K. J. Somaiya Institute of Engineering and Information Technology
Sion, Mumbai - 400022
NAAC Accredited Institute with 'A' Grade
NBA Accredited 3 Programs
(Computer Engineering, Electronics & Telecommunication Engineering and Electronics Engineering)
Permanently Affiliated to University of Mumbai

EXAMINATION TIME TABLE (JANUARY 2021)

PROGRAMME - T.E. (Electronics & Telecommunication) (REV. -2012)(CBSGS)

SEMESTER - V

Days and Dates	Time	Course Code	Paper
Thursday, January 7, 2021	3.30 p.m to 5.30 p.m	ETC501	MICROCONTROLLERS AND APPLICATIONS
Saturday, January 9, 2021	3.30 p.m to 5.30 p.m	ETC502	ANALOG COMMUNICATION
Tuesday, January 12, 2021	3.30 p.m to 5.30 p.m	ETC503	RANDOM SIGNAL ANALYSIS
Thursday, January 14, 2021	3.30 p.m to 5.30 p.m	ETC504	R F MODELING AND ANTENNAS
Saturday, January 16, 2021	3.30 p.m to 5.30 p.m	ETC505	INTEGRATED CIRCUITS

Important Note: ● **Change if any, in the time table shall be communicated on the college web site.**

PRINCIPAL

Mumbai
20th December 2020

University of Mumbai
Examination 2020 under cluster 5 (Lead College: APSIT)

Program: Electronics and Telecommunication Engineering
Curriculum Scheme: Rev 2012
Examination: Third Year Semester V
Course Code: ETC501 and Course Name: Microcontrollers and Applications
Time: 2 hour Max. Marks: 80

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Q1. **(40 Marks)**	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which port of 8051 has lower order Address and Data bus multiplexed?
Option A:	Port0
Option B:	Port1
Option C:	Port2
Option D:	Port3
2.	In 8051, the maximum of _____ size of ROM can be connected externally.
Option A:	4 kilobytes
Option B:	256 bytes
Option C:	128 bytes
Option D:	64 kilobytes
3.	In 8051, which register usually stores the output generated by ALU in several arithmetic and logical operations?
Option A:	Accumulator
Option B:	Special Function Register
Option C:	Timer Register
Option D:	Stack Pointer
4.	Which of the following is not an interrupt of 8051?
Option A:	NMI- (Hardware Interrupt)
Option B:	External Interrupt 0 (INT0)
Option C:	Timer interrupt 0(TF0)
Option D:	Serial communication (RI + TI)
5.	UART in 8051 is
Option A:	Hardware interrupt
Option B:	data transmission protocol
Option C:	allow user to interface input/output devices
Option D:	Universal Arithmetic Receiver and transmitter
6.	In 8051, which instruction is of Direct Addressing mode?
Option A:	MOV R0,40H
Option B:	MOV A,R0
Option C:	MOV A,@R0

Option D:	MOV A,#30H
7.	In 8051, find the content of A for the following instructions MOV A,#0FFH ADD A ,#01H
Option A:	01H
Option B:	11H
Option C:	10H
Option D:	00H
8.	In 8051, which instruction is used to make P1 As input port?
Option A:	MOV P1,#0FFH
Option B:	MOV P1,@0FFH
Option C:	MOV P1,#00H
Option D:	MOV P1,0FFH
9.	What is the function of the WR pin in IC ADC0804?
Option A:	its active high input used to inform ADC0804 to the end of conversion
Option B:	its active low input used to inform ADC0804 to the end of conversion
Option C:	its active low input used to inform ADC0804 to the start of conversion
Option D:	its active high input used to inform ADC0804 to the start of conversion
10.	LCD use ___pin to latch information to its data pins
Option A:	RS
Option B:	E
Option C:	R/W
Option D:	VEE
11.	Which flag is not there in ARM-7
Option A:	Zero
Option B:	Carry
Option C:	Overflow
Option D:	Auxiliary Carry
12.	What is function of instruction LDR R0, [R1], #4 in ARM 7?
Option A:	Content of address stored in register R1 is incremented by 4 and transferred to register R0.
Option B:	Content of address stored in register R1 is transferred to register R0 and content of address is incremented by 4.
Option C:	Content of address stored in register R1 is transferred to register R0 and address incremented by 4.
Option D:	Address stored in register R1 is incremented by 4 and content of new address is transferred to register R1.
13.	What is a function of instruction MOV R0, R1, LSL#4 in ARM 7?
Option A:	Content of register R1 is transferred to R0.
Option B:	Content of register R1 is multiplied by 4 and transferred to register R0.
Option C:	Content of register R1 is multiplied by 8 and transferred to R0.
Option D:	Content of register R1 is multiplied by 16 and transferred to register R0.

