

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018****Subject Code:2151004****Date:07/12/2018****Subject Name:Electronic and 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	(a) Define Following Terms: 1.Phase Modulation 2.Modulation Index 3.Image Frequency	03
	(b) State and prove the following properties of Fourier transform. (1) Time shifting (2) Frequency shifting	04
	(c) Define communication. Draw The basic block diagram of communication system explain the function of each block.	07
Q.2	(a) What is modulation and list out the need of modulation.	03
	(b) State Parseval's theorem.	04
	(c) Draw and explain parallel tuned circuits in detail. Also derived equation for Resonance frequency and Q-factor for the parallel tuned circuits.	07
	OR	
	(c) Write a short note on self-capacitance of a coil.	07
Q.3	(a) State and prove Time-scaling property of Fourier transform.	03
	(b) An AM signal is represented by $e(t) = (10 + 4 \cos 800\pi t) \cos (2\pi \times 10^5 t)$ Find: Modulation index, and transmission Bandwidth required for this AM signal.	04
	(c) Explain Amplitude Modulation with required waveforms. Also give mathematical representation of Amplitude modulated Wave.	07
	OR	
Q.3	(a) State and prove Duality property of Fourier transform.	03
	(b) Two resistors 15 k Ω and 30 k Ω are at room temperature (290K) for a bandwidth of 300 kHz. Calculate thermal noise for each resistor, if two resistors are in series.	04
	(c) Explain Phasing method for generation a SSBSC signal in detail.	07
Q.4	(a) Give Comparison between FM and AM system.	03
	(b) With related to Amplitude modulation discuss following parameters: (I) Bandwidth requirement (II) Power distribution in sidebands and carrier.	04
	(c) Describe briefly shot noise, partition noise and flicker noise with all details.	07
	OR	
Q.4	(a) Discuss drawbacks of direct method for FM generation.	03
	(b) Draw the circuit diagram of delayed AGC. What are the advantages of delayed AGC?	04
	(c) Derive Friis formula for noise factor of cascaded amplifier.	07
Q.5	(a) Explain what double spotting is and how it arises.	03
	(b) Explain pre-emphasis and de-emphasis in relation to FM.	04

- (c) What tracking means in a superhetrodyne receiver? Explain three points tracking in radio receiver. **07**

OR

- Q.5** (a) Define the following terms related with radio receivers: (1) Selectivity (2) Fidelity (3) sensitivity **03**
- (b) Explain Phased Lock Loop with all necessary details. **04**
- (c) Draw the block diagram of Tuned Radio Frequency (TRF) Receiver and explain its operation. Describe the problems in TRF receiver. **07**

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