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

(An Autonomous Institution affiliated to VTU, Belgaum)

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

Semester End Examination; Dec - 2016/Jan - 2017

Data Communications

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

- 1 a. What is data communication? List and explain the five components of data communication. 6
- b. What are standards? Name any four standard organizations. 6
- c. Explain OSI reference model with functions of following layer : 8
 - i) Physical layer
 - ii) Data link layer
 - iii) Network layer.
- 2 a. With neat diagram, explain Mesh topology and Star topology. 6
- b. Give the comparison between LAN, MAN and WAN with an example. 6
- c. Write a descriptive note on the three causes of transmission impairment. 8

UNIT - II

- 3 a. With neat wave form, explain unipolar NRZ, Polar NRZ, Manchester encoding by applying on the information sequence 101011100. 10
- b. Calculate the Shanon channel capacity in the following cases, 6
 - i) $B_w = 20$ kHz, $SNR_{dB} = 40$
 - ii) $B_w = 200$ kHz, $SNR_{dB} = 6$.
- c. A periodic signal has a bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the lowest frequency? Draw the spectrum, if the signal contains all frequencies of the same amplitude. 4
- 4 a. Explain three methods of digital to analog conversion. Draw the waveform with input 110100. 6
- b. What is multiplexing? With neat diagram, explain FDM. 6
- c. What is TDM? Four sources create 250 characters per second. The frame contains one character from each source and one extra bit for synchronization. Find; 8
 - i) The data rate of each source
 - ii) Duration of each character in each source
 - iii) Frame rate
 - iv) Frame size in bits.

UNIT - III

- 5 a. Briefly explain the twisted pair and optical cable with diagrams. 10
- b. Explain the structure of the encoder and decoder for a Hamming code with example. 10
- 6 a. What is CRC? If the generating polynomial for CRC is $x^4 + x^3 + 1$ and message word is 11110000. Determine check bit and code word. 8
- b. Explain briefly with neat figure and flow diagram Stop and Wait ARQ and Go back N ARQ. 12

UNIT - IV

- 7 a. Discuss HDLC Protocols. 10
- b. What is random access? Explain the following random access protocol; 10
 - i) ALOHA
 - ii) CSMA/CD.
- 8 a. Describe frame format for IEEE 802.3 MAC frame. What are the silent features of fast Ethernet? 10
- b. Define channelization and explain FDMA and TDMA. 10

UNIT - V

- 9 a. Discuss the 802.11 MAC layer frame format. 10
- b. How does a virtual LAN help full in providing security and reduces the network traffic? 10
- 10a. Bring out difference between Repeater, Bridges, Router and Gateways. 10
- b. Discuss Blue Tooth Technology. 10

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