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Question Paper Code : 80530

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth Semester

Electronics and Communication Engineering

EC 8551 – COMMUNICATION NETWORKS

(Common to: Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate simplex, Half-Duplex and Full-Duplex modes of communication.
2. What are the functions of Data-Link layer?
3. Why does the classless addressing is preferred over classful addressing?
4. Draw a neat diagram of Bluetooth frame format.
5. Define flooding and highlight its disadvantage.
6. What are the issues with IPv4 which lead to the transition to IPv6.
7. Differentiate TCP and UDP.
8. How does UDP provides best-effort service?
9. What is the functionality of DNS?
10. Differentiate between Substitution and Permutation in encryption.

PART B — (5 × 13 = 65 marks)

11. (a) (i) With a neat diagram explain OSI model with functionalities of each layer. (7)

(ii) Explain the operation of basic network topologies, advantages and associated limitations with a neat sketch. (6)

Or

(b) Explain the Learning process and Loop problem in Learning bridge.

12. (a) (i) Draw a neat sketch of Ethernet frame format and explain in detail. (6)

(ii) Explain the different classes in IPv4 addressing, what is the role of MAC address and how is it different from IP address? (7)

Or

(b) (i) What is adhoc network? Describe the Piconet and Scatternet with neat sketch. (8)

(ii) Explain Hidden and Exposed Station Problem in WLAN. (5)

13. (a) (i) Explain two-node instability with a neat diagram. (7)

(ii) Explain the steps to build the Link-state routing table. (6)

Or

(b) (i) Explain Path vector routing in detail. (7)

(ii) Explain the two primary BGP attributes AS-PATH and NEXT-HOP with example. (6)

14. (a) (i) Explain each fields of TCP segment format with a neat sketch. (8)

(ii) What does triple duplicate ACK indicates in TCP retransmission? Explain with a neat diagram. (5)

Or

(b) (i) With a neat sketch, explain three different phases of handling congestion in TCP with examples. (8)

(ii) How does DECbit and RED handles congestion in network? How are they different? (5)

15. (a) Explain DES cipher technique with the neat diagram indicating the implementation details. (13)

Or

(b) (i) Describe peer to peer network with a diagram, differentiate peer to peer network and client server model. (5)

(ii) Write short notes on the following protocols: SMTP, POP3, IMAP and MIME. (4×2)

PART C — (1 × 15 = 15 marks)

16. (a) Design and construct a network topology to enable internet access. Draw a neat sketch to depict the IP network and explain the respective topology. Requirements: The network must include all the network connecting devices and the basic protocols associated with reference to each layer of OSI model.

Or

(b) (i) Explain the differences between broadcast, multicast and multiple unicast using neat diagram Fig. 16 (b). (7)

(ii) Consider the network shown below. (i) AS3 and AS2 are running OSPF for their intra-AS routing protocol. (ii) AS1 and AS4 are running RIP for their intra-AS routing protocol. (iii) eBGP and iBGP are used for the inter-AS routing protocol. (iv) Initially assume there is no physical link between AS2 and AS4.

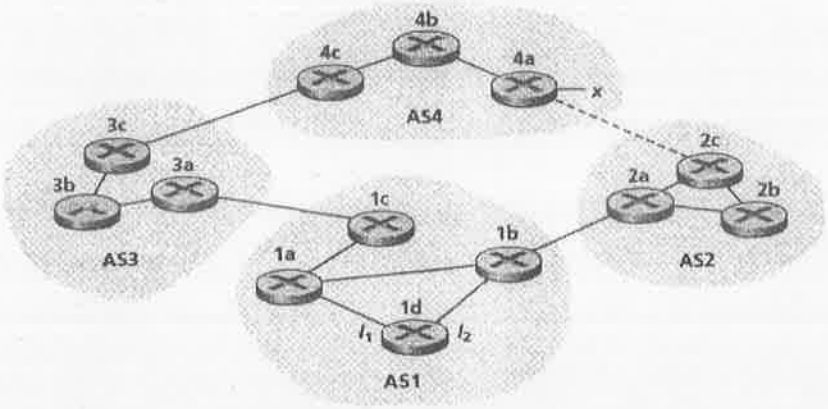

Fig. 16 (b)

(1) Router 3c learns about prefix x from which routing protocol: OSPF, RIP, eBGP, or iBGP? (2)

(2) Router 3a learns about x from which routing protocol? (2)

(3) Router 1c learns about x from which routing protocol? (2)

(4) Router 1d learns about x from which routing protocol? (2)