ICT 2156_Principles of Data Communication_29_01_2022

III SEMESTER B.TECH (IT/CCE) Date:29/01/2022

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1

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5
The number of shift registers required to calculate FCS using the pattern, (x + 1) (x^15 + x^14 + x^13 + x^12 + x^4 + x^3 + x^2 + x + 1) is (1 Point)
☐ 15
◯ 16
○ 1
0 17

A ______ error means that two or more bits in the data unit have changed. (1 Point)

more than 2 bit error can not occur

) single-bit

) double-bit

) burst

7

The signal loses strength due to the different propagation speeds of each frequency that makes up the signal. This is a type ______ of transmission impairment. (1 Point)

\bigcirc	Distortion
\bigcirc	Attenuation

) Noise

) Decibel

A signal is measured at two different points. The power is P1 at the first point and P2 at the second point. The dB is 0. This means _____. (1 Point)





P2 is zero

9

If the bandwidth of a signal is 5 KHz and the lowest frequency is 42 KHz, what is the highest frequency? (1 Point)

57 KHz
 5 KHz
 10 KHz
 47 KHz

______ type of data transmission uses a clock to control the timing of bit sent. (1 Point)

- Asynchronous Transmission
-) Synchronous Transmission
- Both Synchronous and Asynchronous Transmission.
- Clock is not used in any type of transmission

11

Consider the following 4 statements. Which of the statement(s) is/are are false?

A) In CSMA/CD, once the entire frame is sent, the station does not keep a copy of the frame and does not monitor the line for collision detection.

B) The maximum throughput in CSMA/CD is based solely on the persistence method and not on any other parameter (irrespective of whichever persistence method is used).

C) For non-persistent method, the maximum throughput can go up to 90 percent when G is 1.

D) The select function in Polling method is used whenever the primary device has something to send.(1 Point)

B and C are false.

A and D are false.

A and B are false.

) Only B is false.

Suppose a message of 10 MB is divided into blocks of 1000 Bytes each. All the layers at the OSI model add a 20-Byte header each. Trailer size is10 Bytes. If the message is to be sent using a point-to-point link, what is the user throughput if the link capacity is 50 Mbps? (1 Point)

|--|

) 11.5 Kbps

) 43.47 Kbps

) 43.47 Mbps

13

A network transmits 500 bits frame on a shared media of 256 Kbps. Assume that the systems in the network generate 500 frames per second. Calculate the network throughput for pure ALOHA. (1 Point)

- 0.135
- 0.368

0.367

0.138

We can send a maximum of 240 kbps over a noiseless channel with a bandwidth of 20 KHz. How many signal levels do we need? (1 Point)

15

The power of a signal is 10 mW and the power of the noise is 1 μ W. The value of SNRdB is _____? (1 Point)

- ─ 40
- 4
- 30
-) 10

Consider the following 2 statements. Which of the statement(s) is/are true?

A) The probability that a frame arrives with no bit errors decreases when the probability of a single bit error increases, assuming bit error rate is constant and independent of each bit.

B) The probability that a frame arrives with no bit errors increases with increasing frame length, assuming bit error rate is constant and independent of each bit.

C) Forward Error Correction is preferable in satellite communications as compared to retransmission owing to the high values of propagation delay. (1 Point)



- Only C is true.
- Only B is true.
- Only A is true.



\bigcirc \triangle and R :	are true
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17

The pattern P used in CRC calculation is best chosen depending on _____. (1 Point)

-) solely on the number of bits present in the data word to be communicated.
-) the type of error we may have to deal with.
-) the implementation method used for calculation of FCS.
-) the bit rate of the channel.

If the sum calculated for the message is all 1s, the internet checksum to be sent to the receiver will be_____. (1 Point)

All 1s

) All Os



) Checksum is not computed.

19

Given a dataword length of size 2 and a codeword size of 5, how many errors can always be detected and corrected? Consider t=1. (1 Point)

1-bit error always detected,1-bit error always corrected.

2-bit error always detected,1-bit error always corrected.

) 1-bit error always detected,2-bit error always corrected.

) 2-bit error always detected,2-bit error always corrected.

