Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER- IV • EXAMINATION – SUMMER 2015

Subject code: X41101 Subject Name: Electronic Communication Time:10.30am-01.00pm

Date:28/05/2015

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) What is noise figure? Derive the expression for noise figure for amplifiers 07 connected in cascade.
 - (b) Explain pre-emphasis and De-emphasis.
- Q.2 (a) What is modulation? What is the need for modulation? 07
 - (b) Draw and discuss schematic diagram for FDM system that combines 4 07 voice channels each occupies a bandwidth of 8KHz. The common voice channel has a bandwidth of 32 KHz. (Band- 100 to 132 KHz).

OR

- (b) Draw only block diagram of Armstrong indirect FM transmitter and discuss 07 the nature of distortion inherent in Armstrong indirect FM generator.
- Q.3 (a) Draw the block diagram of superheterodyne receiver and explain each 07 block.
 - (b) Explain envelop detector for AM demodulation. What is the effect of small 07 value of RC time constant?

OR

- Q.3(a) Explain Tracking and Adjacent channel selectivity.07
 - (b) An audio signal $15\sin 2\pi$ (2500t) amplitude modulates a carrier 60 07 $\sin 2\pi (200,000t)$.
 - i. Sketch the audio signal & carrier.
 - ii. Construct the modulated wave.
 - iii. Determine the modulation index and percentage modulation.
 - iv. What are the frequencies of the audio signal and the carrier?

Q.4 Give comparison between following: 07 (a) FM & AM a) b) Wideband and Narrowband FM Enlist the properties of Fourier transform. Explain frequency shifting and 07 convolution properties. **(b)** OR **Q.4** (a) Find the Fourier transform of the signal: 07

- i) $\cos \omega_0 t$
- ii) $e^{-at}.u(t)$

07

Q.4	(b)	What is FM? Derive the expression for frequency modulated wave.	07
Q.5	(a)	Write a short note on self-capacitance of a coil.	07
	(b)	What is noise? Define flicker noise, shot noise and partition noise.	07

OR

- Q.5 (a) Draw the circuit diagram of capacitive tap and derive the equation for 07 transfer impedance.
 - (b) What is image frequency? An AM broadcast receiver has an IF of 465 kHz 07 and tuned to 1000 kHz and the RF stage has one tuned circuit with Q of 50. Calculate image frequency and image rejection in decibels.
