THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY – DICT 2K 10J

EIT 2302: DATA COMMUNICATION I

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 1 (20 marks)

a) Explain the **three** (3) types of networks that can be derived from classification of networks by range. (4 marks)

b) Briefly explain the following terms as used in networking:

    i   Base band
    ii Broadband
    iii Half duplex
    iv Full duplex transmission (4 marks)

c) Explain briefly the following physical topologies:

    i   Ring
    ii Star
    iii Bus (12marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

Question 2 (20 marks)

a) State the functions of the following specialized servers:

    (i)   File and print server
    (ii)   Application server

                         (4

marks)

b) Explain the advantages of implementing server based as opposed to peer-to-peer network.
                                    (4
                         marks)

c) Using a diagram describe the construction of an optical fiber cable. (4 marks)

d) Explain the **four** (4) factors to consider when choosing network cable. (4 marks)
e) State the **four** (4) major tasks of a network administrator. (4marks)

Question 3 (20 marks)

a) State the functions of the following specialized servers:

    (i)   DHCP server
    (ii)   Application server (4
      marks)

b) Using a diagram describe the construction of coaxial cable. (4 marks)

c) Explain the **four** (4) factors to consider when choosing network cable. (4 mark)

d) Identify **four** physical threats to computer networks that organizations need to safeguard
(4Marks)

e) Using a diagram explain the fields in the Ethernet frame. (8 marks)

Question 4 (20 marks)

a) Explain **four** advantages of ISDN network. (4 marks)

b) With the aid of a diagram, explain the process of transmission over an Integrated Services Digital Network (ISDN). (6 marks)

c) An Ethernet LAN consists of a router, mail server, and two workstations. The LAN devices are to be assigned IP addresses in their respective order of occurrence. Assuming the IP address block allocated to the site is

   207.125.048.244, write the;

   i.   Netmask for the site
   ii. Router IP address
   iii. Mail server IP address
   iv. Web server IP address
   v.   IP address of each of the workstation
   vi. Sketch the Ethernet LAN   (6 marks)

c) Within the context of network security, explain the following terms;

   i.   Encryption
   ii. Digital signature
   iii. Authentication
   iv. Message integrity   (4 marks)

Question 5 (20 marks)

a) Given data as 10110101, sketch the encoded signals on the same plane if the following encoding schemes are used;

   i.   Manchester
   ii. Differential Manchester
   iii. Non-return to zero inverted   (6 marks)

b) i) Find the binary equivalent of x^4+x^3+x+1
    ii) Find the polynomial equivalent of 100001110001   (2 marks)

c) Calculate the VRC and LRC for the following bit pattern using even parity:

   ⟶ 0011101 1100111 1111111 0000000   (2 marks)

d) During an exercise to configure the computers to the internet use, the following terms were mentioned frequently by the configuration team. Explain each of the terms:

i.   Proxy server
    ii.   Subnet address
    iii.   IP address
    iv.   Client computer
        (10Marks)