


<p align="center">Philadelphia University Faculty of Engineering Department of Computer Engineering</p>		<p align="right">Date:- 03/04/2016 Allowed time:- 50 Minutes</p>
<p align="center">Computer Network (630411,650522)</p>		<p align="right">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.

Guided media includes atmosphere, space, water.

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

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

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

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

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

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

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.

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