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By K B Hemanth Raj

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CBCS SCHEME

USN

17CS46

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Data Communications

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Describe data communication and its components. **(05 Marks)**
b. Analyze the principle behind protocol layering. Enumerate the functions of different layers of OSI model. **(10 Marks)**
c. Differentiate Defacto standard and Dejure standard. **(05 Marks)**

OR

2 a. Analyze the causes of transmission impairments. **(05 Marks)**
b. Define line coding. Enumerates the challenges in line coding. Draw the line code of the sequence 010011110 using polar NRZ – L and NRZ – I schemes. **(10 Marks)**
c. In a digital transmission, the receiver clock is 0.3 percent faster than the sender clock. How many extra bits per second does the receiver receive if the data rate is 1Mbps. **(05 Marks)**

Module-2

3 a. Explain the three step procedure of pulse code modulation for analog to digital conversion with example. **(10 Marks)**
b. Briefly explain with neat diagrams. Amplitude shift keying and frequency shift keying modulation techniques. Specify bandwidth requirements. **(05 Marks)**
c. An analog signal has a bit rate of 8000 bps, and a baud rate of 1000 baud. How many data element are carried by each signal elements? How many signal elements do we need? **(05 Marks)**

OR

4 a. Describe about Frequency Division Multiplexing in brief with neat diagram. **(05 Marks)**
b. What is circuit switching? Enumerate the characteristics of circuit, switching. Analyze the three stages of circuit switching. **(10 Marks)**
c. Analyze how message can be transmitted from one system to another using datagram network and calculate the total delay in the network. **(05 Marks)**

Module-3

5 a. Describe three types of errors. **(05 Marks)**
b. Explain the encoder and decoder logic of Cyclic Redundancy Check (CRC) coding with neat diagram. **(10 Marks)**
c. Given message = 1011011, k = 7 and generator polynomial $P(X) = X^3 + X^2 + X^0$, n = 3. Find the codeword and design the checker in the receiver using Cyclic Redundancy Codes (CRC). **(05 Marks)**

OR

6 a. Explain the working of stop-and-wait protocol for Noiseless channels. **(05 Marks)**
b. Explain selective repeat ARQ protocol for noisy channels. **(05 Marks)**
c. Explain the frame format of HDLC protocol. **(05 Marks)**
d. Describe the transition phases of PPP protocol with Finite State Machines. **(05 Marks)**

Module-4

7 a. Analyze the need for access control protocols. Explain the working of CSMA/CD with suitable diagrams. **(10 Marks)**
   b. Describe pure ALOHA and slotted ALOHA protocols. **(05 Marks)**
   c. Discuss 802.3 MAC frame format. **(05 Marks)**

OR

8 a. Analyze Gigabit Ethernet. **(05 Marks)**
   b. Brief on Bluetooth and explain the architecture of Bluetooth. **(05 Marks)**
   c. Analyze channelization. Explain Code Division Multiple Access (CDMA) with an example. **(10 Marks)**

Module-5

9 a. Explain the operation of cellular telephony. **(05 Marks)**
   b. Explain the working of mobile IP. **(05 Marks)**
   c. Analyze satellite networks and its different categories. **(10 Marks)**

OR

10 a. Explain IP datagram header format with neat diagram and given the description of each field. **(10 Marks)**
   b. Explain the transition from IPV4 to IPV6. **(05 Marks)**
   c. Write a short note on fixed WiMax. **(05 Marks)**

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