Q.P. Code: 16EC415 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-2021

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Generate DSB-SC signal with the help of ring modulator using diodes, with a neat sketch of waveforms.	**6M**
	b	An AM transmitter radiates 9kW of power when the carrier is un-modulated and 10.125kW of power when the carrier is sinusoidal modulated. Find the modulation index & Percentage modulation. Now if another sine wave corresponding to to 40% modulation is transmitted Simultaneously. Calculate total radiated power.	**6M**

OR

2	a	With the help of circuit diagram explain the operation of square-law diode modulator & demodulator for AM.	**6M**
	b	The total power content of AM signal is 1kW.Determine the power being transmitted at the carrier frequency and each of the sidebands when the %modulation is 100.	**6M**

UNIT-II

3	a	Explain the necessity of each block of indirect FM method.	**6M**
	b	Write short note on Pre-Emphasis and De-Emphasis circuits.	**6M**

OR

4	a	Explain the functionality of each block of phase shift discriminator.	**6M**
	b	A 107.76MHz carrier signal is frequency modulated by a 7kHz sine wave. The resultant FM signal has a frequency deviation of 50kHz. Determine carrier swing, highest & lowest frequencies of frequency modulated signal, and modulation index of FM wave.	**6M**

UNIT-III

5	a	Explain effective noise temperature and noise figure.	**6M**
	b	If each stage has a gain of 10dB and noise figure of 10dB. Calculate the overall noise figure of a two-stage cascaded amplifier.	**6M**

OR

6	a	What is meant by narrow band noise and explain time domain representation of narrow-band noise.	**6M**
	b	A radio receiver with 10KHz bandwidth has a noise figure of 30dB. Determine the signal power required at the input of receiver to achieve input SNR at 30dB.	**6M**

UNIT-IV

7	a	Sketch the spectrum of sampled signal at (i) $f_s=2f_m$; (ii) $f_s>2f_m$ and (iii) $f_s<2f_m$	**6M**
	b	Explain the frequency spectrum of Flat Top PAM signal.	**6M**

OR

8	a	State and prove sampling theorem.	**6M**
	b	What sampling rate and sampling interval would be appropriate for a television video channel with a maximum bandwidth of 4 MHz?	**6M**

UNIT-V

9	a	With a neat sketch explain Quadrature amplitude modulation technique.	6M
	b	A Discrete source emits one of 5 symbols once every millisecond. The symbol Probabilities are 1/2, 1/4, 1/8, 1/16 and 1/16. Find entropy and information rate?	6M

OR

10	a	Describe the disadvantage of Super-heterodyne AM receiver	6M
	b	A voice grade telephone channel has a bandwidth of 3400Hz.If the signal to noise ratio on the channel is 30dB; determine the capacity of the channel. If the above channel is to be used to transmit 4.8kbps of data determine minimum SNR required on the channel.	6M

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