


<p>Philadelphia University Faculty of Engineering Department of Computer Engineering</p>		<p>Date:- 28/01/2018 Allowed time:- 2 Hours Number of Pages: 5</p>
<p>Computer Network (630411,650522)</p>		<p>Final Exam</p>
<p>Student Name: - .....</p>		<p>ID: - .....</p>

**Question 1:** choose the correct answer for the following questions. **12 points**

1- Which of the following encoding has a transition at the middle of each bit.

- A) RZ      B) Manchester      C)  Differential Manchester      D) All the above

2- which cables are composed of a glass or plastic inner core surrounded by cladding, all encased in an outside jacket.

- A) Coaxial      B)  Fiber-optic      C) Twisted-pair      D) none of the above

3- In \_\_\_\_\_ error correction, the receiver corrects errors without requesting retransmission.

- A) backward      B) onward      C)  forward      D) none of the above

4- In Go-Back-N ARQ, if frames 4, 5, and 6 are received successfully, the receiver may send an ACK \_\_\_\_\_ to the sender.

- A) 5      B) 6      C) 7      D)  any of the above

5- Bit stuffing means adding an extra 0 to the data section of the frame when there is a sequence of bits with the same pattern as the \_\_\_\_\_.

- A) header      B) trailer      C)  flag      D) none of the above

6- In HDLC protocol which mode, the configuration is balanced, and each station can function as a primary and a secondary.

- A)  ABM      B) NRM      C) ARM      D) NBM

7- Which Ethernet standard uses thin coaxial cable.

- A) 10Base5      B)  10Base2      C) 10Base-T      D) 10Base-F

8- In IEEE 802.11, communication between two stations in two different BSSs usually occurs through \_\_\_\_\_

- A) BSSs      B) ESSs      C) APs      D)  DS

9- An IPv6 address consists of \_\_\_\_\_ bits.

- A) 32      B) 64      C)  128      D) 256

10- The number of host addresses in a class C IPv4 Addresses is \_\_\_\_\_.

- A) 65,536      B) 16,777,216      C)  254      D) none of the above

11- UDP is called a \_\_\_\_\_ transport protocol.

- A) connectionless, reliable      B) connection-oriented, unreliable  
C)  connectionless, unreliable      D) none of the above

12- TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is the number of the \_\_\_\_\_ byte carried in that segment.

- A)  first      B) last      C) middle      D) none of the above

**Question 2:** Given the following network IP address; divide the network to 4 sub networks. Show the network mask, IP and broadcast addresses to each subnetwork

**5 points**

192.168.0.0

$2^2=4$  number of bits taken from host part is 2

The network mask is 255.255.255.192

#	Network Address	Broadcast Address
1	192.168.0.0	192.168.0.63
2	192.168.0.64	192.168.0.127
3	192.168.0.128	192.168.0.191
4	192.168.0.192	192.168.0.255

**Question 3:** Given the following data use complement addition to calculate the checksum value where the checksum field is 16 bit long.

**5 points**

36EA F305 AC63 6570 524A

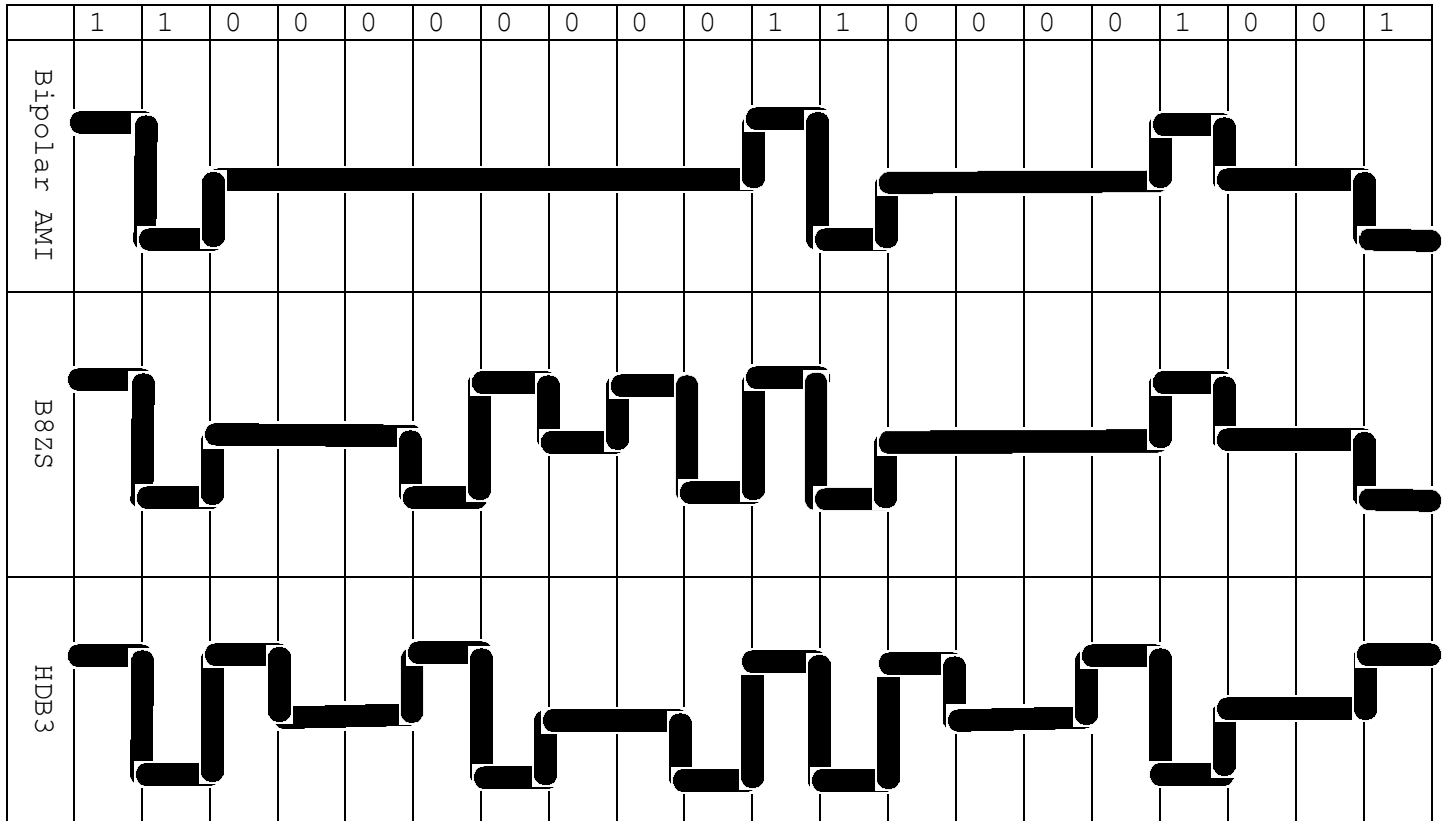
36EA	D653		
+ F305	+ 6570		
-----	-----		
1 29EF	1 3BC3		
29EF	3BC3		
+ 1	+ 1		
-----	-----		
29F0	3BC4		
29F0	3BC4		
+ AC63	+ 524A		
-----	-----		
D653	8E0E		
8	E	0	E
1000	1110	0000	1110
0111	0001	1111	0001
7	1	F	1

