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**Question Paper Code: U5403**

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

Fifth Semester

Electronics and Communication Engineering

19UEC503 - Data Communication and Networks

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

- Which address identifies a process on a host? CO1-U  
(a) Physical address    (b) Logical address    (c) Port address    (d) Specific address
- 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
- How many bytes are empty in a RIP message that advertises N networks? CO1- U  
(a)  $2 + (10 \times N)$     (b)  $2 \times N$     (c)  $2 \times (10 + N)$     (d)  $2^N$
- If the receiver window size is 12 MSS, then the  $SS_{\text{thresh}}$  will be CO2- App  
(a) 5 MSS    (b) 8 MSS    (c) 6 MSS    (d) 12 MSS
- In the DNS, the names are defined in \_\_\_\_\_ structure. CO1- U  
(a) A linear list.    (b) An inverted-tree.    (c) A graph.    (d) A List

PART – B (5 x 3= 15 Marks)

- What is multipoint connection? How it is related to Bus topology? CO1-U
- A CSMA/CD bus spans a distance of 1.5 km. If the data rate is 5 Mbps what is the minimum frame size? CO2-App
- 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
- Discuss about Deadlock situation in congestion. CO1-U
- Explain how HTTP is related to WWW and FTP. CO1 U

PART – C (5 x 16= 80 Marks)

11. (a) Discuss the different network topologies in detail, with their Performance indicators. CO1-U (16)
- Or
- (b) Discuss in detail about OSI model with neat sketch. CO1-U (16)
12. (a) Draw and explain the frame structure of IEEE 802.3. Also find the minimum frame length for a network of 5 nodes connected using 10 Base T cable. Assume the total propagation delay the network is 50microsec. CO2- App (16)
- Or
- (b) In a CDMA/CD network with a data rate of 10 Mbps, the minimum frame size is found to be 512 bits for the correct operation of the collision detection process. What should be the minimum frame size if we increase the data rate to (a) 100 Mbps? (B) 1 Gbps? (C) 10 Gbps? CO2- App (16)
13. (a) A router with IPv4 address 125.45.23.12 and Ethernet physical address 23:45:AB:4F:67:CD has received a packet for a host destination with IP address 125.11.78.10. Show the entries in the ARP request packet sent by the router and also ARP Packet sent in response. Assume no sub netting. CO2- App (16)
- Or
- (b) Show the autonomous system with the following specifications: CO2- App (16)  
There are eight networks (N1 to N8), eight routers (R1 to R8), N1, N2, N3, N4, N5, and N6 are Ethernet LANs, N7 and N8 are point-to-point WANs, R1 connects N1 and N2, R2 connects N1 and N7, R3 connects N2 and N8, R4 connects N7 and N6, R5 connects N6 and N3, R6 connects N6 and N4, R7 connects N6 and N5, R8 connects N8 and N5. Draw the graphical representation of the autonomous system as seen by OSPF
14. (a) (i) Explain leaky bucket and token bucket algorithms in detail. CO1- U (8)  
(ii) Explain in detail about TCP connection establishment and connection termination with neat diagrams. CO1- U (8)
- Or
- (b) Discuss the various timers used by TCP to perform its various operations CO1- U (16)

15. (a) Explain in detail about Electronic mail. CO1- U (16)
- Or
- (b) Briefly Explain the steps involved in RSA algorithm. CO1- U (16)

