Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 160802 **Date: 29-11-2013**

Subject Name: Electronic Communication

Time: 02:30 pm to 05:00 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)** **1.** What is the difference between communication and telecommunication systems? Explain the importance and applications of communication. **04**

2. Describe the concept of bandwidth and state the bandwidth of different signals. **03**

(b) Draw the circuit diagram of high frequency transformer and derive the equation for transfer impedances. **07**

Q.2 **(a)** Explain the signal to noise ratio [SNR] of an amplifier and effect of amplification on the SNR. **07**

(b) A coil has a series resistance of 10Ω, a self capacitance of 28 pF and an inductance of 2 μH. Determine the effective inductance and effective Q-factor when coil forms part of series tuned circuits resonant at 12 MH_Z. **07**

OR

(b) Explain thermal noise resistor in series. Two resistors 5K Ω and 40 K Ω are at room temperature [290k] for a bandwidth of $150KH_Z$. Calculate thermal noise for each resistor, if two resistors are connected in series. **07**

Q.3 **(a)** Explain functions of receiver and their types. **07**

(b) Obtain the Fourier transform of cosine wave having frequency f_o and peak amplitude of unity and plots its spectrum. Refer fig (a) **07**

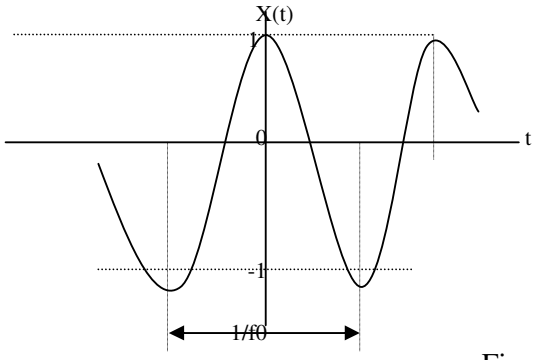

Fig. (a)

OR

Q.3 **(a)** What is signal and classify of signals. List the standard continuous Time and Discrete Time signal and explain with sketches. **07**

(b) The frequency span to be received by a receiver is from 525 KH_Z to 1650 KH_Z. If C_{min} of tuning circuit is limited to 50 pF by a trimmer of 25 pF, calculate the value of padder capacitor, if the maximum value of variable capacitor is 450 pF. The IF used is 465 KH_Z. **07**

Q.4 **(a)** Draw the AM wave forms for less than 100%, with 100%, more than 100% and with 0% modulation. Assume that the modulating signal is a pure sine wave. And compare the wave forms. How to achieve this? **07**

(b) Explain the Armstrong method of FM generation with neat diagram. **07**

OR

Q.4	**(a)**	Explain phase locked loop and vestigial side band transmissions.	**07**
	(b)	Give comparison of FM and PM systems. In FM system, the modulating frequency is $500H_Z$ and modulating voltage is 3.6 V with modulating index 65. Calculate maximum frequency deviation. What will be the modulation index when modulating frequency is 235 H_Z and modulation voltage is 5 V?	**07**
Q.5	**(a)**	What is Transponder? Explain various Transponders.	**07**
	(b)	Explain polarization of satellite signal.	**07**

OR

Q.5	**(a)**	Explain inclined orbits and its various measures of time.	**07**
	(b)	**1.** Calculate the radius of a circular orbit for which the period is 1 day. **2.** Determine which of the following years are leap year, (a) 1987 (b) 1988 (c) 2000 (d) 2100.	**07**

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