Question 4: Given the following string of bits

6 points

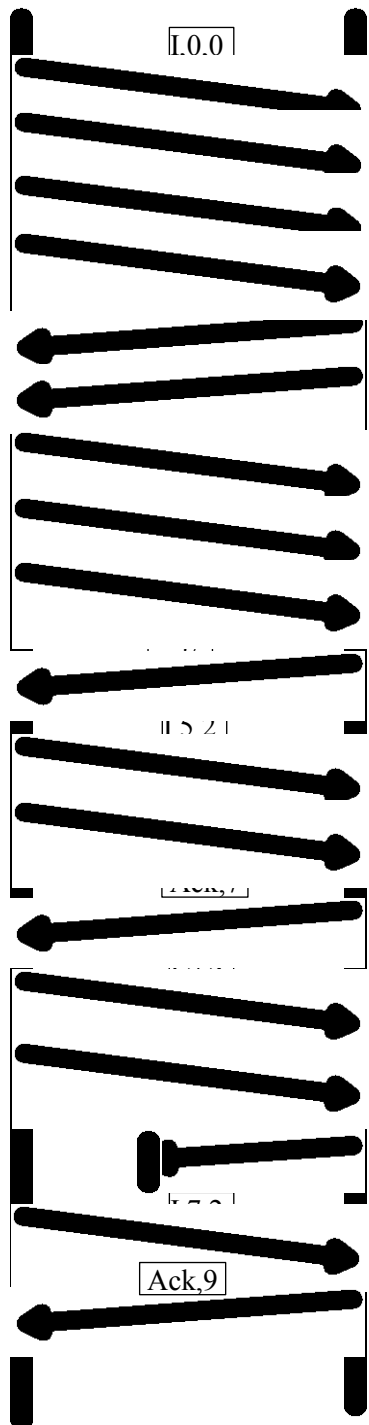
1 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 1 0 0 1

- 1- draw the wave form using bipolar AMI
- 2- draw the wave form for bipolar AMI using B8ZS substitution.
- 3- draw the wave form for bipolar AMI using HDB3 substitution (Assume even number of 1's since last substitution).



**Question 5:** Two neighboring nodes (A and B) use HDLC protocol with 4 bit sequence number. With ARQ mechanism go-back-N . draw a diagram that show the messages exchanged between A and B when the following events occur (show the types of message with N(S) and N(R )). **5 points**

- 1- A send messages 0,1,2,3 and B receives them successfully
- 2- B send messages 0,1 to A and A receive them successfully.
- 3- A send messages 4,5,6 to B and B receive 4,6 successfully and receive 5 with error.
- 4- After resolve error message in the previous statement A send messages 7,8 and B receive them successfully.
- 5- B send acknowledgement for message 8 but the acknowledgement lost.



**Question 6:** Explain how Checksum field in TCP header is computed. **2 points**

The Checksum field applies to the entire segment plus a pseudoheader prefixed to the header at the time of calculation (at both transmission and reception). The pseudoheader includes the following fields from the IP header: source and destination internet address and protocol, plus a segment length field. By including the pseudoheader, TCP protects itself from misdelivery by IP. That is, if IP delivers a packet to the wrong host, even if the packet contains no bit errors, the receiving TCP entity will detect the delivery error.

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**Question 7:** What are the differences between layer 2 switch and bridge. **3 points**

<b>Bridge</b>	<b>Switch</b>
Frame handling done in software	Performs frame forwarding in hardware
Analyzes and forwards one frame at a time	Can handle multiple frames at a time
Uses store-and-forward operation	Can have cut-through operation

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**Question 8:** How fragmentation process is performed in IPv6 protocol. **2 points**

Fragmentation only allowed at source

No fragmentation at intermediate routers

Node must perform path discovery to find smallest MTU of intermediate networks

Set source fragments to match MTU