K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Exam
NOV-DEC 2021

Max. Marks: 50
Duration: 1 Hr. 45 Min.
Class: SY/TY/LY/B.Tech/M.Tech Semester: V
Name of the Course: Computer Networks Branch: Computer Engineering
Course Code: 2UCC502

Instructions:
(1) **All questions are compulsory**
(2) **Draw neat diagrams**
(3) **Assume suitable data if necessary**

Question No.		Max Marks
Q1 (A)	Answer the Following. Each question carries 1 mark. 1. To guarantee the correction of up to 2 bit errors, the minimum Hamming distance (*dmin*) in a block code must be _____ a. 2 b. 3 c. 4 d. 5 2. Which of the following layer/s of the OSI model is responsible for ensuring privacy of information? a. Data link layer b. Presentation layer c. Network layer d. Transport layer 3. What will be the first 8-bits (from MSB) in a provider-based unicast IPv6 address registered in Asia? a. 01011000 b. 01010100 c. 10010100 d. 01001000 4. The repeater-less maximum length of cable in 10Base-2 Ethernet implementation is limited to _____ a. 500 m b. 100 m c. 185 m d. 2000 m	10

5. Which of the following is the utility command that can be used to find the contents of a routing table for a host or router?

a. tracert
b. traceroute
c. netstat –r
d. ping

6. Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links.
[S1] The computational overhead in link state protocols is higher than in distance vector protocols.
[S2] A distance vector protocol (with split horizon) avoids persistent routing loops, but not a link state protocol.
[S3] After a topology change, a link state protocol will converge faster than a distance vector protocol.

Which one of the following is correct about statements S1, S2, and S3?
a. S1, S2, and S3 are all true
b. S1, S2, and S3 are all false.
c. S1 and S2 are true, but S3 is false
d. S1 and S3 are true, but S2 is false

7. In TCP what is the size of the window for host A if the value of *rwnd* is 3000 bytes and the value of *cwnd* is 3500 bytes?

a. 3000 bytes
b. 3500 bytes
c. 500 bytes
d. 6500 bytes

8. Consider an ARP scenario in which the sender is a router that has received a datagram destined for a host on another network. In this case, the logical address that must be mapped to a physical address is_____

a. Destination IP address in the datagram header
b. IP address of the next router
c. Both a and b
d. None of the above

9. An autonomous system (AS) that is source or sink for data traffic and has more than one connection to other ASs is called as:

a. Stub AS
b. Multi-homed AS
c. Transient AS
d. Virtual AS

10. State True or False. *www.somaiya.edu* is not a Fully Qualified Domain Name.

Q1 (B)	Attempt any FIVE questions out of the following (any 5 out of 7) 1. The destination address in an Ethernet frame is 6A:30:10: 21:11:1A. Show how this address is sent out on the line. 2. A pure ALOHA network has 100 stations. If the frame transmission time is 1 microseconds, what is the number of frame/s each station can send to achieve the maximum efficiency? 3. Sender-receiver pair separated by a distance of 3000 km uses Stop and wait ARQ protocol for communication. If each PDU carries 1000 bits of data, how much time it will take to send 10^6 bits of data? Assume propagation speed of $3*10^8$ m/s and no data or control frame is lost or damaged. Ignore all delays. 4. An organization is allocated a block of IP addresses. If one of the address in the block is 192.168.15.12/23. Calculate the first and last IP address of this block. 5. Is it possible for a source to dictate the route an IP datagram should follow as it travels through the network? Explain. 6. An IPv4 packet has arrived with the first few hexadecimal digits as shown. **0x45000028000100000101 . . .** How many hops can this packet travel before being dropped? The data belong to which upper-layer protocol? 7. In an IP based network, a router discards a datagram due to congestion. Which ICMP message the router will send to the sender of datagram? What will be its type value?	10
Q. 2	a. An IP datagram of size 4200 bytes is to be sent over an Ethernet LAN. Is it necessary to fragment this datagram? If yes, why? If all fragments carry equal number of bytes, give the fragmentation offset value for each fragment. Assume that bytes in the original datagram are numbered as 0 - 4199. **OR** a. Two hosts A and B are on the same Ethernet network. Host A with IP address 172.17.15.21 and physical address B2:34:55:10:22:10 has a packet to send to another host B with IP address 172.17.15.30 and physical address A4:6E: F4:59:83:AB (which is unknown to host A). Show with neat diagram, the ARP request and reply packets exchanged between them. b. Explain with the help of diagram the two node instability problem in Distance vector routing. Enlist the solutions proposed for resolving this instability. **OR** b. Explain with the help of neat diagram the Reverse Path Forwarding in DVMRP.	10 (5+5)
Q. 3	a. Explain with the help of neat diagram TCP segment format providing details of all fields. b. An UDP datagram is created to transport the text "SOMAIYA" over an IP based network. Let the source and destination port numbers be 1083 and 17 respectively. Assume the source and destination IP addresses are 172.17.15.4 and 153.18.8.105. Value of UDP total length field =15. Show with the help of neat diagram the contents of pseudoheader, header and data sections used in checksum calculation of this UDP datagram [Do not calculate the checksum].	10 (5+5)

Q. 4	Answer **any TWO** a. Explain with the help of diagram recursive name-address resolution mechanism in DNS b. Write short note on FTP c. Write short note on SCTP	10