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Reg. No. :

Question Paper Code: 53405

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Electronics and Communication Engineering

15UEC305- ANALOG COMMUNICATION

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which of the following is not an Amplitude Modulator?   CO1- R

    (a) Square law modulator   (b) Product modulator

    (c) Difference Modulator   (d) Balanced modulator

2. An 80 MHz carrier is frequency modulated by a sinusoidal signal of 1V   CO2-App
    amplitude and the frequency sensitivity is 100 Hz/V. Find the
    approximate bandwidth of the FM waveform if the modulating signal has
    a frequency of 10 kHz.

    (a) 22 KHz   (b) 220 KHz   (c) 20.2 KHz   (d) 110 KHz

3. Which of the following can be termed as Quantum noise?   CO3- R

    (a) Industrial noise   (b) Thermal noise   (c) Atmospheric noise   (d) Shot noise

4. The combination of mixer and local oscillator is called   CO4- U

    (a) Filter   (b) Converter   (c) Amplifier   (d) None of the above

5. PPM and PWM can be together termed as   CO5- R

    (a) PTM   (b) PCM   (c) PAM   (d) DM

6. A 400W carrier is modulated to a depth of 75 %. Calculate the total power in the modulated wave.   CO1- App

7. Distinguish between FM and PM.   CO2-U

8. What is Weiner –Kintchine theorem?   CO3- U

9. Define pre-emphasis and de-emphasis.   CO4- U

10. What you mean by non-uniform quantization?   CO5- U

PART – C (5 x 16= 80Marks)

11. (a) (i) With necessary diagrams and expressions, derive the equation for a single tone AM signal.   CO1- U   (12)

         (ii) List the need for modulation.   CO1- U   (4)

Or

    (b) (i) Compare and contrast various Amplitude Modulation systems.   CO1- Ana   (8)

         (ii) Discuss any two methods of generating a SSB signal.   CO1- U   (8)

12. (a) (i) Discuss the indirect methods of generating a wide-band FM signal.   CO2- U   (10)

         (ii)Estimate the bandwidth of the FM signal   CO2- App   (6)
$$c(t) = 10 \cos[2 \times 10^{7} \times \pi t + 8\cos(1000 \times \pi t)]$$

Or

    (b) (i) Write about the basic principles of FM detection and explain about ratio detector.   CO2- U   (10)

         (ii) How can you generate FM from PM and PM from FM?   CO2- U   (6)

13. (a) (i) Given a random process, $X(t) = A\cos(\omega t + \theta)$ where A and ω are constants and θ is a uniform random variable from 0 to 2π. Show that X(t) is ergodic in both mean and auto correlation.   CO3-App   (12)

         (ii) State and prove any two properties of Gaussian process.   CO3- U   (4)

Or

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(b)	(i) Briefly explain about noise measurements.	CO3- U	(12)
	(ii) An amplifier operating over the frequency range from 18 to 20 MHz has a 10KΩ input resistor. What is the rms noise voltage at the input to this amplifier if the ambient temperature is 27˚C?	CO3-App	(4)

14.	(a)	With a neat block diagram, explain the operation of a Super heterodyne receiver.	CO4- U	(16)

Or

	(b)	Derive and discuss the noise performance of AM system using envelope detection.	CO4- Ana	(16)

15.	(a)	Explain the working of PCM system with block diagram.	CO5- U	(16)

Or

	(b)	Explain the generation and detection of PPM and PWM signals with necessary waveforms.	CO5- U	(16)

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