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Roll No. Total Pages : 3

311503

December 2023

BCA - V SEMESTER

Data Communication and Networking

(BCA-17-303)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART-A

1. (a) Six channels each with 200 KHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 30 KHz between the channels to prevent the interference? (1.5)

- (b) A signal is carrying data in which one data element is encoded as one signal element ($r = 1$). If the bit rate is 100 kbps, what is the average value of the baud rate if c is between 0 and 1? (1.5)
- (c) List the advantages of full duplex Ethernet LAN. (1.5)
- (d) How is the simple parity check related to the two-dimensional parity check? (1.5)
- (e) In a block of addresses, we know the IP address of one host is 182.44.82.16/26. What are the first address (network address) and the last address in this block? (1.5)
- (f) Distinguish between a circuit-switched network and a packet-switched network. (1.5)
- (g) What is the significance of the twisting in twisted-pair cable? (1.5)
- (h) What do we mean when we say that a bridge can filter traffic? Why is filtering important? (1.5)
- (i) State how repeaters are different from amplifiers. (1.5)
- (j) Differentiate between symmetric-key and asymmetric-key cryptography. (1.5)

PART-B

2. (a) Explain OSI model using suitable diagram. Also discuss how it is different from TCP/IP model? (5)

- (b) Discuss the importance of multiplexing and briefly explain various multiplexing techniques. (5)
3. (a) Compare and contrast the Go-Back-N ARQ Protocol with Selective-Repeat ARQ. (10)
- (b) Given the dataword 1010011110 and the divisor 10111. Show the generation of the codeword at the sender site using CRC method (using binary division). (5)
4. (a) Describe Synchronous and Asynchronous Transmission in detail using suitable example. (10)
- (b) Discuss the advantages of optical fiber over twisted-pair and coaxial cable. (5)
5. (a) Elaborate the process of initialization and updation of routing tables in Distance Vector Routing using suitable example. (10)
- (b) Explain open loop congestion control techniques. (5)
6. (a) Discuss Data Encryption Standard (DES) in detail. (10)
- (b) Differentiate between routers and switches. (5)
7. Write short note on the following :
- (a) Virtual LAN.
- (b) ATM.
- (c) Modulation techniques. (15)