

# University of Mumbai

Program: IT

Curriculum Scheme: Rev2019/2016(Keep the required)

Examination: SE Semester III

Course Code: \_\_\_\_\_ and Course Name: Principle of Communication

Time: 2 hour 30 minutes

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Flat top sampling of low pass signals
Option A:	Gives rise to aperture effect
Option B:	Implies over sampling
Option C:	Leads to aliasing
Option D:	Introduces delay distortion
2.	In a delta modulation system, granular noise occurs when the
Option A:	Modulating signal increases rapidly
Option B:	Pulse rate decreases
Option C:	Pulse amplitude decreases
Option D:	Modulating signal remains constant
3.	PAM signal can be detected using
Option A:	Low pass filter
Option B:	High pass filter
Option C:	Band pass filter
Option D:	All pass filter
4.	Coherent demodulation of FSK signal can be performed using
Option A:	Matched filter
Option B:	BPF and envelope detectors
Option C:	Discriminator
Option D:	None of the mentioned
5.	The use of non uniform quantization leads to
Option A:	Reduction in transmission bandwidth
Option B:	Increase in maximum SNR
Option C:	Increase in SNR for low level signals
Option D:	Simplification of quantization process
6.	Which of the following requires a synchronizing signal?
Option A:	Single channel PPM system
Option B:	PAM
Option C:	DM
Option D:	All of the mentioned
7.	A PWM signal can be generated by
Option A:	An astable multi vibrator

Option B:	A monostable multi vibrator
Option C:	Integrating a PPM signal
Option D:	Differentiating a PPM signal
8.	In an ideal TDM system, the cross correlation between two users of the system is
Option A:	1
Option B:	0
Option C:	Infinity
Option D:	-1
9.	TDM requires
Option A:	Constant data transmission
Option B:	Transmission of data samples
Option C:	Transmission of data at random
Option D:	Transmission of data of only one measured
10.	Properties used to determine stream's fidelity
Option A:	Sampling rate
Option B:	Bit depth
Option C:	Sampling rate & Bit depth
Option D:	None of the mentioned

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Explain need of modulation. Justify it with example.	
B	Define the following terms. i) . Noise figure ii). Noise temperature iii). Noise bandwidth iv) Noise voltage v) Modulation	
C	Compare AM and FM.	
D	Explain in short pre-emphasis and De-emphasis.	
E	What is PSK signal. Draw the PSK signal for the following binary signal 111010011	
F	Explain the principle of reflection and refraction.	

<b>Q3</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Define signal to noise ratio. Explain the effect of cascade connection on a signal to noise ratio. Derive Friss formula for two stage cascade amplifier.	
B	State and prove the following properties of Fourier transform with example i) Convolution in time domain ii) Time scaling	
C	The AM Transmitter develops an unmodulated power o/p of 400 Watts across a 50 $\Omega$ resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of 0.8. Assuming $f_m = 5\text{KHz}$ and $f_c = 1\text{MHz}$ . [10] (i) Obtain the value of carrier amplitude $V_c$ and hence write the expression for AM signal.	

	(ii) Find the total sideband power. (iii) Draw the AM wave for the given modulation index.
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<b>Q4</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	State Sampling theorem, write down the steps to prove sampling theorem, draw waveform for low pass band limited signal.	
B	Draw the block diagram of PWM generator and detector. Explain the working giving waveforms at the output of each block.	
C	Explain the generation and detection of FSK signal.	