KABARAK UNIVERSITY

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: **COMP 312**

COURSE TITLE: **COMPUTER NETWORKS**

STREAM: **Y3S1**

DAY: **WEDNESDAY**

TIME: **8.30 – 10.30 A.M.**

DATE: **17/12/2008**

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. Internet
   ii. Checksum
   iii. Network adapter
   iv. Cipher (8mks)

(b) Distinguish between
   i. Infrared and radio transmission waves
   ii. Encryption and decryption (4mks)

(c) write the name of UDP protocol in full, outline its function and state the OSI reference model layer it operates (3mks)

(d) Convert the following
   i. Decimal number 172 to octet binary number (2mks)
   ii. 01010001 binary number to a decimal number (2mks)

(e) One of the advantages of a computer network is that it is more efficient. Identify and explain three ways in which a computer network is efficient (6mks)

(f) State Nyquist theorem (2mks)

(g) Use Nyquist theorem to determine the maximum capacity a channel can carry if it allows a low-pass signal of 80mHz bandwidth (3mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) Distinguish between intelligent and passive hubs (2mks)

(b) Differentiate between static routing and dynamic routing (4mks)

(c) Explain five functions of routers (5mks)

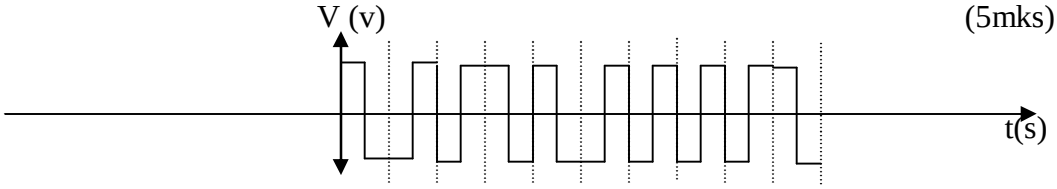
(d) Describe three categories of routers (9mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) What is the difference between data and signal? (3mks)

(b) Describe the difference between Manchester and Differential Manchester encoding schemes wave formats (6mks)

(c) Determine the input value for the following Manchester encoding scheme (5mks)



(d) Describe how CSMA/CD media access method works (6mks)

QUESTION FOUR (20 MARKS) ELECTIVE

(a) i. What is token ring technology? (2mks)

ii. Why do think token ring technology employs Manchester encoding scheme? (2mks)

iii. Describe a token frame structure (10mks)

(b). i. State Shannon's theorem (2mks)

ii. Determine the maximum channel capacity of a 7kHz channel that has a thermal noise of 70dB (4mks)

QUESTION FIVE (20 MARKS) ELECTIVE

(a) Differentiate between data link layer and network layer of the OSI reference model (3mks)

(b) Briefly, discuss the following four classes of IP address: class A, B, C and D (8mks)

(c) One of the functions of a protocol is to cope up with signal error.

i. Describe two ways that a protocol cops up with errors (4mks)

ii. Determine the checksum for the extended ASCII message "Dad" (5mks)