KIIT Deemed to be University
Online End Semester Examination(Autumn Semester-2020)

Subject Name & Code: CN(IT-3005)
Applicable to Courses: B. Tech

Full Marks=50
Time:2 Hours

SECTION-A(Answer All Questions. Each question carries 2 Marks)

Time:30 Minutes
(7×2=14 Marks)

Question No	Question Type (MCQ/SAT)	Question	CO Mapping	Answer Key (For MCQ Questions only)
Q.No:1		Question -1 In HTTP, which of the following request method is used to update the existing resources at the server end. a) PUT b) POST c) PATCH d) TRACE	CO6	b
		Question -2 Which of the following methods does not have an entity body. a) PATCH b) DELETE c) GET d) POST	CO6	c
		Question -3 In which of the following methods the object requested is left out in the response message. a) TRACE b) OPTION c) HEAD d) PATCH	CO6	c
		Question -4 Which of the following is present in both an HTTP request line and a status	CO6	a

		line? a) HTTP version number b) URL c) Method d) None of the mentioned		
Q.No:2		Question -1 Calculate the transmission delay (in microseconds) for a packet of size 44bits over a link of 2mbps. a) 220 b) 22 c) 0.22 d) 2.2	CO1	b
		Question -2 In the transfer of file between server and client, if the transmission rates along the path is 10Mbps, 20Mbps, 30Mbps, 40Mbps. The throughput is usually _____. a) 20Mbps b) 10Mbps c) 40Mbps d) 50Mbps	CO1	b
		Question -3 Assume there is no congestion in a given network and the end-to-end delay is N*(processing delay + transmission delay + propagation delay) . Find the number of intermediate nodes present between the source and destination. a) N/2 b) N c) N-1 d) 2N	CO1	c
		Question -4 Let us assume a packet is now transmitted in a network where no packet transmission happens earlier, then which of the following delays could be zero? a) Propagation delay b) Queuing delay c) Transmission delay d) Processing delay	CO1	b
Q.No:3		Question -1	CO2	c

		The data send and recv in case of TCP is carried out as using _____ a) Sequence of characters b) Lines of data c) Stream of bytes d) Packets		
		Question -2 The value of acknowledgement field in a segment defines _____. a) sequence number of the byte received previously b) total number of bytes to receive c) sequence number of the next byte to be received d) sequence of zeros and ones	CO2	c
		Question -3 The receiver of the data controls the amount of data that are to be sent by the sender is referred to as _____. a) Flow control b) Error control c) Congestion control d) Error detection	CO2	a
		Question -4 In Three-Way Handshaking process, the situation where both the TCP's issue an active open is _____. a) Mutual open b) Mutual Close c) Simultaneous open d) Simultaneous close	CO2	c
Q.No:4		Question -1 In the slow start phase of the TCP congestion control algorithm, the size of the congestion window a) does not increase b) increases linearly c) increases quadratically d) increases exponentially	CO2	d
		Question -2 Which of the following system calls results in the sending of SYN packets? a) socket	CO2	d

		b) bind c) listen d) connect		
		Question -3 Generally TCP is reliable and UDP is not reliable. DNS which has to be reliable uses UDP because a) UDP is slower b) DNS servers has to keep connections c) DNS requests are generally very small and fit well within UDP segments d) None of these	CO2	c
		Question -4 Which of the following control fields in TCP header is used to specify whether the sender has no more data to transmit? a) FIN b) RST c) SYN d) PSH	CO2	a
Q.No:5		Question -1 Which of the following is false with respect to the datagram networks? a) Number of flows of packets are not limited b) Packets may not be in order at the destination c) Path is not reserved d) Delay is the same for all packets in a flow	CO4	d
		Question -2 The TTL field has value 10. How many routers (max) can process this datagram? a) 11 b) 9 c) 10 d) 1	CO4	c
		Question -3 If the value in protocol field is 17, the transport layer protocol used is _____. a) TCP b) UDP	CO4	b

		c) ICMP d) IGMP		
		Question -4 Which of this is not a class of IP address? a) Class E b) Class C c) Class D d) Class F	CO4	d
Q.No:6		Question -1 You have an IP address of 172.16.13.5 with a 255.255.255.128 subnet mask. What is your class of address, subnet address, and broadcast address? a) Class A, Subnet 172.16.13.0, Broadcast address 172.16.13.127 b) Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.127 c) Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.255 d) Class B, Subnet 172.16.0.0, Broadcast address 172.16.255.255	CO5	b
		Question -2 If you wanted to have 12 subnets with a Class C network ID, which subnet mask would you use? a) 255.255.255.252 b) 255.255.255.255 c) 255.255.255.240 d) 255.255.255.248	CO5	c
		Question -3 Your router has the following IP address on Etherneto: 172.16.2.1/23. Which of the following can be valid host IDs on the LAN interface attached to the router? i. 172.16.1.100 ii. 172.16.1.198 iii. 172.16.2.255 iv. 172.16.3.0 a) i only b) ii and iii only c) iii and iv only	CO5	c

		d) ii only		
		Question -4 What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask? a) 14 b) 32 c) 16 d) 30	CO5	d
Q.No:7		Question -1 Let G(x) be the generator polynomial used for CRC checking. What is the condition that should be satisfied by G(x) to detect odd number of bits in error? a) G(x) contains more than two terms b) G(x) does not divide 1+x^k, for any k not exceeding the frame length c) 1+x is a factor of G(x) d) G(x) has an odd number of terms.	CO3	c
		Question -2 Suppose the round trip propagation delay for a 10 Mbps Ethernet having 48-bit jamming signal is 46.4 ms. The minimum frame size is a) 94 b) 416 c) 464 d)512	CO3	c
		Question -3 In Ethernet, the source address field in the MAC frame is the _____ address. a) original sender's physical b) previous station's	CO3	b

		physical c) next destination's physical d) original sender's service port		
		Question -4 In Ethernet CSMA/CD, the special bit sequence transmitted by media access management to handle collision is called a) Preamble b) Postamble c) Jam d) None of the above	CO3	c

