

2024

SUBJECT NAME: Principle of Communication*Full Marks : 100*

Time : Three hours

*The figures in the margin indicate full marks for the questions.**Answer any five questions.*

1.	a)	Draw a periodic and a non periodic signal.	2
	b)	Find out the time period of a signal whose frequency is 50Khz in msec.	2
	c)	Draw a sine signal.	1
	d)	For $2\sin 4\pi t$ signal peak amplitude isvolt And frequency ishz	2
	e)	Peak to peak voltate of $2\sin 2\pi t$ signal is	1
	f)	Plot the following signals in a single x-y axis	2x3=6
	i)	a) $\sin \omega t$ b) $-\sin \omega t$	
	ii)	a) 1khz sin signal b) 2khz sin signal	
	iii)	a) $\sin \omega t$ b) $2\sin \omega t$	
	g)	Define the following असतो मा सत गमय	2x3=6
	i)	a) modulation b) amplitude modulation c) frequency modulation	
2.	a)	For a A.C signal if time period is $1\mu s$ find out the frequency of the same signal in mega hertz unit.	2
	b)	Find out rms voltage and dissipated power in a 1Ω resistor if the peak is 8V.	2
	c)	Write down the mathematical function of a sine signal whose frequency is 10 hz and peak amplitude is 3V.	1
	d)	Derive the mathematical expression of a amplitude modulated signal	4
	e)	Compare AM and FM	5
	f)	Derive the mathematical expression of a frequency modulated signal.	6
3.	a)	Plot modulating signal, carrier signal, amplitude modulated signal	2
	b)	For a AM signal if modulation index is 0.5 , carrier power is 1 watt find out	2

		total power required to transmit the AM signal	
	c)	DSB-SC stands for	1
	d)	Draw the circuit diagram of a balanced modulator and derive it's voltage output to explain it's functionality.	4+6=10
	c)	PLOT the spectrum of DSB-SC signal.	1
	d)	Draw a modulating signal, carrier signal, frequency modulated signal	3
	f)	Maximum frequency deviation is proportional to frequency	1
4.	a)	Draw the block diagram of SSB generation using phase shift method and explain the same	5+5=10
	b)	Derive the total power relation of a AM signal as a function of modulation index ,carrier power.	5
	c)	Write down names of different types of propagation of waves	5
5.	a)	What are the main advantages of DSB transmission	2
	b)	Define modulation index of FM	2
	c)	Draw the block diagram of a communication system and explain each block function	6+8=14
	d)	For a FM signal maximum frequency deviation is 1khz and modulating frequency is 100hz find out modulation index	2
6.	a)	$(2+2\sin\omega t)\sin 1000*2\pi ft$ is amodulated signal	2
	b)	How does the junction capacitance of a diode is dependent on bias voltage?	4
	c)	Where do you find the application of varactor diode?	2
	d)	By changing the capacitance can we change the frequency of oscillation?	2
	e)	By changing the reactance can we change the frequency of oscillation?	2
	f)	If you increase capacitance frequency of oscillation will	1
	g)	If you increase inductance frequency of oscillation will	1
	g)	Write down the advantages of modulation	4
	h)	Maximum value of $\cos\omega t$ is	1
	i)	Minimum value of $\cos\omega t$ is	1
7.		Describe in detail with circuit diagram	10x2=20
	a)	FM generation	
	b)	AM generation	