Q.P. Code: 18EC0408

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Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations July-2022
ANALOG COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	Draw the block diagram of communication system.	L2	2M
	b	Define modulation index, carrier swing and percentage modulation of FM.	L1	2M
	c	Explain Signal to Noise Ratio.	L1	2M
	d	Explain how PPM can be generated from PWM signals.	L2	2M
	e	Explain Conditional entropy.	L4	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Explain the function of each block of communication system.	L2	5M
	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 40% modulation is transmitted Simultaneously. Calculate total radiated power.	L4	5M

OR

3	a	Generate DSB-SC signal with the help of ring modulator using diodes, with a neat sketch of waveforms.	L6	5M
	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.	L3	5M

UNIT-II

4	a	Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams.	L2	5M
	b	A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is: (i) 1 kHz (ii) 15 kHz	L2	5M

OR

5	a	Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams.	L2	5M
	b	A single-tone FM is represented by the voltage equation as: v (t) = 12cos (6×106t + 5sin 1250t) Determine the following: (i) Carrier frequency (ii) Modulating frequency (iii) Modulation index (iv) What power will this FM wave dissipate in 10Ω resistors.	L4	5M

R18

UNIT-III

6	a	Discuss about noise effect in PM and obtain expression for figure of merit.	L4	5M
	b	The noise figure of a receiver is 20dB and it is fed by a low noise amplifier which has gain of 40dB and noise temperature of 800K.Calculate the overall noise temperature of the receiving system and the noise temperature of the receiver.	L4	5M

OR

7	a	Obtain the expression for output SNR of FM system.	L1	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.	L4	4M

UNIT-IV

8	a	Explain the frequency spectrum of Flat Top PAM signal.	L2	6M
	b	Discuss about synchronization in PAM.	L4	4M

OR

9	a	With a neat sketch, explain the detection/ demodulation of Pulse Duration Modulation.	L2	5M
	b	Explain about Frequency Division Multiplexing.	L2	5M

UNIT-V

10	a	Explain Super-heterodyne FM receiver and describe the disadvantage of Super-heterodyne AM receiver.	L1	5M
	b	For a broadcast Super-heterodyne AM receiver having no RF amplifier, the loaded Quality factor of the antenna coupling circuit is 100. Now, if the intermediate frequency is 455kHz, determine the image frequency and its rejection ratio at an incoming frequency of 1000kHz.	L4	5M

OR

11	a	Draw block diagram of Super-heterodyne AM receiver and explain function of each block.	L5	5M
	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.	L4	5M

END