USN | | | | | | | | | | | **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 2μs and processing time of 1μs. The length of the link is 2000km, the speed of the light inside the link is 2×10^8m/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 00011111000011111010001111110111100000111 **(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)**

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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 orthogal sequences give their properties. **(03 Marks)**
   c. We have pure ALOHA network with 100 stations. If T_{fr} is 1μs. 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)**

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 I_p. **(06 Marks)**
   c. According to Kepleri law, what is the period of satellite that is located at an orbit approximately 35,786km? **(02 Marks)**

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