KABARAK   **UNIVERSITY**

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT AND INFORMATION TECHNOLOGY

COURSE CODE: BMIT 217

COURSE TITLE: COMPUTER NETWORKS AND COMMUNICATIONS

STREAM: Y2S1

DAY: THURSDAY

TIME: 9.00 – 11.00 A.M.

DATE: 26/03/2009

INSTRUCTIONS:

1. **This question paper has six questions**
2. **Answer question one and any other three questions**

PLEASE TURN OVER

QUESTION ONE (40 MARKS) COMPULSORY

    (a) Explain the meaning of following terms
- i.   Server
- ii.   Transceiver
- iii.   FDDI
- iv.   Windowing
- v.   CSMA/CD   (10mks)

    (b) Distinguish between
- i.   Monomode and multimode fibre optic cabling
- ii.   Data and Signal
- iii.   Baud rate and throughput   (6mks)

    (c) What are the conditions that a gateway must meet in order to perform the function of interpreting network systems?   (3mks)

    (d) Differentiate between transport layer and session layer of the OSI reference model system   (5mks)

    (e) Explain five factors to consider when choosing a network topology   (5mks)

    (f) A 47KB document is sent over Ethernet network. Determine the number of possible minimum and maximum frames that can be obtained from this document when broken down into frames by the Ethernet technology   (3mks)

    (g) Describe a class 'B' IP network   (8mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) What is meant by the following terms?
- i.   Static routing
- ii.   Dynamic routing
- iii.   Cut through switching mode
- iv.   Store-and-forward switching mode.   (8mks)

(b) Every Ethernet frame contains control information and follows the same structure. Describe an Ethernet frame.   (8mks)

(c) Describe the features of an Ethernet technology   (4mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) What is a MODEM? (2mks)

(b) Describe ISDN and PSTN (6mks)

(c) The line below is a message sent over a network:
 The data link is all about getting information from one place to a selection of other close, local places. At this layer one does not need to be able to go everywhere globally.
if the message takes 2 milliseconds to be transmitted over the network, determine
      i.   the transfer rate in bps (5mks)
     ii.   baud in kbps (3mks)

(d) Determine the time taken to download a 56kB document by a 33k MODEM.
(4mks)

QUESTION FOUR (20 MARKS) ELECTIVE

(a) Explain what is meant by the term node, and give four examples of network nodes
(4mks)

(b) Distinguish between Network Id and Host Id. (1mk)

(c) Consider the following three sets of IP addresses assigned to three nodes in a network segment: 0.255.255.255, 173.16.173.16, 127.0.0.10. It is realized that the nodes do not communicate when connected. To determine the correctness of the IP address assignment,
      i.   Identify the class, subnet, host ID and network ID of each address (6mks)
     ii.   Determine octet binary numbers for the decimal numbers 255, 173, 16, 127 and 10 that make up the addresses (5mks)
    iii.   Explain the considerations that must have been violated when assigning the IP addresses. (4mks)

QUESTION FIVE (20 MARKS) ELECTIVE
The director of an institution wishes to set up computer network between the director's office, security, and network administrator's office and eventually to the internet. The location of the three offices is as shown in the plan below. The distance between network administrator's office and security office is 600m, and the distance between network administrator's and director's office is 100m.
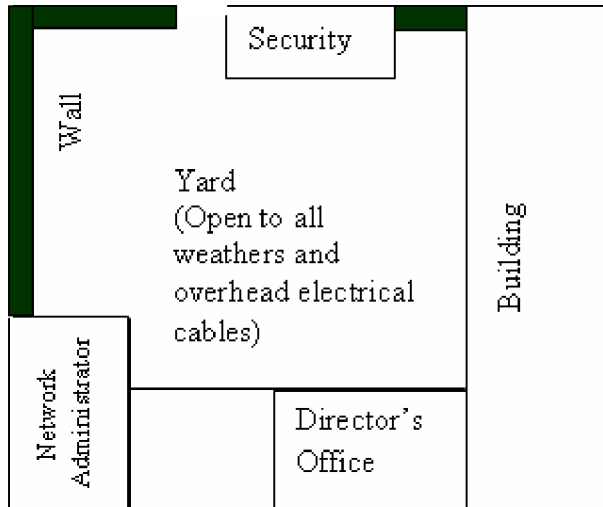
(a). Explain why the best medium choice for connecting network administrator's office to the security office is fibre optics. (10mks)

(b). Apart from cabling, the network devices needed to set up the network include hubs, switches, routers, gateways and NICs. In context of the above set up, explain the functions and appropriate location for these devices (10mks)

QUESTION SIX (20 MARKS) ELECTIVE

(a) What is Wide Area Network (WAN)? (3mks)

(b) Differentiate between private branch exchange and public exchange systems

(2mks)

(d) Explain the following as in signal transmission
   i. Simplex
   ii. Duplex
   iii. Multiplex (6mks)

(e) Discuss packet, circuit and message switching modes giving at least one advantage and one disadvantage of each. (9mks)