Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U4403

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Fourth Semester

Electronics and Communication Engineering

21UEC403- DATA COMMUNICATION AND NETWORKS

(Regulation 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Radio waves are CO1-U

   (a) Omnidirectional (b) Bidirectional (c) Unidirectional (d) None of the above

2. Byte stuffing means adding a special byte to the data section of the frame when there is a character with the same pattern as the CO1-U

   (a) Header (b) Trailer

   (c) Flag (d) None of the above

3. What is the purpose of the DHCP server to provide CO1-U

   (a) Storage for Email (b) URL

   (c) provide IP address to host (d) None

4. Beyond IP, TCP provides additional services such as CO1-U

   (a) Routing and switching (b) Sending and receiving of packets

   (c) Multiplexing and demultiplexing (d) Routing and switching

5. In public key encryption (asymmetric encryption) to secure message confidentiality: CO1-U

   (a) encryption is done by private key and decryption is done by public key.

   (b) encryption is done by public key and decryption is done by private key.

   (c) both the key used to encrypt and decrypt the data are public.

   (d) both the key used to encrypt and decrypt the data are private.

PART – B (5 x 3= 15 Marks)

6.	A light signal is travelling through a fiber. What is the delay in the signal if the length of the fiber-optic cable is 50 m, 100 m, and 2 Km (assume a propagation speed of 2×10^8 m)?	CO2-App	
7.	Compute the maximum channel utilization for a MAN which uses CSMA mechanism and has a length of 50 km, and operates at 50 Mbps with a frame length of 2000 bits.	CO2-App	
8.	If a router has 20 entries in its group table, should it send 20 different queries periodically or just one? Explain your answer.	CO1-U	
9.	Discuss about Deadlock situation in congestion.	CO1-U	
10.	Why do we need POP3 or IMAP4 for electronic mail?	CO1-U	

PART – C (5 x 16= 80 Marks)

11.	(a)	Draw a hybrid topology with a ring backbone and two bus networks. Calculate the number of links required to establish that network. Also explain about ring and bus topology.	CO2-App	(16)
		Or		
	(b)	Draw a hybrid topology with a star backbone and three ring networks**.** Calculate the number of links required to establish that network. Also explain about star and ring topology.	CO2-App	(16)
12.	(a)	Analyze Sliding window flow control mechanism and compare its link utilization with stop and wait protocol.	CO3-Ana	(16)
		Or		
	(b)	Analyze ARQ flow control mechanism and compare its link utilization with stop and wait protocol.	CO3-Ana	(16)
13.	(a)	Compare and contrast the options in IPv4 and the extension headers in IPv6. Make a table that shows the presence or absence of each.	CO1- U	(16)
		Or		
	(b)	Write the difference between ICMP and IGMP protocol and explain about ICMP in detail	CO1- U	(16)

14.	(a)	Explain in detail about slow start and congestion avoidance phase.	CO1- U	(16)
		Or		
	(b)	Discuss in detail about the techniques to improve QoS.	CO1- U	(16)
15.	(a)	Illustrate in detail about the File transfer protocol.	CO1- U	(16)
		Or		
	(b)	Describe in detail about DNS and HTTP.	CO1- U	(16)