

KABARAK



UNIVERSITY

EXAMINATIONS

2008/2009 ACADEMIC YEAR

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN
COMPUTER SCIENCE**

COURSE CODE: COMP 312

COURSE TITLE: COMPUTER NETWORKS

STREAM: Y3S1

DAY: THURSDAY

TIME: 9.00 – 11.00 A.M.

DATE: 26/03/2009

INSTRUCTIONS:

- 1. This question paper has FIVE questions**
- 2. Answer question ONE and any other TWO questions**

PLEASE TURN OVER

QUESTION ONE (30 MARKS) COMPULSORY

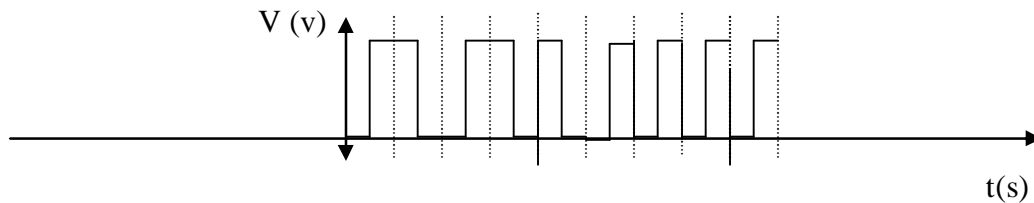
- (a) Explain the meaning of following terms
- i. Server
 - ii. Transceiver
 - iii. FDDI
 - iv. CSMA/CD (8mks)
- (b) Distinguish between
- i. Monomode and multimode fibre optic cabling
 - ii. Data and Signal (4mks)
- (c) What are the conditions that a gateway must meet in order to perform the functions of interpreting network systems? (3mks)
- (d) Differentiate between transport layer and session layer of the OSI reference model system (5mks)
- (e) 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)
- (f) Determine the number of networks and hosts per network for a class 'B' type network (2mks)
- (g) State the encoding rules and limitations for Manchester and Differential Manchester encoding schemes (5mks)

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 do you understand by the term clock synchronization (2mks)
- (b) Compare and contrast Non Return to Zero (NRZ) and Non Return to Zero (NRZ-I) encoding schemes wave formats as a means of converting data to signals to be transmitted over a channel (5mks)
- (c) Determine the input value for the following Manchester encoding scheme (4mks)



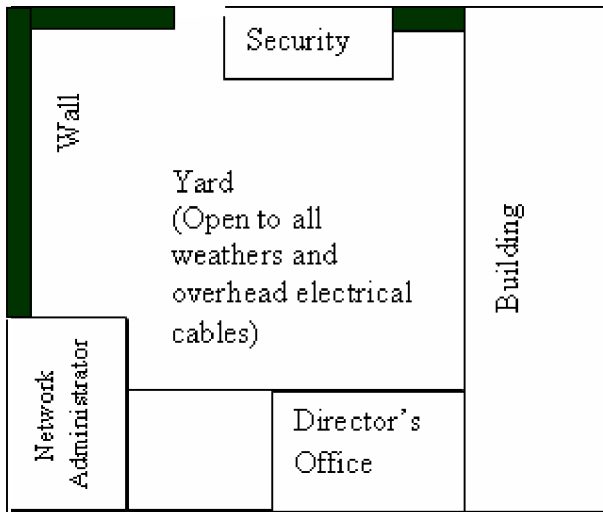
- (d) Plot a Manchester differential graph for the input value 00101110 (5mks)
- (e) A noiseless medium transmits signals between 23 MHz and 33 MHz frequencies. Determine the maximum data capacity the channel can transmit. (4mks)

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,
- Identify the class, subnet, host ID and network ID of each address (6mks)
 - Determine octet binary numbers for the decimal numbers 255, 173, 16, 127 and 10 that make up the addresses (5mks)
 - 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 and security 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)