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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2163206 **Date: 03/05/2017**

Subject Name: Analog and Digital Communication (ICT)

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.**

Q.1		**Answer the following.**	**14**
	1	Define Modulation.	
	2	What is the need of Modulation?	
	3	What are the analog analogies of PAM, PPM & PWM?	
	4	What is the purpose of PPM?	
	5	What do you mean by FM and classify FM.	
	6	Define modulation index for AM.	
	7	Define selectivity.	
	8	What is the bandwidth of AM?	
	9	What is called image frequency?	
	10	Define modulation index of frequency modulation.	
	11	Define ASK.	
	12	Define Noise figure	
	13	Define Shot noise	
	14	Define Spread spectrum communication.	
Q.2	**(a)**	Explain block diagram of analog communication system	**03**
	(b)	Draw the block diagram of Tuned Radio Frequency (TRF) Receiver and explain its operation. Describe the problems in TRF receiver.	**04**
	(c)	Discuss Noise Factor. Derive the expression for noise factor of amplifiers connected in cascade	**07**
		OR	
	(c)	Explain External Noise	**07**
Q.3	**(a)**	Write a short note on generation of AM	**03**
	(b)	Give comparison of FM and AM systems.	**04**
	(c)	Explain Armstrong method of FM generation with neat diagram	**07**
		OR	
Q.3	**(a)**	Write a short note on PCM.	**03**
	(b)	Define Thermal Noise & Describe its relationship to temperature and bandwidth.	**04**
	(c)	The antenna current of an AM transmitter is 8 amperes (8A) when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percent of modulation changes to 0.8.	**07**
Q.4	**(a)**	Explain FSK with waveforms.	**03**
	(b)	What is SSB? List the methods of SSB generation and Explain Phase shift method in detail.	**04**
	(c)	A 350W carrier is amplitude modulated to a depth of 100%.calculate the total power in case of SSB technique. How much power saving(in W) is achieved for SSB compared to AM .If the depth of modulation is changed to 75% then how much power(in W) is required for transmitting the SSB Wave?	**07**

OR

Q.4	**(a)**	Explain frequency hopping.	**03**
	(b)	Derive power relation for DSB, SSB and VSB.	**04**
	(c)	Write a short note on AM Receiver.	**07**

Q.5	**(a)**	Explain PWM with Waveform	**03**
	(b)	A mixer stage has a noise figure 20 dB, and this is preceded by an amplifier that has a noise figure of 9dB and an available power gain of 15dB. Calculate the overall noise figure referred to the input	**04**
	(c)	What do you understand by image frequency and its rejection? For a receiver with IF and RF frequency of 455 KHz & 950 KHz respectively. Determine: (i) local oscillator frequency (ii) image frequency (iii) Image frequency rejection ratio. Take Q=70.	**07**

OR

Q.5	**(a)**	Write a short note on PAM	**03**
	(b)	Write a short note on Direct Sequence spread spectrum.	**04**
	(c)	Draw and Explain ASK	**07**

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