KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: **COMP 222**

COURSE TITLE: **TELECOMMUNICATIONS AND COMPUTERS**

STREAM: **SESSION IV & V**

DAY: **FRIDAY**

TIME: **9.00 – 11.00 A.M.**

DATE: **27/11/2009**

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) Define telecommunication (1mk)

(b) Explain the meaning of the following terms
   i. Simplex
   ii. Signal regeneration
   iii. NIC (6mks)

(c) Distinguish between the following
   i. Hosted PBX and IP-PBX telephone networks
   ii. A repeater and a bridge (4mks)

(d) Compare and contrast baseband and broadband bandwidths (5mks)

(e) State **three** advantages and **three** disadvantages of peer-to-peer and client-server networks (6mks)

(f) An organization wishes to network its three branches within a given region. Among LAN, MAN and WAN, which one among them best suits the organization? Explain.
(4mks)

(g) A document is supposed to take 0.5 seconds in the absence of system delays, to be downloaded by a 128k modem. What is the size of the document if the system has a system delay of 3 seconds? (4mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) Explain the difference between data and signal giving an example of each
(3mks)

(b) Explain the terms (8mks)
   i. *bits,*
   ii. *pulses,*
   iii. *baud rate* and
   iv. *information transfer rate*

(c) A given network operates the speed of 10mbps. What does 10mbps mean?
(2mks)

(d) The line below is a message sent over a network

- *Modems can either be external or internal.*
- *An external modem is a box that is outside the computer. It may be large, portable or pocket size.*

if the message takes 0.1 milliseconds to be transmitted over the network, determine
   i. the transfer rate in bps (4mks)
   ii. baud in kbps (3mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) Explain the following terms as used in telecommunications
   i. unicast
   ii. cync bytes
   iii. message switching (6mks)

(b) One of the factors affecting data transmission is its transmission mode. Compare and contrast synchronous and asynchronous transmission modes (5mks)

(c) During signal transmission, signals usually undergo through signal degradation. Identify and discuss the three transmission flaws, giving remedies to each. (9mks)

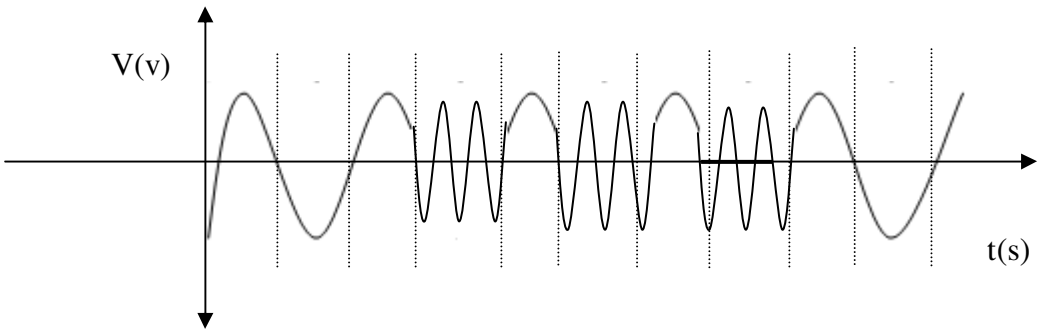
QUESTION FOUR (20 MARKS) ELECTIVE

(a) What is the difference between modulation and demodulation? (2mks)

(b) MODEMs come in various forms and operate and wide speed ranges. Describe the speed ranges that a MODEM can transmit data (6mks)

(c) Apart modulating and demodulating signals modern modems can perform other functions. State and explain six of these functions (6mks)

(d) In modulating of signals, a MODEM codes the normal wave formal as a binary digit 1 compressions as a binary digit 0. Draw a digital wave formal for the following analog signal wave format (6mks)



QUESTION FIVE (20 MARKS) ELECTIVE

(a) Define OSI (2mks)

(b) Describe the importance of OSI in networking (3mks)

(c) Two outstanding protocols used in communications are TCP and IP. Explain difference between these two protocols (6mks)

(d) For each of the following , write their names in full, outline their functions and state the OSI reference model layer they operate

i. ICMP
ii. RJ45
iii. UDP (9mks)