



CBCS SCHEME

15CS46

Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Data Communications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is data communication? Discuss different criterias necessary for an effective and efficient network. (04 Marks)
- b. Assume eight devices are arranged in a mesh topology how many cables are needed? How many ports are needed for each device? (02 Marks)
- c. Explain the layers in TCP/IP protocol suit. (08 Marks)
- d. If a peak voltage of a signal is 20 times the peak voltage of the noise what is SNR and SNR_{dB}. (02 Marks)

OR

- 2 a. Explain different causes for transmission impairment. (06 Marks)
- b. Draw the graph of NRZ-L, NRZ-I and Bipolar schemes using the following data stream 0101100. (04 Marks)
- c. Bringout the major difference between TCP/IP and OSI model. (03 Marks)
- d. What is the total delay for a frame of size 5 million bits that is being sort on a link with 10 routers each having a queuing time of $2\mu\text{s}$ and processing time of $1\mu\text{s}$. The length of the link is 2000km, the speed of the light inside the link is $2 \times 10^8\text{m/s}$. The link has a bandwidth of 5Mbps. (03 Marks)

Module-2

- 3 a. With a neat diagram, explain the most common technique to change analog signal to digital data. (09 Marks)
- b. In a digital transmission the sender clock is 0.3 percent faster than the receiver clock. How many extrabits per second does the sender send if the data rate is 1 Mbps. (03 Marks)
- c. Explain different aspects of analog to digital conversion. (04 Marks)

OR

- 4 a. List out basic multiplexing techniques. Explain any one in detail. (05 Marks)
- b. Explain the concept of Direct sequence spread spectrum. (04 Marks)
- c. With neat diagram, explain virtual circuit networks. (05 Marks)
- d. We have an available bandwidth of 100kHz which spans from 200 to 300kHz. What should be carrier frequency and the bit rate if we modulated our data by using FSK with $d = 1$? (02 Marks)

Module-3

- 5 a. Given dataword 101001111 and devisor 10111, show the generation of CRC codeword at the sender site. (06 Marks)
- b. Bit stuff the following frame payload 000111110000111110100011111011110000111 (03 Marks)
- c. With neat diagram, explain point-to-point protocol frame format. (05 Marks)
- d. Prove that the code represented by the following codewords is not linear: [(00000), (01011), (10111), (11111)] (02 Marks)

1 of 2

OR

- 6 a. Explain flow diagram for stop and wait protocol. (05 Marks)
 b. With neat diagram explain different frame types available in HDLC. (06 Marks)
 c. Assume a packet is made any of four 16 bit words $(466F)_{16}$, $(726F)_{16}$, $(757A)_{16}$ and $(616E)_{16}$. Find the sender site check sum using traditional checksum algorithm. (05 Marks)

Module-4

- 7 a. Explain different persistence methods. (06 Marks)
 b. What are orthogonal sequences give their properties. (03 Marks)
 c. We have pure ALOHA network with 100 stations. If T_{fr} is $1\mu s$. What is the number of frames each station can send to achieve the maximum efficiency? (02 Marks)
 d. Explain Ethernet frame format. (05 Marks)

OR

- 8 a. Discuss hidden station problem. (06 Marks)
 b. Explain with a neat diagram MAC layer frame format. (06 Marks)
 c. What is Bluetooth, explain any one Bluetooth network. (04 Marks)

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Module-5

- 9 a. Draw a cell pattern with frequency reuse factor of 5. (02 Marks)
 b. What is WIMAX discuss different services it provides to the subscribers. (07 Marks)
 c. An organization is assigned the block 2000:1456:2474/48. What is the CIDR notation for the block in the first and second subnet in this organization? (02 Marks)
 d. List major strategies involved in transition from IPV4 to IPV6, explain any two in detail. (05 Marks)

OR

- 10 a. Explain IPV4 datagram format. (08 Marks)
 b. With the help of flow diagram discuss how mobile host and remote host communicates in mobile Ip. (06 Marks)
 c. According to Kepleri law, what is the period of satellite that is located at an orbit approximately 35,786km? (02 Marks)
