



- (x) The key elements of a protocol are  
 (a) syntax, semantics & timing (b) syntax, semantics & Jitter  
 (c) delivery, semantics & timing (d) syntax, Accuracy & timing

*Fill in the blanks with the correct word*

- (xi) \_\_\_\_\_ refers to the meaning of each section of bits in a protocol.  
 (xii) The \_\_\_\_\_ product is a measure of the number of bits we can send out of our system while waiting for news from the receiver.  
 (xiii) A repeater is a connecting device that operates in the \_\_\_\_\_ layer of the network.  
 (xiv) Symmetric key cryptography is often used for \_\_ long \_\_\_\_ messages.  
 (xv) DNS was designed to have a \_\_\_\_\_ name space.

### Group - B

2. (a) Identify the five components of a data communication system. *[[CO1](Remember/LOCQ)]*  
 (b) A network uses a fully interconnected mesh topology to connect 10 nodes together in duplex mode. Calculate the number of links that will be required to connect the nodes. *[[CO2](Evaluate/HOCQ)]*  
 (c) Distinguish between LAN, MAN and WAN. *[[CO1](Analyze/IOCQ)]*  
**4 + 3 + 5 = 12**
3. (a) Discuss the responsibilities of the transport layer in the internet model. *[[CO2](Understand/LOCQ)]*  
 (b) Define encapsulation and decapsulation. *[[CO2](Remember/LOCQ)]*  
 (c) Differentiate between point to point and multipoint connection. *[[CO2](Analyse/IOCQ)]*  
**5 + 3 + 4 = 12**

### Group - C

4. (a) Evaluate the bandwidth-delay product in a Stop- and Wait ARQ if the bandwidth of the line is 1Mbps and 1 bit takes 40ms to take a round trip.? If the system data frames are 5000bits in length what is the utilization percentage of the link? Find the utilization percentage of the link if the link uses Go-Back-N ARQ with 5 frame sequence? *[[CO2](Evaluate/HOCQ)]*  
 (b) The maximum window size in Go-Back-N ARQ is  $2^m-1$ -Justify with proper diagram? *[[CO2](Apply/IOCQ)]*  
**6 + 6 = 12**
5. (a) Find the CRC bits for the data string 100100. The divisor is 1101. Show that the remainder is all zero at the receiver if the data bits are received correctly. *[[CO2](Evaluate/HOCQ)]*  
 (b) Draw the MAC frame for Ethernet with proper labelling. *[[CO2](Remember/LOCQ)]*  
 Identify the type of the following destination address:

- (i) 6E:43:10:21:1A:FF
- (ii) 3F:67:21:10:90:23
- (iii) FF:FF:FF:FF:FF:FF

[[CO2](Apply/IOCQ)]  
**6 + (3 + 3) = 12**

### Group - D

6. (a) Define socket address? [[CO4](Remember/LOCQ)]  
 (b) Identify the error if any in the following IPv4 addresses. [[CO4](Apply/IOCQ)]  
 (i) 111.56.045.78  
 (ii) 221.34.7.8.20  
 (iii) 75.45.301.14  
 (iv) 11001011.23.14.67  
 (c) Describe with proper explanation how socket address is represented in the transport layer. [[CO4](Understand/LOCQ)]
- 3 + 4 + 5 = 12**
7. (a) Distinguish between Unicast, Multicast and Reserved addresses. [[CO4](Analyse/HOCQ)]  
 (b) Identify the classes of each of these addresses with proper reasoning.  
 (i) 00110011 00001111 10110011 11001110  
 (ii) 11001100 01010101 00001111 11001111  
 (iii) 14.23.120.8  
 (iv) 252.5.15.111  
 (v) 192.26.18.103  
 (vi) 200.05.16.132 [[CO4](Apply/IOCQ)]

**6 + 6 = 12**

### Group - E

8. (a) Compare the architecture of BSS & ESS of a WLAN. [[CO6](Analyse/IOCQ)]  
 (b) Explain the No\_transition, BSS-Transition, ESS-Transition mobility in wireless LAN. [[CO6](Understand/LOCQ)]  
 (c) Design the two types of link that can be created between a master and a slave in Bluetooth technology. [[CO6](Design/HOCQ)]
- 4 + 4 + 4 = 12**
9. (a) Identify different types of keys in cryptography? Compare Symmetric Key & Asymmetric key cryptography. [[CO5](Analyse/IOCQ)]  
 (b) Classify the two types of network architecture of Bluetooth. [[CO5](Analyse/IOCQ)]  
 (c) Explain ESS in details with proper diagram. [[CO5](Understand/LOCQ)]

**(1 + 3) + 4 + 4 = 12**

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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	32.3	41.7	26

