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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec. - 2019

Data Communication

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

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|------|---|----|
| 1 a. | List and explain the components of data communication. | 6 |
| b. | Explain star topology and bus topology along with their advantages and disadvantages. | 8 |
| c. | List and explain the causes of transmission impairment. | 6 |
| 2 a. | Explain the layers of TCP/IP protocol suite in detail. | 10 |
| b. | Differentiate between half duplex and full duplex transmission modes. | 4 |
| c. | Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels and four signal levels. Calculate its maximum bit rate. | 6 |

UNIT - II

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|------|---|---|
| 3 a. | Explain Delta Modulation (DM) technique in detail. | 8 |
| b. | List and explain the different transmission modes for the transmission of the data. | 8 |
| c. | An analog signal carries 4 bits per signal element. If 1000 signal elements are sent per second, find the bit rate. | 4 |
| 4 a. | Demonstrate the stream 10110110 using Uni-Polar NRZ, Polar RZ and Manchester line coding schemes. | 6 |
| b. | Explain three ways of Analog-to-Analog conversion in detail. | 9 |
| c. | Explain Direct Sequence Spread Spectrum (DSSS) in detail. | 5 |

UNIT - III

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|------|---|---|
| 5 a. | With neat diagram, explain coaxial cable along with performance and applications. | 9 |
| b. | Explain the structure of packet switches in detail. | 6 |
| c. | List and explain the different services provided by the data link layers. | 5 |
| 6 a. | Differentiate between circuit switched network and packet switched network. | 6 |
| b. | Explain the Address Resolution Protocol operation with neat diagram. | 8 |
| c. | List the advantages and disadvantages of optical fiber. | 6 |

UNIT - IV

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| 7 a. | A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is $x^4 + x + 1$. What is the actual bit string transmitted? | 8 |
| b. | Explain point-to-point protocol frame format in detail. | 7 |
| c. | Explain TDMA channelization protocol. | 5 |

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|------|--|---|
| 8 a. | Explain stop-and-wait protocol along with FSM. | 8 |
| b. | Explain three types of HDLC frames. | 8 |
| c. | Mention types of errors with example. | 4 |

UNIT - V

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|-------|--|---|
| 9 a. | With neat diagram, explain Ethernet frame format. | 8 |
| b. | Explain the four functional layers of SONET. | 6 |
| c. | List and explain characteristics of wireless LAN protocol. | 6 |
| 10 a. | Write a short note on Fast Ethernet. | 6 |
| b. | With neat diagram, explain architecture of an ATM network. | 8 |
| c. | Explain two types of networks defined by Bluetooth. | 6 |

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