KOLEJ UNIVERSITI POLY-TECH MARA KUALA LUMPUR

FINAL EXAMINATION

COURSE	**:**	**DATA COMMUNICATION CONCEPTS**
COURSE CODE	**:**	**TNW2033**
DURATION	**:**	**2 HOURS**

INSTRUCTIONS TO CANDIDATES :

1. This question paper consists of **SIX (6)** questions.
2. Answer **ALL** questions in the Answer Booklet provided. The mark for each question is explicitly indicated.
3. Do not bring any material into the examination hall unless permission is given by the invigilator.
4. Please write your answer using permanent ink**.**

MYKAD/

PASSPORT NO : _____

ID. NO. : _____

LECTURER : _____

SECTION : _____

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

The question paper consists of 5 printed pages including front page

QUESTION 1

a. Describe **THREE (3)** criteria of an effective and efficient network.

(6 Marks)

b.

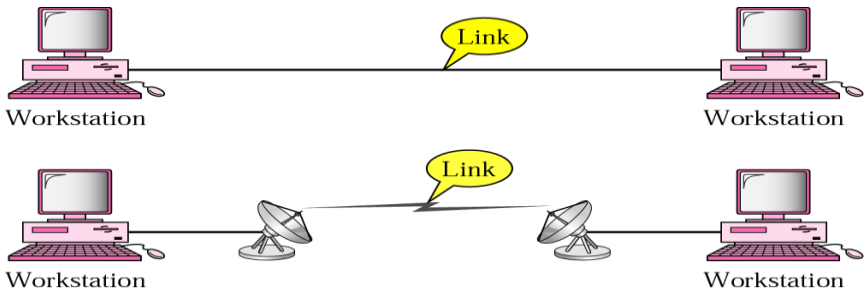


Figure 1: Network Configuration

i. Identify what type of configuration shown in the above figure.

(1 Mark)

ii. Summarize an advantage for the above configuration.

(2 Marks)

c.

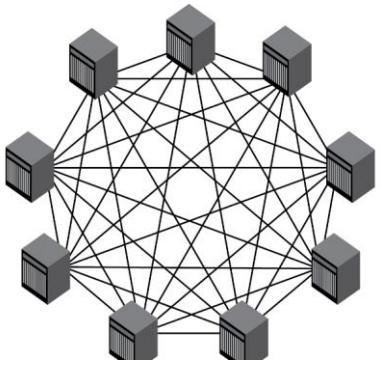


Figure 2: Network Topology

i. Calculate the number of cables needed for the figure above.

(4 Marks)

ii. Calculate the number of port needed by each device.

(2 Marks)

(Total : 15 Marks)

QUESTION 2

a. Define **TWO (2)** categories of transmission medium and give an example for each of the category.

(6 Marks)

b. Differentiate between twisted-pair cable and fiber-optic cable.

(4 Marks)

c. Name **FIVE (5)** layers function of TCP/IP protocol suite.

(5 Marks)

(Total : 15 Marks)

QUESTION 3

a. Define Analog and Digital signals and give **ONE (1)** example for each of the signal.

(4 Marks)

b. Draw a sine wave with the following characteristics: Frequency of 8Hz, Amplitude 5v and Phase 0 degree in Frequency-domain plot.

(6 Marks)

c. If a periodic signal is decomposed into four sine waves with frequencies of 100, 300, 500, and 700 Hz, what is the bandwidth in KHz? Draw the spectrum, assuming all components have a maximum amplitude of 10 V.

(5 Marks)

(Total : 15 Marks)

QUESTION 4

a. Differentiate between serial and parallel transmission.

(4 Marks)

b. Encode the bit stream 10101110 using:

i. Unipolar

ii. Differential Manchester

(16 Marks)

(Total : 20 marks)

QUESTION 5

a. Draw a diagram to show how frames are retransmitted if ***Selective Reject ARQ*** is used for damaged frame.

i. The sender sends 4 frames to the receiver.
ii. There is an error in f2.
iii. The receiver sends a negative acknowledgement to the sender.

(5 Marks)

b. Identify **FOUR (4)** LAN architectures.

(4 Marks)

c. Consider Alice wants to send some data to Charles. If the movement of data happens in clockwise, summarize how data moves from sender to receiver.

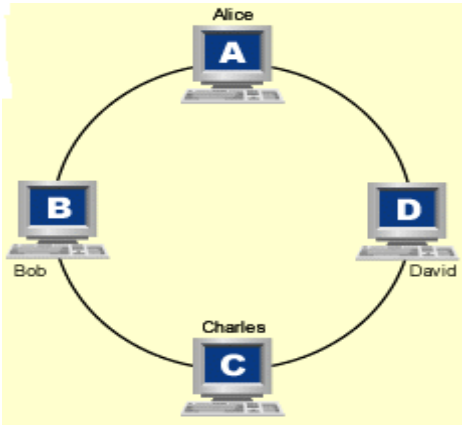


Figure 3: Token Passing Ring Network

(6 marks)

(Total : 15 marks)

QUESTION 6

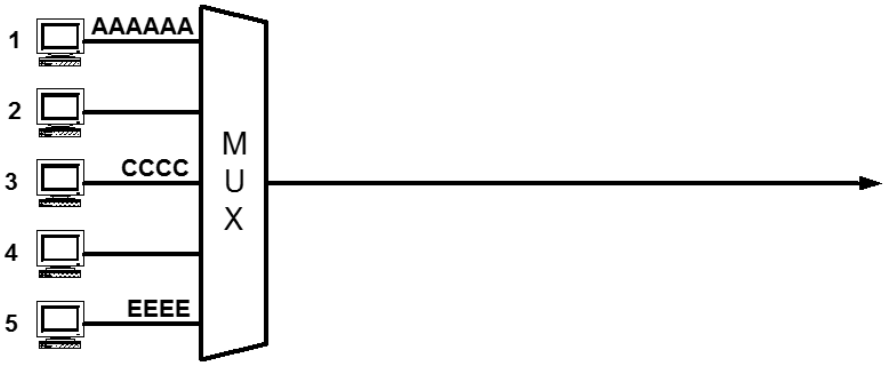
a. Describe what Multiplexing means.

(3 marks)

b. Given the following information, find the minimum bandwidth for the path:
FDM Multiplexing
4 devices, each requiring 2000 Hz
100 Hz guard band for each device

(4 marks)

c. Draw the complete asynchronous TDM frames at the output line showing the character data, given the following information: (Frame size = 3)



(8 marks)

(Total : 15 Marks)

(TOTAL : 100 MARKS)

END OF QUESTION PAPER