TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY
(DIT 2K 10J)

ECS 2308: DATA COMMUNICATION III

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: JULY 2014
TIME ALLOWED: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
 - *Answer Booklet*
This paper consist of **FIVE** questions

Answer question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages
<u>**SECTION A (COMPULSORY)**</u>

Question One (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 connects of a router mail server and two workstation. The LAN devices are to be assigned IP addresses in their respective order of occurrence. Assuming the IP address block located to the site is 207.125.048.244, write the:
   i) Network for the site
   ii) Router IP address
   iii) Mail Serve IP address
   iv) Web Server IP address
   v) IP addresses for each of the workstations
   vi) Sketch the Ethernet LAN **(6 marks)**

d) Within the context of network security, explain the following terms:
   i) Encryption
   ii) Digital signature
   iii) Authentication
   iv) Message Integrity **(4 marks)**

<u>**SECTION B (Answer Any Two Questions)**</u>

Question Two (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 Equavalent of $X^4 + X^3 + X + 1$
   (ii) Find the polynomial Equavalent of 100001110001 **(2 marks)**

c) Calculate the VRC and LRC for the following bot pattern using even parity.

   0011101   1100111   1111111 0000000 **(2 marks)**

d) During an exercise to configure the computer to the internet use, the following terms were mentioned frequently by configuration team. Explain each of the terms:
   i) Proxy Server
   ii) Sabnet Address
   iii) IP Address
   iv) Client Computer

Question Three

a) Explain the following Fault Tolerance Techniques:
   (i)   Hot fixing
   (ii)   Disk duplexing
   (iii)   Disk stripling
   (iv)   Disk Mirroring   **(8 marks)**

b) What are the following data encoding schemes:
   (i)   Non-Return-to-zero inverse (NRZ-I)
   (ii)   Non-Return-to-zero mark (NRZ-M)
   (iii)   Non-Return to-zero Level (NRZ-L)
   (iv)   Bi-phase Level (Split Level Phase)
   (v)   Non-return to zero space.   **(10 marks)**
c) What is Data Privacy?   **(2 marks)**

Question Four

a) Name and state the **THREE** typical IP address lasses showing their ranges.   **(6 marks)**
b) What is trace route and ipconfig as used in networking commands?   **(4 marks)**
c) What are the application areas of the multiplexing process?   **(10 marks)**

Question Five (20 marks)

a) Describe the following terms:
   (i) Auditing
   (ii) Data Encryption
   (iii) Authentication   **(6 marks)**

b) Briefly explain the **SIX** factors to consider when choosing a back-up media. **(6 marks)**

c) Explain the following power problems:

   i)   Black-pit
   ii) Sag
   iii) Surge
   iv) Spike   **(8 marks)**