Error Correction methods (4 marks)

e. Explain where the following Communication Protocols are applied:
   i. Hypertext Transfer Protocol (HTTP) (2 marks)
   ii. Post Office Protocol (POP) (2 marks)

QUESTION FIVE (20 MARKS)

a. ARPANET is considered to be the first iteration of the internet, Write Brief Notes explaining ARPANET's History and Relationship to the Internet (10 marks)

b. List And Explain Three LAN Transmission Methods (6 marks)

c. List Two Advantages & Disadvantages Of Circuit Switching (4 marks)