



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION
TECHNOLOGY**

**UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSc. IT N12/J-FT)**

BIT 2108: COMPUTER NETWORK

**END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2012
TIME: 2 HOURS**

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

- a) Distinguish between peer to peer network and client server networks with the aid of a sketch. **(4 marks)**
- b) (i) Explain why transmitting binary data is more common than transmitting analogue data over computer networks.
- (ii) Explain the reason behind the popularity of serial data transmission over long distance over parallel data transmission. **(4 marks)**
- c) (i) Describe error control as applied in computer networks.

(ii) Describe any **THREE** commonly used error control methods in modern day computer networks. **(8 marks)**

d) Describe briefly the functions of each of the TCP/IP Protocol suite layers. **(8 marks)**

e) (i) Define modulation using **TWO** different examples.

(ii) Distinguish between Frequency Modulation and Frequency Shift Keying with the aid of a sketch. **(6 marks)**

Question Two

a) Encode the following bit stream using the following encoding techniques:

11010000000011

(i) NRZ I

(ii) Biphasic S

(iii) Bipolar AMI with B8ZS + 3

(iv) Bipolar AMI with HDB3

(v) Manchester 802.3 IEEE standard

(vi) Differential Manchester

(12 marks)

b) Describe with the aid of sketch the following pulse modulation techniques:

(i) Pulse position modulation

(ii) Pulse duration modulation

(iii) Delta modulation

(iv) Pulse code modulation

(8 marks)

Question Three

a) Describe in detail the following network topologies with the aid of a sketch.

(i) Star Topology

(ii) Bus Topology

(iii) Ring Topology

(12 marks)

b) Describe any **TWO** common techniques that are used to overcome collisions in computer networks with the aid of a sketch. **(8 marks)**

Question Four

A value added network company XY is in the process of making impact in the world of computer networks, the only drawback being the use of appropriate network devices that they have to use in order to make the desired impact. Required:

(i) Identify **FIVE** commonly used network devices that can have the desired impact if implemented by the company XY

(ii) Describe the function of the FIVE network devices identified in Q4 (a) (i) above. **(20 marks)**

Question Five

a) Describe the following switching techniques with the aid of a sketch:

(i) Packet switch

(ii) Circuit switch

(8 marks)

b) Prove that if the sender and receiver use the same polynomial to encode the following data stream 1001011 that the receiver will not detect any error if no bit changes (inverts) on the way. The polynomial is 1101. **(4 marks)**

c) Describe briefly any **FOUR** optical fibre power losses with the aid of a sketch. **(8 marks)**