KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COMP 312

COURSE TITLE: COMPUTER NETWORKS

STREAM: SESSION IV, VI & VII

DAY: WEDNESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 13/04/2011

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. Preamble

ii. Nyquist theorem

(4mks)

(b) Distinguish between

i. *Eavesdropping* and *tapping* as in network security

ii. Bluetooth and Wifi (4mks)

(c) Describe layer 3 issues of the OSI reference model (4mks)

(d) Computer networks are more beneficial in many ways. However they may be a cause of some problems. List and explain any five problems associated with computer networks (5mks)

(e) Demand priority Access method distinguishes four priority class levels in controlling data access to a network. List and explain the four access classes. (4mks)

(f) Consider the IP address: 127.192.127.192

i. Identify the network class, network id, host id and correct sub netting (2mks)

ii. Convert 127_{10} and 192_{10} parts to binary number system (4mks)

iii. Why is it advisable not to allocate this address to a network node? (3mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) Compare and contrast between dynamic routing and static routing (4mks)

(b) As a network designer, you are tendered to design a network for an army barrack zone. Between coaxial, twisted cable and fibre optic cables:

i. Which cabling would you prefer? (2mks)

ii. Explain five issues for your preference (8mks)

(c) A 20dB noisy medium transmits signals between 65 MHz and 85 MHz frequencies. Determine the maximum data capacity the channel can transmit. (6mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) What is clock synchronization? (2mks)

(b) Clock synchronization in Non-Return to Zero encoding scheme is hard to achieve. Explain (3mks)

(c) Data encoding techniques include ASCII, Non-Return to Zero, and Manchester. Discuss Differential Manchester encoding system including at least one advantage and one disadvantage (5mks)

(d) Write down the ASCIID coding binary numbers representing the word *Abc!* (2mks)

(e) Plot a Manchester encoding scheme graph for the ASCII extended coding for the message *Abc!* (8mks)

QUESTION FOUR (20 MARKS) ELECTIVE

(a) Explain the meaning of the term *protocol stack* (2mks)

(b) Give and explain any three functions of a protocol (4mks)

(c) Explain the difference between a class 'A' and a class 'B' IP addresses (8mks)

(d) A network that uses ASCII coding system transmits the word *Bad!* Across it's network. Determine the checksum of the word *Bad!* (6mks)

QUESTION FIVE (20 MARKS) ELECTIVE

(a) Give four examples of network devices that can be configured as gateway (2mks)

(b) Distinguish between

i. Snooping and IP-Spoofing

ii. Encryption and decryption (4mks)

(c) Explain any four log on restrictions employed to secure network systems (4mks)

(d) Signals are usually transmitted in the form of frames.

i. What is meant by the word frame (2mks)

ii. Describe a token ring frame format (8mks)