C **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 53405

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

Third Semester

Electronics and Communication Engineering

15UEC305 ANALOG COMMUNICATION

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. The bandwidth for amplitude modulated wave is CO1- R

   (a) $2f_m$ (b) $f_m/2$ (c) f_m (d) $4f_m$

2. The ratio of actual frequency deviation to the maximum allowable frequency deviation is called CO2- U

   (a) Multi tone modulation (b) Percentage modulation

   (c) Phase deviation (d) Modulation index

3. A deterministic process CO3- R

   (a) Stationary (b) Wide sense stationary

   (c) Both stationary & Wide sense stationary (d) none

4. The type of Pre-emphasis filter is: CO4- R

   (a) Low pass filter (b) High pass filter (c) Band pass filter (d) Band stop filter

5. In pulse amplitude modulation CO5- R

   (a) Amplitude of the pulse train is varied (b) Width of the pulse train is varied

   (c) Frequency of the pulse train is varied (d) None of these

PART – B (5 x 3= 15Marks)

6.	List the disadvantages of SIngle Side Band (SSB) modulation techniques.	CO1- U	
7.	Define modulation index of frequency modulation.	CO2- U	
8.	Define random variables with examples.	CO3- U	
9.	Elucidate Capture effect and threshold effect.	CO4- U	
10.	What is Nyquist rate?	CO5- U	

PART – C (5 x 16= 80Marks)

11.	(a)	(i) An audio frequency signal $10\sin 2\pi \times 500t$ is used to amplitude modulate carrier of $50\sin 2\pi \times 10^5 t$. Calculate modulation index, side band frequencies, amplitude of each side band frequencies, bandwidth required and total power delivered to the load of 600Ω.	CO1-U	(8)
		(ii) Draw an envelope detector circuit used for demodulation of AM and explain its operation.	CO1-U	(8)
		Or		
	(b)	(i) Compare the characteristics of Amplitude modulation schemes.	CO1 -Ana	(10)
		(ii) Give short note on Frequency division multiplexing.	CO2 -U	(6)
12.	(a)	Draw a phasor diagram and explain in detail about indirect method for frequency modulation transmitter.	CO2 -U	(16)
		Or		
	(b)	(i) Explain the FM discriminator with a suitable diagram.	CO2 -U	(8)
		(ii) Differentiate Narrowband and Wideband FM.	CO2 -U	(8)
13.	(a)	State and Prove the properties of Gaussian Process.	CO3- App	(16)
		Or		
	(b)	Write short notes on correlation function. State properties of autocorrelation and cross-correlation functions.	CO3- U	(16)

14.	(a)	Explain the Superheterodyne Receiver with a suitable block diagram.	CO4-U	(16)
		Or		
	(b)	(i) Explain the significance of pre-emphasis and de-emphasis in FM system.	CO4 -U	(8)
		(ii) Write about the noise performance in DSB-SC and SSB-SC systems.	CO4 -U	(8)
15.	(a)	Explain in detail about the concept of Pulse Amplitude Modulation (PAM) and also mention its advantage and its application. .	CO5- App	(16)
		Or		
	(b)	What is quantization noise? Derive the expression for signal to quantization noise ratio using uniform quantizer.	CO5- App	(16)