14.	What does T, D, M, I stand for in ARM7TDMI?
Option A:	Thumb, Debug, Multiplier, ICE
Option B:	Timer, Debug, Multiplex, ICE
Option C:	Timer, Debug, Modulation, IS
Option D:	Thumb, Debug, Modulation, ICE
15.	Which of the following is not a feature of ARM processors?
Option A:	Pipeline
Option B:	Symmetrical register file
Option C:	One cycle execution
Option D:	Variable size of instructions
16.	Which of the following processor mode is not supported by ARM7
Option A:	Abort
Option B:	FIQ
Option C:	IRQ
Option D:	Super Fast
17.	LDR instruction in ARM7 is used to
Option A:	Load word into register
Option B:	Load next address of instruction in PC register
Option C:	Load next address of instruction in SP register
Option D:	Load next address of instruction in DPTR register
18.	The address of the software interrupt in interrupt vector table of ARM7 is
Option A:	0X00000000
Option B:	0X00000004
Option C:	0X00000008
Option D:	0X0000000C
19.	BIC r0,r1,r2 instruction is used to perform below operation.
Option A:	r0=r1 AND (NOT r2)
Option B:	r0=r1 AND r2
Option C:	r0=r1 AND (NOT r1)
Option D:	r0=r1 AND (NOR r2)
20.	Which of the following is NOT a common characteristic of embedded systems?
Option A:	Multi- Functioned
Option B:	Tightly constrained
Option C:	Reactive
Option D:	Real time

Q2. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Design a microcontroller system using 8051 microcontroller, 8kB EPROM & 8kB RAM.
B	WAP for 8051 microcontroller to generate a square waveform of frequency 1kHz and 50% duty cycle at pin P1.1. Assume 8051 is operating at frequency 12MHz.

C	Draw and explain the data flow model of ARM7.

Q3. **(20 Marks Each)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain PORT 1 structure of 8051.
B	Explain register organization of ARM7.
C	Explain digital camera as an example of embedded systems.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2012

Examination: Third Year Semester V

Course Code: ETC501 and Course Name: Microcontrollers and Applications

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev2012

Examination: TE Semester V

Course Code: ETC502 and Course Name: Analog communication

Time: 2 hour 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.	Thermal noise is also called
Option A:	Atmospheric noise
Option B:	Internal noise
Option C:	Receiver noise
Option D:	Johnson noise
2.	What special circuit is used to generate a Double sideband suppressed carrier signal?
Option A:	Sideband suppressor
Option B:	Anti-modulator
Option C:	Balanced modulator
Option D:	Carrier suppressor
3.	Two sinusoidal signals are simultaneously modulating a carrier, the modulation indices being 0.3 and 0.4. The overall modulation index is
Option A:	0.5
Option B:	0.1
Option C:	0.7
Option D:	0.12
4.	In a diode detector circuit, if the ac load for the diode is very much smaller than the dc load, it can result in
Option A:	poor sensitivity of the receiver
Option B:	poor AGC
Option C:	diagonal clipping
Option D:	negative peak clipping
5.	An AM transmitter of 1 kW power is fully modulated. Calculate the power transmitted, if it is transmitted as SSB.
Option A:	1KW
Option B:	0.166KW
Option C:	0.28KW
Option D:	0.5KW
6.	What is the reference line of the modulating signal?
Option A:	Zero Line

Option B:	Carrier peak line
Option C:	Modulated peak line
Option D:	Unmodulated peak line
7.	If the deviation is 75KHZ and the maximum modulating frequency is 5KHZ, what is the bandwidth of an FM wave?
Option A:	80KHZ
Option B:	160KHZ
Option C:	40KHZ
Option D:	320KHZ
8.	With increase in the modulation index of an FM wave the number of sidebands having significant amplitude will
Option A:	Increase
Option B:	decrease
Option C:	Remain constant
Option D:	will get divided by 2
9.	To produce frequency modulation using a phase modulator
Option A:	the message signal must be integrated and then used for modulation
Option B:	the message signal must be differentiated and then used for modulation
Option C:	the phase-modulated signal must be integrated
Option D:	the phase-modulated signal must be differentiated
10.	In frequency modulation by a single-tone modulating signal, the frequency deviation constant and the modulating signal frequency are both doubled. The modulation index will be
Option A:	Quadrupled
Option B:	unchanged
Option C:	doubled
Option D:	0.25 times the previous value
11.	Pre-Emphasis Circuit is used to amplify what kind of frequencies?
Option A:	Low
Option B:	High
Option C:	Moderate
Option D:	Oscillator
12.	The transmitted power in an FM system is
Option A:	Dependent on the number of sidebands
Option B:	Always constant
Option C:	Dependent on the carrier power and sidebands
Option D:	Dependent on Modulation index
13.	What is Fidelity?
Option A:	Ability of receiver to select wanted signal from various incoming signal
Option B:	Minimum magnitude of input signal required to produced a specified output
Option C:	Ability to amplify weak signals
Option D:	Equally amplifies all the signal frequencies at receiver

