THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY – DIT 2K 9J

ECS 2309: DATA COMMUNICATION IV

END OF SEMESTER EXAMINATIONS

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

a) Give definition of the following terms
    i)   Non- Return-to-Zero Level   (2 marks)
    ii)   Longitudinal Redundancy generator   (2 marks)
    iii)   User Datagram Protocol   (2 marks)
    iv)   Burst-error   (2 marks)

b) Explain the consequences of the session layer failure in the OSI- model   (6 marks)

c) Assume that a computer wants to send the word "USER"

Character	Ascii code
U	1010101
S	1010011
E	1000101
R	1010010

    i)   Explain how the Vertical Redundancy Check technique is used to detect error during transmission of this data based on even parity bit method   (4 marks)
    ii)   Give one major shortcoming of the Vertical Redundancy Check method   (2 marks)

d) Using a data signal of the bit stream 10110011
    i)   Sketch the signal word to the encoded digital in a Bi-phase digital encoding.
                                                            (4 marks)
    ii)   State the three advantages of the Bi-phase encoding scheme over NRZ scheme
                                                            (6 marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

QUESTION 2 (15 MARKS)

a) Discuss **five** factors to determine network security in an institution   (5 marks)

b) Given the data 010011, sketch the encoded signals on the same frame if the following encoding schemes are used   (10 marks)
    i)   Manchester
    ii)   Differential Manchester
    iii)   NRZ-I

QUESTION THREE (15 MARKS)

a) Given a digital signal data: 110110, predetermined divisor:1101
    i)   Show by calculation how to generate the CRC   (5 marks)
    ii)   Show by calculation how the signal is checked for errors   (5 marks)

b) Study the data below and answer the questions that follow
          F(x)=1001001
          G(x)=11
    i)   Represent the data in polynomial form   (2 marks)

ii)   Calculate f(x) X g(x) in polynomial form   (3 marks)

QUESTION FOUR (15 MARKS)

a) With aid of a diagram drawn on the same axis, describe the following encoding techniques
                                                                     (5 marks)
    i)   Non-Return-to-Zero
    ii)   Manchester(Bi-phase)
    iii)   Differential Manchester

    NB: Assume the bit pattern is 0111000110

b) Explain **five** techniques of enhancing data security in an organization   (10 marks)

QUESTION FIVE (15 MARKS)

a) explain the following functions of the transport layer
    i)   service point Addressing   (3 marks)
    ii)   Flow control   (3 marks)
    iii)   Segmentation   (3 marks)
b) Draw a diagram to illustrate the difference between hop-to-hop and end-to-end data delivery
                                                                     (7 marks)