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## 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. Define Data communication. Explain the fundamental characteristics of a data communication system with a neat diagram, explain the components of a data communication. (08 Marks)
- b. Analyze the principle behind protocol layering. Explain TCP/IP protocol suite with neat diagram. (08 Marks)
- c. Describe simplex, half duplex and full duplex with respect to data communication. (04 Marks)

OR

- 2 a. Define line coding. Which are the broad categories of line coding? Explain the various characteristics of the coding schemes. (10 Marks)
- b. Define transmission impairment. Explain different causes of transmission impairment during signal transmission. (07 Marks)
- c. What are the various measures that evaluate the network performance? (03 Marks)

### Module-2

- 3 a. Explain the three step procedure of pulse code modulation for analog to digital conversion with example. (08 Marks)
- b. With diagram, explain the implementation techniques of BPSK and QPSK. (08 Marks)
- c. We need to send data 3 bits at a time at a bit rate of 3Mbps. The carrier frequency is 10MHz. Calculate the number of levels (different frequencies) band rate and bandwidth. (04 Marks)

OR

- 4 a. Define multiplexing and de-multiplexing. With the diagram, explain the frequency division multiplexing technique and specify its applications. (08 Marks)
- b. What is spread spectrum? Explain FHSS and DSSS technique used for spreading the spectrum. (08 Marks)
- c. List the characteristics of virtual circuit networks and bringout the difference between two types of addressing used in VCN. (04 Marks)

### Module-3

- 5 a. Explain the encoding and decoding process of parity check code used for error detecting. (08 Marks)
- b. Explain FSM of stop and wait protocol. (07 Marks)
- c. Find the code word for the following using CRC. Given information polynomial  $i) x = x^6 + x^3$  and generator polynomial  $g(x) = x^3 + x + 1$ . (05 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

- 6 a. Explain three different types Frame Format of HDLC protocol. Explain the control Fields and its functionality of each. (12 Marks)
- b. Explain PPP protocol Frame Format with the diagram, also mention the different transition phases of PPP. (08 Marks)

**Module-4**

- 7 a. What is channelization? Explain the channelization protocols. (08 Marks)
- b. Mention different controlled access methods and explain them briefly. (07 Marks)
- c. Explain the characteristics of standard Ethernet. (05 Marks)

OR

- 8 a. Explain MAC sub layer of IEEE 802.11 wireless LAN. (08 Marks)
- b. Explain the architectures of Bluetooth. (07 Marks)
- c. Explain the characteristics of Gigabit Ethernet. (05 Marks)

**Module-5**

- 9 a. With neat diagram, describe cellular telephony network. (08 Marks)
- b. Give the IPV4 datagram format and brief description of each field. (08 Marks)
- c. Explain in detail, the ICMPV4 protocol. (04 Marks)

OR

- 10 a. Explain mobile IP with phases. (08 Marks)
- b. Explain in detail IPV6 packet format. (07 Marks)
- c. Explain in detail, the transition from IPV4 to IPV6. (05 Marks)

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