14.	The standard intermediate frequency used in the superheterodyne FM receiver is
Option A:	88 MHz
Option B:	455 MHz
Option C:	15 MHz
Option D:	10.7 MHz
15.	A superheterodyne AM broadcast receiver has an IF of 455 kHz. If it is tuned to a frequency of 700 kHz, the image frequency is
Option A:	1610 kHz
Option B:	1155 kHz
Option C:	245 kHz
Option D:	210 kHz.
16.	A high value of IF for a superheterodyne receiver
Option A:	improves image frequency rejection
Option B:	improves the selectivity
Option C:	improves the sensitivity
Option D:	improves the fidelity
17.	The Nyquist rate for a signal X(t)=5cos(2∏X500t) is _____
Option A:	1200HZ
Option B:	1000HZ
Option C:	2000HZ
Option D:	1500HZ
18.	A PAM signal may be generated using
Option A:	impulse sampling
Option B:	a sample-and-hold circuit
Option C:	natural sampling
Option D:	A clipper circuit
19.	The PAM noise immunity is poor as
Option A:	It is the Pulsed form
Option B:	It is bipolar signal
Option C:	It is unipolar signal
Option D:	The information is contained in the amplitude variation
20.	The signal power and noise power measured at the input of an amplifier are 150µW and 1.5µW respectively. If the signal power at the output 1.5W and noise power is 40mW, Calculate the amplifier noise factor.
Option A:	2.666
Option B:	4.26
Option C:	3.66
Option D:	4

Q2 (20 Marks)	**Solve any Four out of Six** **5 marks each**
A	Explain the need of modulation in communication system

B	What is pre emphasis? Why is it used? Sketch and explain pre emphasis circuit.
C	Why is IF selected as 455KHZ in AM?
D	What is aliasing? How can it be prevented ?
E	Explain companding in detail
F	Explain double spotting with respect to radio receiver

Q3. **(20 Marks Each)**	
A	**Solve any Two** **5 marks each**
i.	It is found that a radio transmitter is radiating a total power of 100 kW. When the modulation index is 0.8, what is the carrier power radiated by the transmitter? What is the sideband power?
ii.	Why is AGC required in receivers? Differentiate between simple and delayed AGC.
iii.	With the help of a suitable diagram explain generation of PWM signal.
B	**Solve any One** **10 marks each**
i.	What are different methods of FM generation? Draw circuit diagram and explain the principle of reactance modulator.
ii.	State and prove sampling theorem for pass band signal.

University of Mumbai

Examination 2020 under cluster 5 (Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Re2012

Examination: TE Semester V

Course Code: ETC502and Course Name: Analog communication

Time: 2 hour Max. Marks: 80

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

University of Mumbai
Examination 2020

Program: EXTC

Curriculum Scheme: Rev-2012

Examination: TE Semester -V

Course Code: ETC 503 and Course Name: Random Signal Analysis

Time: 2 hour 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.	What is the probability of an impossible event?
Option A:	0
Option B:	1
Option C:	0.47
Option D:	0.65
2.	If f(x)=k(1+x) , 2≤x≤5 ,Find P(X<4)
Option A:	16/27
Option B:	17/32
Option C:	16/40
Option D:	22/35
3.	A continuous random variable X has pdf defined by f(x)=A+Bx ,0≤x≤1.If the mean of the distribution is 1/3 .Find A and B.
Option A:	A=1 B=3
Option B:	A=4 B=9
Option C:	A=8 B=5
Option D:	A=2 B= -2
4.	If P(x) = 0.5 and x = 4, then E(x) =?
Option A:	1
Option B:	0.5
Option C:	4
Option D:	2
5.	If 'X' is a random variable, taking values 'x', probability of success and failure being 'p' and 'q' respectively and 'n' trials being conducted, then what is the probability that 'X' takes values 'x'? Use Binomial Distribution
Option A:	$P(X = x) = {}^{n}C_{x}\, p^{x}\, q^{x}$
Option B:	$P(X = x) = {}^{n}C_{x}\, p^{x}\, q^{(n-x)}$
Option C:	$P(X=x) = {}^{x}C_{n}\, q^{x}\, p^{(n-x)}$
Option D:	$P(x = x) = {}^{x}C_{n}\, p^{n}\, q^{x}$
6.	In a discrete probability distribution, the sum of all probabilities is always?
Option A:	0
Option B:	Infinite
Option C:	1
Option D:	0.78
7.	E(X) = np is for which distribution?
Option A:	Bernoulli's
Option B:	Binomial
Option C:	Poisson's
Option D:	Normal

