

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2161704****Date: 03/05/2017****Subject Name: Analog and Digital communication****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	Short Questions	14
	1 List the types of Modems.	
	2 If two code words are 1101 and 0110 then what is the hamming distance between them.	
	3 Which layer of the OSI determines the interface of system with the user?	
	4 If the frequency of modulating/ baseband signal is 5KHz then what is the height of antenna required?	
	5 For Fully Connected Network, if no. of nodes are 10 then how many links are required to interconnect them?	
	6 How many Ex-OR gates are required to make 4 bit Parity Generator?	
	7 What is the total power radiated equation if modulation index is 1?	
	8 Write a full form of EIA and ISO?	
	9 What is Balance Modulator?	
	10 Introduce following term : Bit Error Rate	
	11 List various Microwave Components.	
	12 Introduce following term: Combanding	
	13 If frequency of modulating signal is 5Khz then how much bandwidth is required according to Carson's rule.	
	14 Draw OOK waveform for data 10101.	
Q.2	(a) Give classification of Noise.	03
	(b) Two resistors 10 k Ω and 25 k Ω are at room temperature for a bandwidth of 150 kHz. Calculate thermal noise for each resistor, if two resistors are in series and two resistors are in parallel. Assume room temperature = 290° K	04
	(c) Explain importance of modulation in communication with suitable example.	07
	OR	
	(c) Briefly describe OSI model architecture.	07
Q.3	(a) A carrier is modulated to a depth of 75 percent. If total power in modulated wave is 512.5 W, calculate carrier power	03
	(b) With diagram explain importance of DTE and DCE in data communication.	04
	(c) Define noise figure. Explain noise figure calculation	07
	OR	
Q.3	(a) Give comparison of Amplitude and Frequency modulation.	03
	(b) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93A when the carrier is modulated by a single sine wave. (i) Find the percentage modulation. (ii) Determine the antenna current when the percentage of the modulation changes to 0.8.	04
	(c) Derive equation for AM wave. Draw amplitude spectrum for m=1. Also draw the frequency spectrum of AM wave.	07

- Q.4** (a) List and sketch various Data Topologies. **03**
 (b) Derive the formula for the instantaneous value of an FM voltage and define the modulation index. **04**
 (c) Explain IEEE 802.5 Token Ring **07**
- OR**
- Q.4** (a) Draw block diagram of FSK modulator and demodulator. **03**
 (b) Explain adaptive delta modulation. **04**
 (c) Compute the CRC-4 character for the following message using a “divisor” constant of 10011:
 1100 0110 1011 01 **07**
- Q.5** (a) List bit oriented protocols. **03**
 (b) Discuss advantages and disadvantages of communication using optical fiber. **04**
 (c) Describe RS232C interface standard and draw its null modem configuration. **07**
- OR**
- Q.5** (a) Draw System Network Architecture and What is the function of SNA? **03**
 (b) Explain GEO, LEO and MEO satellites **04**
 (c) Describe SONET topology and its frame. **07**
