GANPAT UNIVERSITY

B.Tech. Semester -V (EC) CBCS Regular Examination, Nov-Dec 2014

Communication Engineering (2EC 505)

Max. Time: 3 Hrs.]   [Max. Marks: 70

Instructions:

1. Attempt **all** questions.
2. Answers to the **two** sections must be written in **separate** answer books.
3. Figures to the **right** indicate full marks.
4. **Assume** suitable data, if necessary.

SECTION-I

1	(A)	Define the following terms. (1) Shot noise (2) Partition noise (3) Flicker noise	6
	(B)	Discuss the following parameter for parallel tuned circuit.(1) Impedance (2) Series resonant frequency (3) Q-factor (4) Relative response	6

OR

1	(A)	Define the Q-factor, Impedance, and Impedance in terms of Q-factor and -3dB bandwidth circuit for Series tuned circuit.	6
	(B)	Find the expressions for overall noise figure and overall noise temperature of a cascaded amplifier.	6
2	(A)	Draw the block diagram of super heterodyne receiver system and explain the functions of its each sub circuit.	6
	(B)	What is modulation index of AM wave in amplitude modulation process? How can you measure modulation index using a CRO?	5

OR

2	(A)	What is a over-modulation, under modulation and perfect modulation? How can you detect an over-modulation signal?	5
	(B)	A modulating signal $10\sin(2\pi * 10^3 t)$ is used to modulate a carrier signal $20\sin(2\pi * 10^4 t)$. Determine the modulation index, percentage modulation, frequencies of the sideband components and their amplitudes. How much bandwidth will be occupied such AM signal?	6
3	(A)	Derive the expression for the DSB-SC modulation for sinusoidal carrier case.	2
	(B)	A receiver tunes signals from 550 to 1600KHz with an IF of 455 KHz. Find the frequency tuning ranges and capacitor tuning ranges for the oscillator section and for RF Section.	4
	(C)	Derive equations for total average power and effective modulation index for non-sinusoidal amplitude modulated wave.	6

SECTION II

4	(A)	Draw and explain the circuits for generating Single Side band modulation using Balanced modulators.	6
	(B)	Define following terms for FM process: 1) amplitude limiter 2) AFC 3) pre-emphasis and de-emphasis.	6

OR

4	(A)	Write down the advantages of third method over different SSB generation methods and explain it with suitable block diagram.	6
	(B)	Explain the concept of instantaneous frequency, frequency deviation, modulation index and bandwidth in an FM system.	6

5	(A)	Discuss about working of Clapp FM oscillator using a Varactor diode as frequency (angular) modulator circuit.	6
	(B)	Explain terms Apogee, Perigee, Ascending node and Angle of inclination with respect to satellite orbit.	

OR

5	(A)	Explain Equivalence between PM and FM. Also discuss benefits of Angle modulation over Analog Modulation.	6
	(B)	State and explain three laws for governance of satellite given by Kepler.	5

6	(A)	The maximum deviation allowed in a FM system is 75khz .If the modulating signal is 8khz, determine the bandwidth of FM signal. What will be the bandwidth when modulating signal amplitude is doubled?	4
	(B)	Using Carson's rule and assuming suitable data prove that FM system is sometimes referred as constant bandwidth system.	4
	(C)	Draw and explain the single sideband principles with expression and define advantage of SSB.	4

END OF PAPER