



# CBCS SCHEME

18CS46

## Fourth Semester B.E. Degree Examination, June/July 2023 Data Communication

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain OSI model with neat diagram. (10 Marks)
- b. Explain the components of data communication with diagram. (06 Marks)
- c. Explain the fundamental characteristics of data communication. (04 Marks)

OR

- 2 a. What is transmission impairment? Briefly explain three causes of transmission impairment. (08 Marks)
- b. Consider a noiseless channel with a bandwidth of 3000Hz transmitting a signal with two signal levels, calculate the maximum bit rate. (06 Marks)
- c. Explain: i) Bandwidth ii) Throughput iii) Latency. (06 Marks)

### Module-2

- 3 a. What line coding? Explain any five characteristics of line coding technique. (06 Marks)
- b. Explain polar NRZ (Non Return Zero) line coding scheme with example. (08 Marks)
- c. Give the Manchester and Differential Manchester encoding for bitstream 010011. (06 Marks)

OR

- 4 a. Explain the steps involved in Pulse Code Modulation (PCM) encoder. What is PCM? (10 Marks)
- b. Discuss the different modes of data transmission. (04 Marks)
- c. Explain Frequency Shift Keying (FSK) and Phase Shift Keying (PSK). (06 Marks)

### Module-3

- 5 a. What is multiplexing? Explain the frequency division multiplexing with neat diagram. (07 Marks)
- b. What is spread spectrum? Explain Direct sequence spread spectrum with neat diagram. (07 Marks)
- c. Explain circuit switching and packet switching network. (06 Marks)

OR

- 6 a. Explain the three phases involved in the communication of circuit switched Network. (06 Marks)
- b. Find the codeword  $c(x)$ , using CRC for the information 1001 with generator 1011. (06 Marks)
- c. With neat diagram, explain the error detection in block coding technique. (08 Marks)

### Module-4

- 7 a. With neat FSM explain stop and wait protocol for data link layer to deal with flow and error control. (10 Marks)
- b. Explain the PPP frame format. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. List and explain the different controlled access protocols. (10 Marks)  
b. Find the class of the following Class full IP address  
i) 130.34.54.12 ii) 200.34.2.1 iii) 245.34.2.8 iv) 110.11.5.8. (04 Marks)  
c. Explain the following: i) DHCP ii) NAT. (06 Marks)

Module-5

- 9 a. Describe the structure of 802.3MAC frame. (10 Marks)  
b. Define Bluetooth and explain the architecture of Bluetooth. (10 Marks)

OR

- 10 a. With neat sketch explain BSS and ESS. (08 Marks)  
b. What is Cellular telephony? With neat diagram explain cellular system. (06 Marks)  
c. Explain the first, second and third generation of cellular telephony. (06 Marks)

\*\*\*\*\*