TELECOM

SECTION A: ATTEMPT ALL QUESTIONS.   **/55 Marks**

01.   What are the benefits of telecommunication?   **/2 Marks**
02.   Give any three (3) examples of Communication techniques.   **/3 Marks**

03.   What are difference between baseband and broadband transmission?   **/4 Marks**

04.   List three Basic elements of telecommunication devices .   **/3 Marks**

05.   Match column A with column B. write each letter corresponding to the correct answer in the
blank space provided.   **/5 Marks**

Column A	Column B	Answer
A. Hub	1. networking hardware that connects devices on a computer network by using packet switching to receive and forward data to the destination .	1:
B. Switch	2. is a node that broadcasts data to every computer or Ethernet-based device connected to it.	2:
C. Router	3. is a computer networking device that creates a single, aggregate network from multiple communication networks or network segments.	3:
D. Access point	4. is a device that connects two or more packet-switched networks or sub networks.	4:
E. Repeater	5. is a network node used in telecommunications that connects two networks with different transmission protocols together.	5:
F. Bridge		
G. Gateways		

06.   Compare the following terms: **/2 Marks**
      A.   Modulate
      B.   demodulate

07.   What are the three different types of telecommunication systems?   **/3 Marks**

08. List out any three (3) Applications of telecommunication in our daily life. **/3 Marks**

09. Give at least four (4) advantages of using Multiplexing. **/4 Marks**

10. Differentiate amplitude modulation from frequency modulation ? **/4 Marks**

11. Explain the different types of transmission media used for telecommunication, and can you provide some basic information about their characteristics? **/4 Marks**

12. Convert the following decimal numbers to hexadecimal. **/2 Marks**
    A. 3122=.....................................

13. Convert the following decimal numbers to binary. **/2 Marks**
    A. 35682=.....................................

14. In what situations would guided media such as copper wire or fiber-optic cable be preferred over unguided media such as microwave or infrared transmission, and vice versa? **/3 Marks**

15. Match column A with column B. write each letter corresponding to the correct answer in the blank space provided. **/5 Marks**

Column A	Column B	Answer
1. RFID	A. is a networking hardware device that allows other WiFi devices to connect to a wired network.	1:
2. *A radio communication system*	B. is a wireless technology standard for exchanging data over short distances using short-wavelength UHF (ultra-high frequency) radio waves	2:
3. Wireless access point	C. is uses electromagnetic fields to automatically identify and track tags attached to objects.	3:
4. Bluetooth	D. is a special computer designed for technical or scientific applications.	4:
5. A workstation	E. information is carried across space using *radio* waves.	5:
	F. is technology that enables sending data over existing power cables	6:

16. Calculate the following binary numbers **/4 Marks**
    i. $111100011_2 * 1110_2 =$
    ii. $11110001110_2 : 1100_2 =$
    iii. $11110001_2 + 11100011_2 =$
    iv. $1100_2 - 1010_2 =$

17.   Circle the letter corresponding with correct answer.   **/2 Marks**
       i.   Which is the process of combining the low- frequency signal (also called
             modulating signal) with a very high-frequency radio wave (also called carrier
             wave).
             a)Modulation
             b)Demodulation
             c)Encryption
             d)Decryption
       ii.   Which is the process of separating or recovering the signal from the modulated
             carrier wave.
             a)   Amplitude modulation
             b)   Frequency modulation
             c)   Demodulation
             d)   None of above

       SECTION B : ATTEMPT ANY THREE (3) QUESTIONS.   **/30MKS**

18.   Construct and explain in details how the following logic gates function by Using truth   **/10Marks**
       tables.
       A) XOR gate   **/2Marks**

