

**COMPUTER NETWORKS**  
**(ECEN 3132)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group - A**  
**(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) In which topology there is a central controller or hub?  
(a) Star                      (b) Mesh                      (c) Ring                      (d) Bus.
  - (ii) The network layer concerns with  
(a) bits                                      (b) frames  
(c) packets                                      (d) none of the mentioned.
  - (iii) Error detection at the data link level is achieved by  
(a) bit stuffing                                      (b) cyclic redundancy codes  
(c) Hamming codes                                      (d) equalization.
  - (iv) The packet of information at the application layer is called \_\_\_\_\_  
(a) Packet                      (b) Message                      (c) Segment                      (d) Frame.
  - (v) Baud means  
(a) the number of bits transmitted per unit time  
(b) the number of bytes transmitted per unit time  
(c) the rate at which the signal changes  
(d) none of these.
  - (vi) Network addresses are very important concepts of  
(a) Routing                                      (b) Mask  
(c) IP Addressing                                      (d) Classless Addressing.

- (vii) User datagram protocol is called connectionless because  
(a) all UDP packets are treated independently by transport layer  
(b) it sends data as a stream of related packets  
(c) both (a) and (b)  
(d) none of the mentioned
- (viii) HDLC is  
(a) bit oriented (b) code transparent  
(c) code dependent (d) none of these.
- (ix) Which of these is not applicable for IP protocol?  
(a) Connectionless (b) Offer reliable service  
(c) Offer unreliable service (d) None of the mentioned.
- (x) What is data encryption standard (DES)?  
(a) block cipher (b) stream cipher  
(c) bit cipher (d) none of the mentioned

### Group - B

2. (a) What are the responsibilities of the network layer in the Internet model? How does information get passed from one layer to the next in the Internet model?
- (b) Distinguish between LAN and MAN. What is the difference between a port address, a logical address and a physical address?  
**(3 + 3) + (2 + 4) = 12**
3. (a) Differentiate between connectionless and connection-oriented services in Data networks.
- (b) A 4-bit data block 0111 is to be sent using the hamming code for error detection and correction. Show how the receiver corrects an error that occurs in 3<sup>rd</sup> bit position from the right.
- (c) How are ISO-OSI and TCP/IP models related to each other?  
**3 + 6 + 3 = 12**

### Group - C

4. (a) Explain the Parity checking Process in error detection with proper block diagram.
- (b) Explain the functionality of GO-Back-N ARQ for lost frame and lost Acknowledgement case.  
**6 + 6 = 12**

5. (a) What is byte-stuffing? Briefly explain the three protocols for noisy channels.
- (b) Explain the procedure of Pure ALOHA protocol.

**(1 + 4) + 7 = 12**

**Group - D**

6. (a) What are the differences between classful addressing and classless addressing in IPv4? List the classes in classful addressing and define the application of each class (unicast, multicast, broadcast, or reserve).
- (b) What is a mask in IPv4 addressing? What is a default mask in IPv4 addressing? Briefly define sub-netting. How does the subnet mask differ from a default mask in classful addressing?

**(2+3) + (2+1+2+2) = 12**

7. (a) Distinguish between open-loop and closed-loop congestion control. UDP is a message-oriented protocol. TCP is a byte-oriented protocol. If an application needs to protect the boundaries of its message, which protocol should be used, UDP or TCP?
- (b) How are congestion control and quality of service related?
- (c) Are both UDP and IP unreliable to the same degree? What is the minimum size of a UDP datagram?

**(4 + 2) + 3 + (2 + 1) = 12**

**Group - E**

8. (a) How does caching increase the efficiency of name resolution? What is URL and what are its components?
- (b) What are the two main categories of DNS messages? Explain the RSA algorithm with an example.

**(3 + 3) + (2 + 4) = 12**

9. Write short notes on any three of the following

- i) IEEE 802.11
- ii) Port Number
- iii) Token Bucket Algorithm
- iv) Point-to Point Protocol
- v) HDLC

**(4 × 3) = 12**

Department & Section	Submission Link
ECE	<a href="https://classroom.google.com/w/MTI1OTU5MjY5MjAw/tc/Mjc0NDA3NjI0NjcX">https://classroom.google.com/w/MTI1OTU5MjY5MjAw/tc/Mjc0NDA3NjI0NjcX</a>

