

<p>Philadelphia University Faculty of Engineering Department of Computer Engineering</p>		<p>Date:- 03/04/2016 Allowed time:- 50 Minutes</p>
<p>Computer Network (630411,650522)</p>		<p>First Exam</p>
<p>Student Name: - ID: -</p>		

Question 1: Mark the following statements as **True** or **False**. 5 Points

UDP protocol does not guarantee delivery of Data. **True**

Guided media includes atmosphere, space, water. **False**

In Differential Manchester the Mid-bit transition is for clocking only. **True**

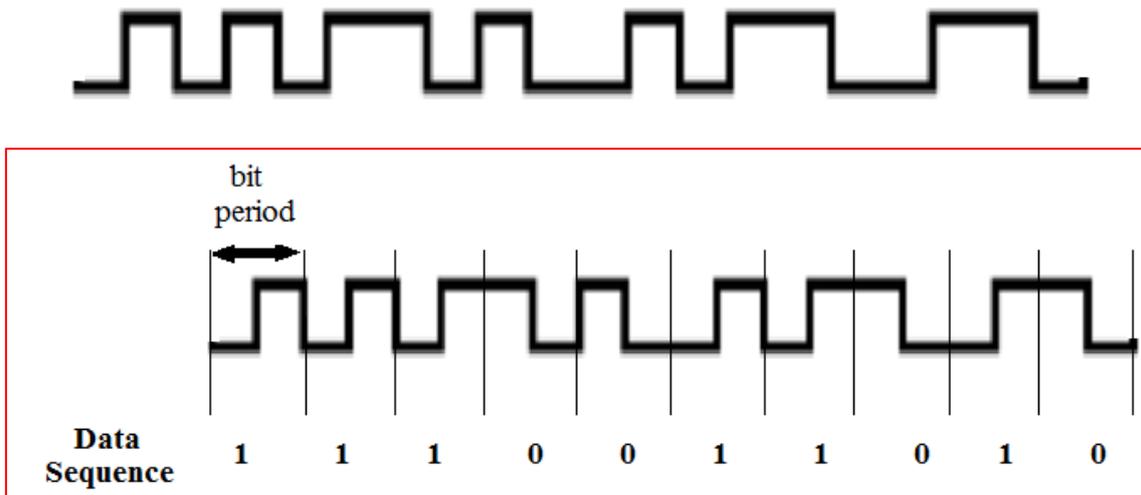
Selective reject ARQ retransmit the damaged frame and all subsequent frame. **False**

The Address field in HDLC protocol is only 8 bit long. **False**

Question 2: In computer networks two levels of addressing are needed list and describe them. 2 Points

- each computer on the network has a unique network address that distinguish that computer on the network
- each application has an address that is unique with that computer (SAPs)

Question 4: The following waveform represent Manchester encoding. Determine the beginning and end of each bit period and give the data sequence. 3 Points



Question 5: Describe the scrambling techniques used by B8ZS encoding technique. 2 Points

scrambling is used to replace sequences that would produce constant voltage (sequence of Zeros or Ones)

in B8ZS every sequence of 8 Zeros is replaces as the following.

- If an octet of all zeros occurs and the last voltage pulse preceding this octet was positive, then the eight zeros of the octet are encoded as 000+−0−+.
- If an octet of all zeros occurs and the last voltage pulse preceding this octet was negative, then the eight zeros of the octet are encoded as 000−+0+−.

Question 6: Describe the Cyclic Redundancy Check method used to detect error in transmission of data 2 Points

- for block of k bits transmitter generates an n bit frame check sequence (FCS)
- transmits $k+n$ bits which is exactly divisible by some number
- receiver divides frame by that number
 - if no remainder, assume no error
 - if there is a remainder, assume there is an error

Question 7: Two neighboring nodes (A and B) use a sliding window protocol with 3 bit sequence number. With ARQ mechanism go-back-N is used with window size of 4. Assume A is transmitting to B show the window position for both nodes when the following events occur. 3 Points

- 1- Before A send any frame.
- 2- After A send frames 0,1,2 and receives acknowledgement from B for 0 and 1
- 3- After A sends frames 3,4,5 and B acknowledges 4 and the acknowledgment received by A.

For both nodes.

A	0	1	2	3	4	5	6	7	0	1	2	Window size = 4
B	0	1	2	3	4	5	6	7	0	1	2	Window size = 3
C	0	1	2	3	4	5	6	7	0	1	2	Window size = 3

Question 8: In HDLC protocol explain the bit stuffing techniques and explain why it is needed. 3 Points

- delimit frame at both ends with 01111110 sequence
- receiver hunts for flag sequence to synchronize
- bit stuffing used to avoid confusion with data containing flag sequence 01111110
 - 0 inserted after every sequence of five 1s
 - if receiver detects five 1s it checks next bit
 - if next bit is 0, it is deleted (was stuffed bit)
 - if next bit is 1 and seventh bit is 0, accept as flag
 - if sixth and seventh bits 1, sender is indicating abort

Good Luck

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