University of Mumbai

Examination 2021 under cluster 7(Lead College: SSJCOE)

Examination Commencing from 15th June 2021 to 24th June 2021

Program: **Information Technology**

Curriculum Scheme: Rev2019

Examination: SE Semester III (DSE)

Course Code: ITC304 and Course Name: Principle of Communication

Time: 2 hour Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
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 of the following has a minimum wavelength?
Option A:	Gamma rays
Option B:	Blue light
Option C:	Infrared rays
Option D:	Microwave
3.	Medium which sends information from source to receiver is called
Option A:	Transmitter
Option B:	Transducer
Option C:	Loudspeaker
Option D:	Channel
4.	What is the wavelength of a signal with a frequency of 150MHz?
Option A:	10m
Option B:	2m
Option C:	5m
Option D:	20m
5.	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
6.	Thermal noise is also called as
Option A:	Johnson Noise
Option B:	Partition Noise
Option C:	Flicker Noise
Option D:	Solar Noise

7.	Which 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
8.	Periodic signal is……
Option A:	The signals which change with time
Option B:	The signals which change with frequency
Option C:	The signals that repeat itself over a fixed frequency
Option D:	The signal that repeats itself in time
9.	An amplifier has a noise figure of 10 dB. What is the Noise Factor?
Option A:	1
Option B:	10
Option C:	100
Option D:	1000
10.	White noise has _____ power spectral density.
Option A:	Constant
Option B:	Variable
Option C:	Flickering
Option D:	Fluctuating
11.	Which one of the following is not the Analog modulation system?
Option A:	PAM
Option B:	FM
Option C:	PWM
Option D:	PCM
12.	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
13.	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
14.	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_sxf_o
Option C:	f_s+f_o
Option D:	f_o/f_s

15.	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
16.	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.
17.	The frequency deviation of FM is……
Option A:	m_f x f_m
Option B:	f_c+f_m
Option C:	m_f / f_m
Option D:	f_c / f_m
18.	The Bandwidth of DSBFC AM is…….
Option A:	$4f_m$
Option B:	$2f_m$
Option C:	$3f_m$
Option D:	f_m
19.	The Intermediate frequency used for AM receiver is…..
Option A:	455 MHz
Option B:	455 KHz
Option C:	455 Hz
Option D:	905 KHz
20.	The ability of a receiver to reject unwanted signal is called……..
Option A:	Fidelity
Option B:	Amplification
Option C:	Selectivity
Option D:	Sensitivity

Q2 **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	(i) Derive the Friiss formula. (ii) For three cascaded amplifier stages, each with noise figure of 3 dB and power gain of 10 dB, determine the overall noise figure(in dB).
B	(i) Derive the expression of AM.

	(ii) A sinusoidal carrier has amplitude of 10V and a frequency of 100 kHz. It is amplitude modulated by a sinusoidal voltage of amplitude 3V and frequency 500 Hz. Modulated voltage is developed across 75 Ohms resistance. Write the equation for the modulated wave.
C	Explain the working of Ratio detector and compare its performance with Foster Seeley Discriminator.

Q3 **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	State and prove the time shifting property and frequency shifting property of the Fourier Transform.
B	Explain Super heterodyne receiver with neat block diagram and compare its performance with TRF receiver.
C	A 25 MHz carrier is modulated by a 400 Hz audio sine wave. If the carrier voltage is 4V and maximum deviation is 10 KHz. Write the equation of modulated wave for FM. If the modulating frequency is now changed to 2 KHz, all else remaining constant , derive the new equation for FM.

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