Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:161704   **Date:14/12/ 2015**
Subject Name: Analog and Digital Communication
Time:2:30pm to 5:00pm   **Total Marks: 70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Derive the expression of AM wave. Also draw the frequency spectrum for AM wave.	**07**
	(b)	Compare AM, FM and PM system in detail.	**07**
Q.2	**(a)**	An AM transmitter supplies 10 kW of carrier power to a 50 Ω load. It operates at a carrier frequency of 1.2 MHz and is 80% modulated by a 3 kHz sine wave. (i) Sketch the signal in frequency domain with frequency and power scales. Show the power in dBW. (ii) Calculated the total average power in the signal in watts and in dBW. (iii) Calculate the RMS voltage of the signal. (iv) Calculate the peak voltage of the signal.	**07**
	(b)	Derive the Friss formula for overall noise factor of amplifiers in cascade.	**07**

OR

	(b)	Two resistors 50 kΩ and 30 kΩ are at room temperature. For a bandwidth of 100 kHz, Calculate thermal noise voltage for each resistor, two resistors in series and two resistors in parallel. Assume room temperature = 290 K.	**07**
Q.3	**(a)**	Explain ASK, FSK and PSK with waveforms.	**07**
	(b)	Give comparison of wideband and narrowband FM.	**07**

OR

Q.3	**(a)**	Write a note on pulse code modulation.	**07**
	(b)	Explain the pre-emphasis & De-emphasis.	**07**
Q.4	**(a)**	Calculate bit-error rate and error free seconds for a system that experienced five errors in 25Mbytes of data transmitted in 20 seconds. Three errors occurred in ninth second of transmission and the two errors in the last second of transmission.	**07**
	(b)	Describe quadrature phase shift key modulator.	**07**

OR

Q.4	**(a)**	List methods for error detection and error correction. Explain any one method in detail.	**07**
	(b)	Give the Comparison between SDLC and HDLC.	**07**
Q.5	**(a)**	Explain the losses in fiber cable.	**07**
	(b)	Briefly describe OSI model architecture.	**07**

OR

Q.5	**(a)**	Explain the 8PSK Modulator.	**07**
	(b)	Explain in brief about GEO, LEO and MEO satellites.	**07**

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