

# CBCS SCHEME



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15CS46

## Fourth Semester B.E. Degree Examination, Jan./Feb. 2021 Data Communication

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Define Topology. Explain four basic topologies. (08 Marks)
- b. What are the factors that determine whether a communication system is a LAN or WAN? (04 Marks)
- c. Differentiate between Packet switched network and Circuit switched network. (04 Marks)

OR

- 2 a. With a neat diagram of TCP/IP protocol suite, discuss each layer of the suite. (08 Marks)
- b. A line has a signal – to – noise ratio of 1000 and a bandwidth of 4000 KHz. What is the maximum data rate supported by the line? (04 Marks)
- c. For the given data : 0 1 1 0 0 1, plot the waveform for NRZ – L , NRZ– I , RZ and Manchester line coding schemes. (04 Marks)

### Module-2

- 3 a. Explain the process of Pulse Code Modulation (PCM), with illustrations in each process. (08 Marks)
- b. We have sampled a low pass signal with a bandwidth of 200 KHz, using 1024 levels of quantization :
  - i) Calculate the bit rate of the digitized signal
  - ii) Calculate  $SNR_{dB}$  for this signal
  - iii) Calculate PCM bandwidth of this signal. (08 Marks)

OR

- 4 a. Discuss the following digital to analog conversion mechanisms :
  - i) ASK
  - ii) FSK
  - iii) PSK. (08 Marks)
- b. Write the taxonomy of switched networks and their presence in the TCP / IP protocol suite layers. And explain circuit switched network and packet switched network with respect to delay. (08 Marks)

### Module-3

- 5 a. Given the data {1001} and the divisor {1011}, simulate Cycle Redundancy Code (CRC) using i) Paper – and – Pencil division process ii) Polynomials. (06 Marks)
- b. Suppose the message is {7, 11, 12, 0, 6} each of 4 bit. Calculate the checksum and simulate for error free and error example. (06 Marks)
- c. What is the Hamming distance for i) Error detection ii) Error correction? Explain. (04 Marks)

OR

- 6 a. Using an example, explain Stop – and – Wait protocol with Piggy backing. (08 Marks)
- b. Explain HDLC framing types. (08 Marks)



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**Module-4**

- 7 a. What is Controlled access? Discuss three Controlled access methods. (06 Marks)  
b. Explain Ethernet frame format. (06 Marks)  
c. Define the following destination addresses :  
i) 4A : 30 : 10 : 21 : 10 : 1A  
ii) 47 : 20 : 1B : 2E : 08 : EE  
iii) FF : FF : FF : FF : FF : FF. (04 Marks)

**OR**

- 8 a. Compare three Fast Ethernet implementation. (06 Marks)  
b. Discuss the hidden and exposed terminal / station problem in IEEE 802.11. (04 Marks)  
c. Write a short note on Bluetooth layers. (06 Marks)

**Module-5**

- 9 a. Compare two services of WiMAX. (04 Marks)  
b. Discuss the following operations of cellular telephones :  
i) Frequency reuse principle ii) Handoff. (04 Marks)  
c. Explain IPV4 datagram format. (08 Marks)

**OR**

- 10 a. Write a short note on Messages of ICMPV4 protocol. (06 Marks)  
b. Explain the following ICMPV4 debugging tools :  
i) Ping ii) Trace route. (06 Marks)  
c. Discuss IPV6 extension headers. (04 Marks)

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