

KABARAK



UNIVERSITY

EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COMP 222

**COURSE TITLE: TELECOMMUNICATIONS AND
COMPUTERS**

STREAM: Y2S2

DAY: TUESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 01/12/2009

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 the following terms
- i. Signal degradation
 - ii. multiplexing
 - iii. FTTP (6mks)
- (b) Distinguish between the following
- i. Synchronous and asynchronous mode
 - ii. A hub and repeater (4mks)
- (c) Compare and contrast bus and ring network topologies (5mks)
- (d) One of the advantages of a computer network is that it is more efficient. Discuss the three ways that makes a computer network more efficient (6mks)
- (a) Discuss Hosted PBX, IP-PBX and mobile PBX giving at least one advantage and one disadvantage of each (6mks)
- (e) Determine the time taken to download a 8kB document by a 128k modem if the system has a system delay of 3 seconds (3mks)

QUESTION TWO (20 MARKS) ELECTIVE

- (a) Explain the following terms as used in telecommunications
- i. Through put
 - ii. Base band
 - iii. Packets (6mks)
- (b) One of the factors affecting data transmission is its switching mode. Compare and contrast circuit switching and packet switching modes (5mks)
- (c) Discuss *unicast*, *broadcast* and *multicast* transmissions giving at least one advantage and one disadvantage of each (9mks)

QUESTION THREE (20 MARKS) ELECTIVE

- (a) What is meant by the term *digital signal*? (1mks)
- (b) Why are digital signals preferred over analog signals in computer networks (2mks)
- (c) Distinguish between baseband and broad band bandwidths (2mks)
- (d) Explain the terms *bits*, *analog signal*, *baud rate* and *data transfer rate* (8mks)

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

Telephone networks are divided into two types: i. PSTN (Public Switched Telephone Network) which is similar to the internet), ii. PBX (Private Branch Exchange), a privately owned network.

if the message takes 0.5 milliseconds to be transmitted over the network, determine

- i. the transfer rate in bps (4mks)
- ii. baud in kbps (3mks)

QUESTION FOUR (20 MARKS) ELECTIVE

- (a) What is network protocol stack? Give an example of a protocol stack (2mks)
- (b) State six issues in networking that prompted International Standards Organization to develop OSI reference model (3mks)
- (c) Explain difference between the data link and network layers of the OSI reference model layers (6mks)
- (a) For each of the following protocols, write their names in full, outline their functions and state the OSI reference model layer they operate
 - i. ICMP
 - ii. FTP
 - iii. HTTP(9mks)

QUESTION FIVE (20 MARKS) ELECTIVE

- (a) What is the importance of MODEMs in communications? (2mks)
- (b) MODEMs come in various forms and operate and wide speed ranges. Discuss external and internal modems giving at least one advantage and one disadvantage of each. (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 a binary digit 0 as compressions and a binary digit 1 as rarefactions. Sketch an analog signal that results from the following digital signal (6mks)

