

KENYA METHODIST UNIVERSITY

FIRST TRIMESTER EXAMINATIONS, APRIL 2009

FACULTY : ARTS AND SCIENCES
DEPARTMENT : COMPUTER INFORMATION SYSTEMS
COURSE CODE : CISY 356
COURSE TITLE : TELECOMMUNICATION NETWORKS II
TIME : 2 HOURS

Instructions:

Answer ALL questions in Section A and any other TWO questions in Section B.

Section A (30 Marks)

- a) Discuss the use of the following tools in network management operations and support systems
- i). Documentation
 - ii). Topology Maps
 - iii). Change Log [6 Marks]
- b) Telecommunication Networks can be classified in several different ways. List and briefly discuss any TWO data networks within each of the classifications below.
- i). Network ownership
 - ii). Type of switching technology used [8 Marks]
- c) The task of a Network Designer is to develop an overall network design that meets the requirements of the users in a cost-effective manner. Briefly discuss the following types of Addressing.
- i). Hierarchical Addressing
 - ii). Flat Addressing [4 Marks]
- d) Differentiate between *Telegraph Networks*, *Telephone Networks* and the *Internet* using the following criteria
- i). Switching Approach
 - ii). Transmission System
 - iii). Addressing
 - iv). Routing [12

Marks]

Section B (40 Marks)

Question One (20 Marks)

- a) The three key Internet telecommunications applications are Voice over IP (VoIP), Video Teleconferencing, and Virtual Private Networks (VPNs). List and briefly explain the TWO general approaches to implementing VoIP technology in business. [6 Marks]
- b) Stations communicating in a Packet-Switched Network typically break up a message into packets and then send these packets one at a time through such a network. Using a neat diagram differentiate between the following routing approaches
- i). Datagram
 - ii). Virtual Circuit [6 Marks]
- c) Discuss the following Wide Area Network telecommunications networking Architectures.
- i). Integrated Services Digital Network (ISDN)
 - ii). T-Carrier Channels [8 Marks]

Question Two (20 Marks)

- a) For Frame Relay operation, a user is not connected directly to another user, but rather to a frame handler in the network. Using a neat sketch, where appropriate, discuss the following approaches for setting up Frame Relay Connections.
- i). Switched Access
 - ii). Integrated Access [8 Marks]
- b) A variety of traffic control functions have been defined to maintain the Quality of Service of ATM connections. Explain the difference between the following control functions.
- i). Network Resource Management
 - ii). Priority Control

- iii). Fast Resource Management [6 Marks]
- c) In the U.S., SONET is an ANSI standard for synchronous data transmission on optical media. Internationally, SONET's equivalent is the Synchronous Digital Hierarchy (SDH). Briefly explain the functionality of the following SONET Network Components.
 - i). Point-to-Point Terminal
 - ii). 1:N Protection Channel Sharing [6 Marks]

Question Three (20 Marks)

- a) Differentiate between the following types of delays that affect performance of a packet-switched network.
 - i). Propagation Delay
 - ii). Transmission Time
 - iii). Node Delay [6 Marks]
- b) Why is it necessary to use a network management operations support system on a telecommunications Network? [2 Marks]
- c) Cellular telephone uses microwave analog or digital signals to connect subscriber wireless mobile telephones to transmitter stations. Briefly discuss the following 2G wireless technologies.
 - i). Code Division Multiple Access (CDMA)
 - ii). Global System for Mobile Communications (GSM)
 - iii). Wireless Application Protocol (WAP)[12 Marks]