

CONTINUOUS INTERNAL EVALUATION- 1

Dept: EC Sem / Div: V Course: Principles of Communication Systems Course Code: 18EC53

Date: 20/10/2020 Time: 9:30-11:00 Max Marks: 50 Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

Q N	Questions	Marks	RBT	COs
PART A				
1 a	Explain the generation of DSB-SC wave using Ring Modulator.	8	L2	CO1
b	An audio frequency signal $10\sin 2\pi \cdot 500t$ is used to amplitude modulate a carrier of $50\sin 2\pi \cdot 10^5t$. Assume modulation index=0.2. Calculate 1) sideband frequencies, 2) Amplitude of each sideband frequencies, 3) Bandwidth required, 4) total power delivered to the load of 600Ω	7	L3	CO1
c	With a block diagram, explain the working of a FM stereo multiplexing	10	L2	CO2
OR				
2 a	Explain the operation of envelope detector with neat diagrams and waveforms. Bring out the significance of the RC time constant of the circuit in detection of message signal without distortion.	6	L2	CO1
b	Draw and explain the function of each section in super heterodyne receiver.	6	L2	CO2
c	Explain nonlinearity and its effect in frequency modulation system.	5	L2	CO2
d	A certain AM transmitter radiates 10KW with carrier unmodulated, and 11.8KW when the carrier is sinusoidally modulated. Calculate the modulation index. If another sine wave corresponding to 30% modulation is transmitted simultaneously, determine the total radiated power?	8	L3	CO1
PART B				
3 a	With a neat block diagram, write a note on quadrature carrier multiplexing.	6	L1	CO1
b	An angle modulated signal is defined by $s(t) = 10 \cos[2\pi \cdot 10^6t + 0.2 \sin(2000\pi t)]$. Find the following: i) Modulation index ii) Modulation frequency iii) Frequency deviation iv) Carrier frequency v) Power of the FM signal.	6	L3	CO2
c	Illustrate the time domain and frequency domain characteristics of standard Amplitude modulation produced by a single tone.	8	L2	CO1
d	Derive an expression for SSB modulated wave for which the upper side band is retained.	5	L3	CO1
OR				
4 a	Illustrate the detection of FM using non-linear model of PLL	10	L3	CO2
b	Explain how costas receivers can be used for demodulating DSB-SC signal.	6	L2	CO1
c	A sinusoidal modulating wave of amplitude 5V and frequency 1KHz is applied to a frequency modulator. The frequency sensitivity of the modulator is 50 and calculate : i) The frequency deviation ii) Modulation index.	5	L3	CO2
d	Explain the operation of the frequency division multiplexing.	4	L2	CO1