

**University of Mumbai**  
**Examination 2020 under cluster 7(Lead College: SSJCOE)**

Examinations Commencing from 15<sup>th</sup> June 2021 to 24<sup>th</sup> June 2021

Program: **Information Technology**

Curriculum Scheme: Rev2019

Examination: SE Semester-III

Course Code: ITC 304 and Course Name: Principle of Communication

Time: 2 hour

Max. Marks: 80

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<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	What is the upper frequency of a signal with a bandwidth of 10MHz, if the lower frequency limit is 54MHz?
Option A:	64MHz
Option B:	48MHz
Option C:	84MHz
Option D:	48Hz
2.	Which one of the following channels has higher data rates as compared to the other wired communication channels?
Option A:	Coaxial cable channel
Option B:	Shielded Twisted pair cable channel
Option C:	Optical fiber channel
Option D:	Unshielded Twisted pair cable channel
3.	Which one of the following is not the Analog modulation system?
Option A:	PAM
Option B:	FM
Option C:	PWM
Option D:	PCM
4.	An amplifier has a noise figure of 3 dB. What is its equivalent temperature?
Option A:	600 <sup>0</sup> K
Option B:	300 <sup>0</sup> K
Option C:	400 <sup>0</sup> K
Option D:	500 <sup>0</sup> K
5.	The expression for the rms value of the thermal noise voltage is-----
Option A:	kTB
Option B:	Sqrt(4kTBR)
Option C:	4kTB
Option D:	4kTRB
6.	Which one of the following is one of the types of Internal Noise?
Option A:	Atmospheric Noise

Option B:	Industrial Noise
Option C:	Extraterrestrial Noise
Option D:	Thermal Noise
7.	A broadcast radio transmitter radiates 5kW power when the modulation percentage is 60%. What is the carrier power?
Option A:	10.75kW
Option B:	4.237kW
Option C:	1kW
Option D:	8kW
8.	The modulation index of AM is defined as---
Option A:	The ratio of amplitudes of the modulating and carrier wave
Option B:	The ratio of amplitudes of the carrier and modulating wave
Option C:	The ratio of frequencies of the modulating and carrier wave
Option D:	The ratio of frequencies of the carrier and modulating wave
9.	The Intermediate Frequency of the Super Heterodyne receiver is..... [Where $f_o$ is the Local oscillator frequency and $f_s$ is the RF amplifier frequency)
Option A:	$f_o - f_s$
Option B:	$f_s \times f_o$
Option C:	$f_s + f_o$
Option D:	$f_o / f_s$
10.	The artificial boosting of higher modulating frequencies is called as.....
Option A:	De-emphasis
Option B:	Pre-emphasis
Option C:	Diagonal clipping
Option D:	Negative peak clipping
11.	A carrier is frequency modulated with a sinusoidal signal of 2kHz resulting in a maximum frequency deviation of 5 kHz. Find the bandwidth of the modulated signal.
Option A:	10 kHz
Option B:	20 kHz
Option C:	14 kHz
Option D:	28 kHz.
12.	The frequency deviation of FM is.....
Option A:	$m_f \times f_m$
Option B:	$f_c + f_m$
Option C:	$m_f / f_m$
Option D:	$f_c / f_m$
13.	Aliasing error occurs when.....
Option A:	$f_s = 2f_m$
Option B:	$f_s = 4f_m$
Option C:	$f_s < 2f_m$
Option D:	$f_s > 2f_m$

14.	The Step size varies in one of the following modulation systems.
Option A:	Pulse Code Modulation
Option B:	Delta Modulation
Option C:	Adaptive Delta Modulation
Option D:	Pulse Amplitude Modulation
15.	Which one of the following is not the essential operation in PCM transmitter?
Option A:	Sampling
Option B:	Quantizing
Option C:	Encoding
Option D:	Decoding
16.	The Inter symbol interference and its effects on various communication systems are studied by using.....
Option A:	Modulator
Option B:	Demodulator
Option C:	Comparator
Option D:	Eye Pattern
17.	The cross talk is severe in one of the following techniques
Option A:	Frequency Division Multiplexing
Option B:	Time Division Multiplexing
Option C:	Amplitude Modulation
Option D:	Pulse Amplitude Modulation.
18.	Noise immunity is low in one of the following modulation techniques
Option A:	BASK
Option B:	BPSK
Option C:	BFSK
Option D:	QPSK
19.	The redistribution or modulation of energy within a wave front, when it passes near the edges of an opaque object is defined as.....
Option A:	Reflection
Option B:	Refraction
Option C:	Diffraction
Option D:	Interference
20.	In which of the following propagation, the waves travel along the surface of the earth?
Option A:	Sky Wave Propagation
Option B:	Space Wave Propagation
Option C:	Ground Wave Propagation
Option D:	Tropospheric Scatter Propagation

<b>Q2.</b> (20 Marks)	<b>Solve any Two Questions out of Three 10 marks each</b>
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A	Derive the expression for Friss formula for two stage cascade Amplifier. For three cascaded amplifier stages, each with noise figure of 3 dB and power gain of 10dB, determine the overall noise figure.
B	Derive the mathematical expression for Amplitude modulation and also draw the waveforms for $m < 1$ , $m > 1$ and $m = 1$ .
C	Explain the generation of PPM signal with neat block diagram and also compare PPM with PAM and PWM.

<b>Q3.</b> <b>(20 Marks)</b>	<b>Solve any Two Questions out of Three 10 marks each</b>
A	Draw and explain the Foster seeley discriminator with neat diagram.
B	Explain BASK Generation and Detection with neat block diagram and waveforms.
C	Explain the principle of Sky wave propagation and its layers and also explain Virtual height.

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<b>Question Number</b>	<b>Correct Option</b>
Q1.	A
Q2.	C
Q3.	D
Q4	B
Q5	B
Q6	D
Q7	B
Q8.	A
Q9.	A
Q10.	B
Q11.	C
Q12.	A
Q13.	C
Q14.	C
Q15.	D
Q16.	D
Q17.	A
Q18.	A
Q19.	C
Q20.	C