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![PES logo] **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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