An isotropic antenna is a point in space:

- a. That radiates power in all directions equally.
- b. That radiates power only in one direction.
- c. Actual radiation pattern is a sphere with the antenna at the center.

d. Actual radiation pattern is not a sphere with the antenna at the center. (1 Point)

-

a and d are correct

a and c are correct

) b and d are correct

) b and c are correct

21

A telephone line is known to have a loss of 30 dB. The input signal power is measured as 0.5 W, and the output noise level is measured as 2.5μ W. Using this information, calculate the output signal-to-noise ratio in dB (1 Point)

23.99 dB

26.59 dB

23.01 dB

26.99 dB

Determine the height of an antenna for a TV station that must be able to reach customers up to 120 km away. (1 Point)

847.40 m

) 846.66 m

) 876.66 m

) 866.66 m

23

Assume that a telephone line channel is equalized to allow bandpass data transmission over a frequency range of 600 to 3000 Hz. The available bandwidth is 2400 Hz. For r=1, evaluate the required bandwidth for 2400 bps QPSK. (1 Point)

2400Hz2600Hz

) 1200Hz

) 3200Hz

For a parabolic reflective antenna with a diameter of 2 m, operating at 10 GHz, what is the antenna gain? (1 Point)

\bigcirc	43.88 dB
\bigcirc	39.88 dB
\bigcirc	43.44 dB
\bigcirc	39.44 dB

25

One positive side effect of bipolar encoding is that a bipolar violation (two consecutive + pulses or two consecutive - pulses separated by any number of zeros) indicates to the receiver that an error has occurred in transmission. Unfortunately, upon the receipt of such a violation, the receiver does not know which bit is in error (only that an error has occurred). For the received bipolar sequence + - 0 + - 0 - + which has one bipolar violation, construct three scenarios (each of which involves a different transmitted bit stream with one transmitted bit being converted via an error) that will produce this same received bit pattern.

a. + - 0 + - + - +b. + - 0 + 0 0 - +c. + - 0 + - 0 + d. + - 0 + - 0 0 +(1 Point)

a,b,d are correct
a,b,c are correct
c,d,a are correct

h c d are correct

A channel whose length is 150km, has a data rate of 5 Mbps and the velocity of propagation of the medium is 2×10^8 m/s. Calculate the bit length of the link. (1 Point)

\bigcirc	3750	bits	

- 3575 bits
-) 3850 bits
-) 3775 bits

27

A channel has a data rate of 4 kbps and the velocity of propagation of the medium is 2×10^{8} m/s. The distance of the link is 8000km. For what range of frame sizes does stop-and-wait give an efficiency of at least 50%? (1 Point)

- _____ =< 160
- >= 160
-) =< 320
- >= 320

Consider the use of 2000-bit frames on a 1-Mbps satellite channel with a 320ms delay. What is the maximum link utilization for Continuous flow control with a window size of 255? (1 Point)

\bigcirc	79%
\bigcirc	40%
\bigcirc	47%

76%

29

Bit stuffing is performed at the receiver and the data received at the receiver is **1111101111011011011011111000**. The original data pattern is: (1 Point)

- 111111111110110110111111000
- 11111011110111011011011111000
-) 11111111011101101101101111100
-) 111111111111011011001111100

For selective reject ARQ, each error generates a requirement to retransmit K frames and the value of K for W > = 2a+1 is (1 Point)

\bigcirc	2a + 1	
\bigcirc	W	
\bigcirc	2a	
\bigcirc	W+1	

31

In a FDM system, 10 channels are multiplexed: Each channel having a BW of 50KHz. If the guard Band between the channels are 1KHz, the minimum bandwidth required for transmission is: (1 Point)

\bigcirc	510KHz
\bigcirc	500KHz
\bigcirc	505KHz
_	

509KHz

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Which of the following options give the data sequence that is encoded using Manchester encoding represented in the figure. (1 Point)



33

What would be the minimum bandwidth of Manchester and differential Manchester? (1 Point)

4 times that of NRZ

) 4 times that of RZ

8 times that of RZ

) 2 times that of NRZ

Which of the signals from the given list use differential encoding? (1 Point)

Bipolar-AMI



-) NRZI
-) NRZ-L

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