MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 113: INTRODUCTION TO NETWORKING

DATE: 30/8/2022   **TIME: 2.00-4.00 PM**

INSTRUCTIONS:

Answer Question One and Any Other Two Questions.

QUESTION ONE (30 MARKS)

a)   Draw the OSI model and state **(precisely)** the role of each layer.   (5 marks)

b)   Differentiate between the following terms:

    i.   Packet switching vs. circuit switching.

    ii.   Peer to peer network vs. client server network.

    iii. Multicast routing vs. anycast routing.   (3 marks)

c)   State three differences between TCP and UDP   (3 marks)

d)   Describe the role of ports in networking and state any three known port numbers (3 marks)

e)   State the three types of automatic repeat request   (3 marks)

f)   Describe the following network devices

    i.   Hub

    ii.   Bridge

    iii. Router

g)   State and explain three major classifications of routing protocols.   (3 marks)

h)   State and explain three major classifications of media access control (MAC) protocols. Give

    examples under each classification   (6 marks)

QUESTION TWO

a)   Discuss the role of transport layer of the OSI model. Use diagram for illustration. (4 marks)

b)   Draw a diagram comparing the TCP/IP model and the OSI model.   (3 marks)

c)   State two protocols found at the following layers of the OSI model

   i.   Transport layer

   ii.   Data link layer

   iii. Application layer   (3 marks)

d)   Write short notes on the following LAN technologies.

   i.   Token ring

   ii.   FDDI   (6 marks)

e)   Differentiate between logical link control and MAC layers of the data link layer. (4 marks)

QUESTION THREE

a)   Write short notes on the following

   i.   Wireless LAN

   ii.   Bluetooth

   iii. RFID   (6 marks)

b)   Define the term flow control and discuss two flow control protocols   (6 marks)

c)   Discuss the following MAC protocols

   i.   Slotted aloha

   ii.   TDMA

   iii. Token passing   (6 marks)

d)   State and explain two types of errors in networking   (2 marks)

QUESTION FOUR

a)   Briefly describe the operation of a VLAn and state any three benefits of a VLAN (5 marks)

b)   Explain any three features of IPv6   (6 marks)

c)   Define the term classless interdomain routing (CIDR) and explain its significance.(3 marks)

d)   State any three special IPv4 addresses   (3 marks)

e)   Briefly describe the TCP three way handshake (connection establishment).   (3 marks)

QUESTION FIVE

a) Briefly describe the following:

    i.   HTTP

    ii.   DNS   (6 marks)

b) Explain any four threats to Machakos University network.   (8 marks)

c) Write short notes on the following:

    i.   Virtual private network

    ii.   Firewall

    iii.   Intrusion detection system   (6 marks)