8.	Find the value of k if $f(x, y) = k(1-x)(1-y)$ for$0 < x, y < 1$ is to be joint density function
Option A:	3
Option B:	9
Option C:	7
Option D:	4
9.	What does the central limit theorem state?
Option A:	If the sample size increases sampling distribution must approach normal distribution
Option B:	If the sample size decreases then the sample distribution must approach normal distribution
Option C:	If the sample size increases then the sampling distribution much approach an exponential distribution
Option D:	If the sample size decreases then the sampling distribution much approach an exponential distribution
10.	A random sample of size 100 is taken from a population whose mean is 60 and the variance is 400.Using central limit theorem with what probability can we assert that the mean of the sample will not differ from μ=60 by more than 4?
Option A:	0.9544
Option B:	0.77
Option C:	0.45
Option D:	0.33
11.	Autocorrelation function
Option A:	is an even function of τ
Option B:	is an odd function of τ
Option C:	may be an even or odd function of τ
Option D:	is both an odd and even function of τ
12.	Stochastic process are
Option A:	Random in nature
Option B:	Are function of time
Option C:	Random in nature and are a function of time
Option D:	Not Random in nature and are not a function of time
13.	A random process is given by $X(t) = A\cos(w_o t+\Theta)$ where A and w_o are constants and Θ is uniformly distributed over (0,Π).The average power of process is
Option A:	$A^3/2$
Option B:	$A^2/2$
Option C:	A/2
Option D:	A/7
14.	In Markov analysis, we are concerned with the probability that the
Option A:	state is part of a system
Option B:	system is in a particular state at a given time
Option C:	time has reached a steady state
Option D:	transition will occur
15.	The first order Markov chain is generally used when
Option A:	random change in transition probabilities
Option B:	stable transition probabilities
Option C:	sufficient data
Option D:	no sufficient data
16.	Most systems use a queue discipline known as
Option A:	longest processing time
Option B:	shortest processing time
Option C:	critical ratio
Option D:	FIFO
17.	If the probability of hitting the target is 0.4, find mean and variance.

Option A:	0.6, 0.24
Option B:	0.4, 0.24
Option C:	0.4, 0.16
Option D:	0.6, 0.16
18.	Two unbiased coins are tossed. What is the probability of getting at most one head?
Option A:	½
Option B:	1/3
Option C:	1/6
Option D:	¾
19.	If the mean of population is 29 then the mean of sampling distribution is _____
Option A:	29
Option B:	30
Option C:	21
Option D:	31
20.	A random variable X can take only two values, 2 and 4 i.e., P(2) = 0.45 and P(4) = 0.97. What is the Expected value of X?
Option A:	3.8
Option B:	2.9
Option C:	4.78
Option D:	5.32

Q2	Solve any Four out of Six Questions (5 marks each)
A	The joint probability density function of (X,Y) is given by $f(x,y)= k\, e^{-(x+y)}$,$x\geq 0, y\geq 0$ Find k, Marginal probability densities of X,Y
B	Write note on Markov Chain
C	State and prove any two properties of power spectral density function
D	Find mean and variance of Binomial distribution
E	State Central Limit Theorem and explain its significance
F	Explain Axiomatic definition of probability.

Q3.	**Solve any Two out of Three Questions (10 marks each)**
A	State and Prove Chapman-Kolmogorove equation
B	Find the autocorrelation function of a random process given by X(t)=a cos(bt+Y)where a ,b are constants and Y is uniform random variable on (-Π,Π).
C	A random process is defined by $X(t)=A\cos(w_0 t+\Theta)$where A and w_0 are constants and Θ is a random variable uniformly distributed over(0,2Π).Show that process is ergodic in mean and also in correlation.

