



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 10J

ECT 2309: DATA COMMUNICATION II

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 level 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 two 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 $f(x) \times g(x)$ 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-Inverse
 - ii) Manchester(Bi-phase)-Mark
 - iii) Differential Manchester-Mark

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)