

- (c) Network Interface control sublayer
- (d) none of the above

- (vi) Which of the following is a valid host for a network 192.168.10.32/28?
 - (a) 192.168.10.14
 - (b) 192.168.10.54
 - (c) 192.168.10.39
 - (d) 192.168.10.47
- (vii) [000,011,111,101] is a set of valid code words. Find out d_{min} .
 - (a) 0
 - (b) 1
 - (c) 2
 - (d) 3.
- (viii) At which layer circuit switching takes place?
 - (a) Physical layer
 - (b) Data Link layer
 - (c) Network layer
 - (d) Transport layer.
- (ix) If you want to find the number of routers between a source and destination, the utility to be used is.
 - (a) ipconfig
 - (b) ping
 - (c) ifconfig
 - (d) traceroute.
- (x) Which of the following is not IPV6 address?
 - (a) Any Cast
 - (b) Multicast
 - (c) Unicast
 - (d) Broadcast.

Group - B

- 2. (a) Describe the classifications and propagation methods for unguided media.
- (b) A channel has a bandwidth of 1 MHz and a signal to noise ratio 63 dB. Determine appropriate bit rate and signal level.
- (c) Encode the bit sequence 1001011100 using NRZ-L, NRZ-I coding scheme.
What do you mean by wavelength division multiplexing.
4 + (2+2) + (2+2) = 12
- 3. (a) If our system wants to guarantee the detection of upto s errors, what should the minimum Hamming distance between valid code words be and why? In this context, also explain what is meant by data word and code word.
- (b) Let us denote a code word as a polynomial with binary coefficients of the form $c(x)$, error as $e(x)$ and the generator function as $g(x)$. How can the received code word be expressed using the above? Also, if I

want my system to detect all single bit errors, explain what should be a proper choice of $g(x)$ and why.

5 + 7 = 12

Group - C

- 4. (a) Find the expressions for average delay and throughput for both pure ALOHA and slotted ALOHA. Compare their performances as well.
- (b) "In Selective-Repeat ARQ, sender window size $> 2^{m-1}$." Is it correct? Justify.
- (c) Explain leaky bucket algorithm
3 + (3+2) + 4 = 12
- 5. (a) The sender has a sliding window size = 3. Go back and N protocol is used. Discuss the behaviour of the receiving sliding window under the following cases:
Case1 : Frame 2 is lost in transition
Case 2: Frame no. 2 is received by the receiver correctly but ACK is lost.
- (b) What are the problems of providing redundant path in a bridged network. How does a transparent bridge provide solution to this problem.
- (c) What do you mean by piggybacking?
(2+3) + (2+3) + 2 = 12

Group - D

- 6. (a) Router J has 4 neighbours A, I, H,K. The following list summerizes the various delay:

JA: 8	Jl:10	JH:12	JK:6
A to G: 18	I to G: 31	H to G: 6	K to G: 31

 Using distance vector routing protocol determine the routing table entry for J to the router G. Discuss the problem associated with the same and how this problem is solved.
- (b) Explain the principle of OSPF.
(4+2+3) + 3 = 12
- 7. (a) A router with IP address 125.45.23.12 and Ethernet physical address 23:45:AB:4F:67:CD has received a packet for a destination with IP

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address 125.11.78.10. and Ethernet physical address AA:BB:A2:4F:67:CD. Show the entries in the ARP request packet sent by the router. Encapsulate the ARP request packet in a data link frame. Fill in all the fields.

- (b) S opens a TCP connection with an initial sequence number (ISN) of 14535. Other party R opens the connection with an ISN of 21,732. Show the three TCP segments during the connection establishment.
8 + 4 = 12

Group - E

8. (a) Explain the concept of frequency reuse technique in the cellular structure.
(b) Explain CDMA techniques with an example. What is hidden station and exposed station problem in Wireless LAN.
3+ (5+4) = 12
9. (a) Why is Bluetooth referred to as an ad-hoc network?
(b) Explain the layered architecture of Bluetooth.
(c) What is piconet and scatternet?
2 + 6 + 4 = 12

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2016**

**ADVANCED COMPUTER NETWORKS
(CSEN 5203)**

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 alternatives for the following: **10 × 1=10**
- (i) The Hamming Distance $d(000,011)$ is
(a) 0 (b) 3 (c) 2 (d) 1.
- (ii) Interframe gap is?
(a) idle time between frames
(b) idle time between frame bits
(c) idle time between packets
(d) control frame between two data frames
- (iii) Which routing algorithm requires more traffic between routers for set up and updating?
(a) Distance Vector (b) Link State
(c) Dijkstra (d) Vector Link
- (iv) If there are N routers from source to destination, total end to end delay in sending packet P(L->number of bits in the packet R->transmission rate) is
(a) N (b) $(N*L)/R$ (c) $(2N*L)/R$ (d) L/R
- (v) Automatic repeat request error management mechanism is provided by
(a) Logical Link control sublayer
(b) Media access control sublayer