SECTION-B(Answer Any Three Questions. Each Question carries 12 Marks)

Time: 1 Hour and 30 Minutes
(3×12=36 Marks)

Question No	Question	CO Mapping (Each question should be from the same CO(s))
Q.No:8	**Question -1** i. Distinguish between a time-out and 3-duplicate ACKs event. Which one is a stronger sign of congestion in the network? Explain the reason behind the same through an appropriate example. ii. Discuss in detail, how the TCP Reno version handles the 3-duplicate ACK in a different way as compared to TCP Tahoe version that improves the performance of data transmission.	CO2
	Question -2 i. Let the slow start begins with cwnd=1 at time t=0 with a maximum segment size is of 1500 Bytes. What is the RTT value	

	when the cwnd is greater than 25KB? ii. Describe TCP 3-way handshake procedure for connection establishment through the timing diagram. Explain various state changes during this 3-way handshaking through the state transition diagram.	
	Question -3 i. Explain TCP 3-way handshake procedure for connection teardown through the timing diagram. In TCP, does a FIN segment close a connection in only one direction or both? Explain. ii. If you are designing a Selective Repeat protocol with bandwidth of 100 kbps and has a one way delay of 4 seconds. Assuming each packet carries 1 KB of data, what is the minimum number of bits you need for the sequence number?	
Q.No:9	**Question -1** i. The minimum frame size needed for 10 Mbps Ethernet is 512 bits. For 100 Mbps Ethernet, what should this size (in bits) be if we assume same network diameter? Is this packet size desirable or not? Justify. ii. In which persistent techniques used by CSMA protocol, a channel can be idle at the end of a transmission even when there are nodes with traffic to send. Discuss, why CSMA protocol alone is not able to handle the collision rather a collision detection scheme is added on top of it to handle the same.	CO3
	Question -2 i. Describe the Frame format of Ethernet in detail. Justify, why there is a restriction on the minimum as well as maximum frame size of Ethernet.	

	ii. Explain how CRC is used in detecting errors for the polynomial, g(x)=x^4+x+1. Consider the information sequence 1101011011. a) Find the codeword. b) If the code word has error in third bit, what does receiver obtain when it does error checking.	
	Question -3 i. Given the data word 101001111 and the divisor 10111, show the generation of the CRC codeword at the sender site. Assume the codeword has not corrupted during transmission and show at the receiver end that the data has received correctly. ii. Explain Addressing and Channel access control mechanism for Ethernet LAN.	
Q.No:10	**Question -1** i. The fragmentation offset field in an IP header keeps track of the position (in terms of bytes) of the various fragments of an original datagram. Then Justify, how a 13 bit fragmentation offset field can able to store all the posssible positions of a fragment in the original datagram which may vary from 0 to 65535. ii. What is NAT and its responsibility ? Briefly explain, how NAT works through an example.	CO4/CO5
	Question -2 i. Assume a destination computer receives multiple fragments belonging to several datagrams from a source computer. The transmission of the fragments happens on top of a noisy channel (i.e. fragments may be lost, received out of order etc.) . Based on the above assumptions, describe the steps followed to reassembly the	

	fragments at the final destination. ii. An organization requires to setup 1000 hosts in a single network. Describe whether classful or classless addressing will be helpful in reducing the wastage of IP address assignment for this requirement? Also suggest a network id and netmask to fulfil this requirement.	
	Question -3 i. Let us assume an IP datagram can remain in the network for a maximum of 40 senconds before being delivered to the final destination. Calculate the maximum achievable data rate in Mbps at the host, so that no confusion will arise during the reassembly of fragments at the final destination. Assume the size of each datagram in the network is 1000 Bytes. ii. Explain Distance Vector Routing protocol with an appropriate example. Discuss the problems associated and solution for the same.	
Q.No:11	**Question -1** i. Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why? ii. Discuss the functionality provided by DHCP Server. Explain the need of running DHCP client on a well known port instead of an ephemeral port.	CO6
	Question -2 i. Host A wants to send a packet to Host B and Host B needs to reply back with a packet to Host A. In response to this, what are the messages are actually exchanged on the link? Assume empty ARP cache at both nodes and that Host A knows the IP	

	address of Host B. ii. Explain, why a push protocol will not be suitable rather a pull protocol will be used to download a message at the client end? iii.	
	Question -3 i. A 100km long cable runs at 1.536 mbps. The propagation speed in the cable is 2/3 of speed of light. Calculate the number of bits that would be fit in the cable? ii. What is ARP? Describe, at what point of time a ARP request is generated. Explain why an ARP query is sent within a broadcast frame, whereas an ARP response is sent within a unicast frame?	