       B) NOT gate   **/2Marks**

       C) NAND gate   **/2Marks**

       D) AND gate   **/2Marks**

       E) OR gate   **/2Marks**

19.   A. Demonstrate that   **/10Marks**
       (a+b)(a+b')=a   **/5Marks**

       B. Proof that if both sides are equal (R.H.S. = L.H.S.)

        (A+B)(B+C)(A'+C) = (A+B)(A'+C)   **/5Marks**

20.   Can you identify and explain the basic components of a telecommunications network.   **/10 Marks**

21.   How would you compare and evaluate the main techniques of multiplexing, such as   **/10Marks**
       frequency-division multiplexing (FDM), time-division multiplexing (TDM), wavelength-division
       multiplexing (WDM), and code-division multiplexing (CDM).Specifically, how might you assess
       advantages, and disadvantages of each technique in different scenarios, and make
       recommendations based on your analysis?
22.   How can the use of simplex, half duplex, and full duplex in telecommunications be analyzed to   **/10 Marks**
       evaluate their performance in terms of speed, reliability, cost, and security?

       SECTION C : ATTEMPT ONLY ONE (1) QUESTION.   **/15Marks**

23.   Design the logic diagram and construct the truth table corresponding to the following Boolean   **/15Marks**
       expressions without simplifying them:

$$Q = \overline{\overline{A+BC} + \overline{\overline{AB}}}$$

/7.5 marks

F=

$$A B \overline{C} + \overline{A} B D + \overline{B} \overline{C} D$$

/7.5 marks

24. After Interpret the below logic diagrams answer the following questions.   **/15Marks**
    I.   What are the different types of gates found in diagrams, and what are their specific names?   **/5 marks**
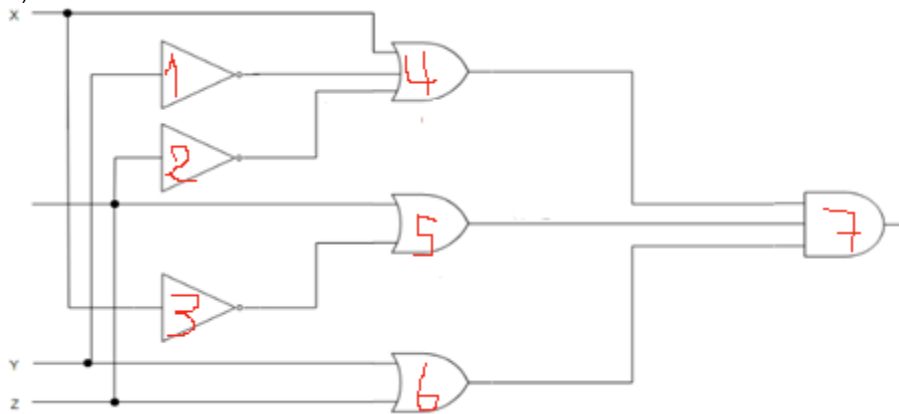   II.   write Boolean expression of each diagram   **/5 Marks**
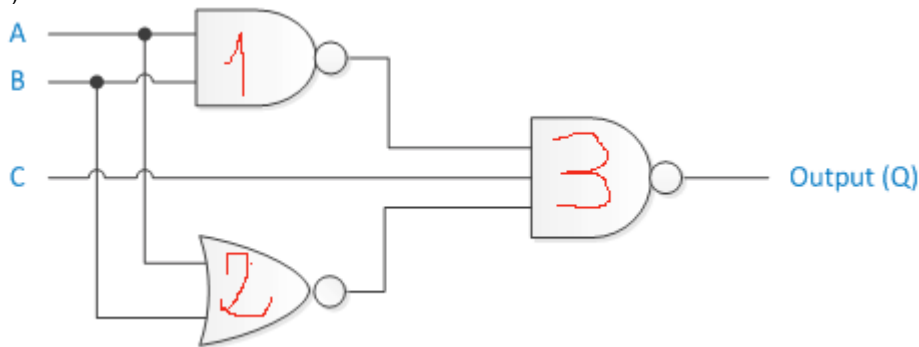   III.   Construct the truth tables of each diagram   **/5 Marks**

A)

B)

GOOD LUCK!

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