Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-IV Examination-Nov/Dec-2011

Subject code: 141102 **Date: 02/12/2011**

Subject Name: Communication Engineering

Time: 02.30 pm -5.00 pm **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)**	Draw block diagram of basic communication system and explain each block.	**03**
		Discuss various types of communication system as per the signal transmitted and medium use for transmission.	**04**
	(b)	Explain need of modulation. Derive equation for AM wave. Draw amplitude spectrum for m=1. Also draw the frequency spectrum of AM wave	**07**
Q.2	**(a)**	Explain following terms (i)Bandwidth (ii) Modulation index (iii) frequency deviation.	**03**
		Antenna current of an AM transmitter is 8A when only carrier is sent, it increases to 9A when carrier is modulated by a single sine wave. Find the percentage modulation. Determined the antenna current when percent modulation changes to 50%	**04**
	(b)	Explain various internal sources of noise with necessary formulas	**07**
		OR	
	(b)	What is noise figure. Derive the Friss formula for cascade connection of amplifier.	**07**
Q.3	**(a)**	Explain (i) frequency modulation (ii) pilot carrier (iii)broad cast transmission.	**03**
		Total power content of an AM signal is 2000W. Determine the power being transmitted at the carrier frequency and each of the side bands when m=0.6.	**04**
	(b)	Explain advantages of SSB transmission. With block diagram and formulas, Explain the “THIRD METHOD” of SSB generation.	**07**
		OR	

Q.3	**(a)**	Explain (i) duplex communication (ii) detector (iii)FDM	**03**
		A 100MHz carrier has a peak voltage of 10 volt. Carrier is frequency modulated by a sinusoidal modulating waveform of frequency 4KHz such that frequency deviation is 75KHz. Write the expression for the frequency modulated carrier.	**04**
	(b)	Draw the block diagram of super hetrodyne radio receiver and explain each block.	**07**
Q.4	**(a)**	Explain (i) S/N ratio. (ii) flicker noise (iii) atmospheric noise	**03**
		Two resisters of 30k ohm and 50K ohm are at room temperature. For Bandwidth of 100KHz, calculate the thermal noise voltage generated by each resister, two resistor in series and two resistor in parallel	**04**
	(b)	What is advantages of digital communication over analog communication. Draw the block diagram of PCM system. Explain each block	**07**
		OR	
Q.4	**(a)**	Explain (i) bit rate (ii) TDM (iii) Telegraphy	**03**
		Find the Nyquiste rate and Nyquiste interval for the signal $F(t)=\cos 5000\pi t * \cos 3000\pi t$.	**04**
	(b)	Explain how digital communication can reduce the noise. State and prove the sampling theorem.	**07**
Q.5	**(a)**	Explain following terms(i) total internal reflection (ii) numerical aperture (iii) graded index fiber	**03**
		Write short note on Dispersion	**04**
	b)	Draw the block diagram of a television receiver and explain each block.	**07**
		OR	
Q.5	**(a)**	Explain (i) contrast control (ii) picture tube (iii) AGC	**03**
		Write short note on “scanning technique” in television	**04**
	(b)	Explain advantages of fiber optic cable over coaxial cable . Draw and explain the block diagram of basic fiber optic communication system	**07**

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