

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) Which topology requires a central controller or hub?
(a) Mesh (b) Star (c) Bus (d) Ring.
 - (ii) The process-to-process delivery of the entire message is the responsibility of which of the following layer?
(a) Network (b) Transport (c) Application (d) Physical.
 - (iii) The protocol which is responsible for terminating links within PPP stack is
(a) LCP (b) AP (c) NCP (d) IPCP.
 - (iv) The maximum number of frames in sender's sliding window in Go-Back-N ARQ is
(a) 2^m-1 (b) 2^m+1 (c) m^2-1 (d) $2m$.
 - (v) Which error detection method uses 1's complement arithmetic?
(a) Simple parity check (b) Checksum
(c) Two-dimensional parity check (d) CRC.
 - (vi) Which of the following requires one primary station and one or more secondary stations?
(a) Token ring (b) Reservation (c) Polling (d) CSMA.
 - (vii) An ARP reply is normally which of the following options?
(a) Broadcast (b) Multicast (c) Unicast (d) None of these.
 - (viii) The WWW today is which of the following client-server service, in which a client using a browser can access a service using a server?
(a) Limited (b) Vast (c) Distributed (d) None of the above.
 - (ix) Which one of the following task is not done by data link layer?
(a) Framing (b) Error control (c) Flow control (d) Channel coding.
 - (x) Hyper Text Transfer Protocol supports which of the following option?
(a) Proxy domain (b) Proxy documents (c) Proxy server (d) Proxy IP.

Group- B

2. (a) Compare between star topology and mesh topology. [(CO1,CO2)(Analyze/IOCQ)]
 (b) Discuss the performance criteria of the computer networks. [(CO1,CO2)(Understand/LOCQ)]
 (c) Define the type of connections in a computer network. [(CO1,CO2)(Remember/LOCQ)]
6 + 4 + 2 = 12
3. (a) Explain the functions of data link layer. [(CO2)(Remember/LOCQ)]
 (b) Compare the characteristics of TCP/IP model with OSI model. [(CO2)(Analyze/IOCQ)]
 (c) What is a datagram? [(CO2)(Remember/LOCQ)]
5 + 5 + 2 = 12

Group - C

4. (a) The parity check bits of a (7,4) block code are generated by
 $c_5 = d_1 \oplus d_2 \oplus d_4$
 $c_6 = d_1 \oplus d_3$
 $c_7 = d_1 \oplus d_3 \oplus d_4$
 (i) Construct the corresponding generator matrix.
 (ii) Find the systematic code corresponding to the information bits [1100] and [1010].
 (iii) If the received words are $V_1 = [1011001]$ and $V_2 = [1111011]$, find the correct code words. [(CO2)(Create, Evaluate/HOCQ)]
 (b) How does a single bit error differ from burst error? [(CO2)(Understand,Apply/LOCQ, IOCQ)]
(3 + 3 + 3) + 3 = 12
5. (a) Suppose the following block of 16 bits is to be sent using a checksum of 8 bits.
 10101001 00111001.
 Find the checksum at the sender site and also find the checksum at the receiver site, if there is no error. [(CO2)(Create, Evaluate/HOCQ)]
 (b) Discuss the performance limitations of the checksum method? [(CO2)(Understand/LOCQ)]
 (c) Explain the process of byte stuffing and un-stuffing in the data link layer? [(CO2)(Analyze, Evaluate/IOCQ,HOCQ)]
5 + 4 + 3 = 12

Group - D

6. (a) Compare Static routing with Dynamic routing. [(CO4)(Remember/LOCQ)]
 (b) Differentiate between Unicast and Multicast routing. [(CO4)(Remember/LOCQ)]
 (c) Explain the process of three way handshaking followed in TCP. [(CO4)(Remember/LOCQ)]
4 + 4 + 4 = 12

7. (a) Draw the user datagram format of a UDP. Mention some of its application.
[[CO4](Remember/LOCQ)]
- (b) Distinguish between the operations of a repeater, bridge and a hub.
[[CO3](Analyse/IOCQ)]
- (3 + 3) + 6 = 12

Group - E

8. (a) With the help of proper diagram, compare between symmetric-key and asymmetric-key cryptography?
[[CO5,CO6](Apply,Analyze/IOCQ)]
- (b) Explain how HTTP is similar to SMTP?
[[CO6](Evaluate/HOCQ)]
- (c) Name the common 3 components of a browser?
[[CO5](Remember/LOCQ)]
- 6 + 4 + 2 = 12
9. (a) Compare the architecture of BSS and ESS of a WLAN.
[[CO6](Analyse/IOCQ)]
- (b) Discuss 3 types of 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 + 3 + 5 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	41.67	31.25	27.08

Course Outcome (CO):

- After the completion of the course students will be able to
1. Understanding of the fundamental concepts of computer networking.
2. Apply the basic taxonomy and terminology of the computer networking area.
3. Identify the different types of network devices and their functions within a network.
4. Understand internetworking principles, routing principles and algorithms such as IP, IPv6, distance vector, and link state.
5. Conclude advanced networking concepts and advanced courses in computer networking.
6. Gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