University of Mumbai
Examination 2020

Program: **EXTC**

Curriculum Scheme: Rev-2012

Examination: TE Semester -V

Course Code: ETC 503 and Course Name: Random Signal Analysis

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster 5 (Lead College:APSIT)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program:EXTC

Curriculum Scheme: 2012

Examination: TESemester V

Course Code:ETC504 and Course Name: RF Modelling and Antennas

Time: 2 hour Max. Marks: 80

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Q61	What is the value of 'm' for designing matching sections of a composite filter?
Option A:	m < 0.6
Option B:	m > 0.6
Option C:	m ≠ 0.6
Option D:	m = 0.6
Q2	Richard's transformation is used to convert
Option A:	Lumped element to a transmission line
Option B:	Transmission line to Lumped element
Option C:	Low pass filter to high pass filter
Option D:	High pass filter to low pass filter
Q3.	Arrange the sequence for designing filters using Loss insertion method. Steps – (i) Design low pass prototype (ii) Consider filter specifications (iii) Scaling and filter transformation for given requirements
Option A:	(i),(ii),(iii)
Option B:	(iii),(ii),(i)
Option C:	(ii),(iii),(i)
Option D:	(ii),(i),(iii)
Q4.	A mathematical function or a graphical representation of the radiation properties of the antenna as a function of space coordinates is known as _____
Option A:	Radiation pattern
Option B:	Power pattern
Option C:	FNBW
Option D:	HPBW
Q5.	The Far field is also known as _____
Option A:	Fresnel zone
Option B:	Fraunhofer zone
Option C:	Maxwell zone
Option D:	Marconi zone
Q6.	The power radiated from an antenna per unit solid angle is called as _____
Option A:	Radiation intensity

Option B:	Beamwidth
Option C:	First-null beam width
Option D:	HPBW
Q7.	A _____ is a device that converts a guided electromagnetic wave on a transmission line into a plane wave propagating in free space
Option A:	Transmitting antenna
Option B:	Receiving antenna
Option C:	Radar
Option D:	Mixer
Q8.	_____ antennas consist of a regular arrangement of number of antenna elements with a feed Network.
Option A:	Aperture antennas
Option B:	Array antennas
Option C:	Printed antennas
Option D:	Patch antennas
Q9.	If the distance from the antenna increases by 2 times, then its radiation density will _____
Option A:	Increase by 2 times
Option B:	Increase by 4 times
Option C:	Decrease by 2 times
Option D:	Decrease by 4 times
Q10.	Dipole antennas are the example of _____
Option A:	Wire antennas
Option B:	Aperture antennas
Option C:	Array antennas
Option D:	Parabolic antennas
Q11.	As the beam area of an antenna decreases, the directivity of the antenna;
Option A:	Decreases
Option B:	Increases
Option C:	Remains unchanged
Option D:	Depends on the type of the antenna
Q12.	_____ antenna consist of a flaring metal waveguide to direct radio waves in a beam
Option A:	Wire antenna
Option B:	Loop antenna
Option C:	Helical antenna
Option D:	Horn antenna

Q13.	What is the beam width for a half wave dipole antenna?
Option A:	90°
Option B:	180°
Option C:	50°
Option D:	250°
Q14.	Directivity and input impedance of a monopole antenna on a large ground plane as compared to that of dipole antenna are:
Option A:	Twice & Twice
Option B:	Twice & Half
Option C:	Half & Half
Option D:	Half & Twice
Q15.	For broadside linear array, excitation phase is
Option A:	$\alpha = -\beta d$
Option B:	$\alpha = \beta d$
Option C:	Zero
Option D:	90^0
Q16.	In order to increase the gain of the Yagi-Uda array, which elements can be added to structure?
Option A:	Directors
Option B:	Reflectors
Option C:	Monopoles
Option D:	Isolators
Q17.	List out the features of loop antenna
Option A:	Expensive, difficult design
Option B:	Small in size, can replace any antenna
Option C:	Inexpensive, simple design, very versatile
Option D:	Large in size, implementation difficult and expensive
Q18.	The mode of propagation in a microstrip line is:
Option A:	Quasi TEM mode
Option B:	TE 11 mode
Option C:	Only TM mode
Option D:	TE 01 mode
Q19.	The symmetrical point on the parabolic surface is known as the _____
Option A:	Index
Option B:	Vertex
Option C:	Reflector
Option D:	Mirror
Q20.	_____ is known as a single directive antenna.

Option A:	Corner director
Option B:	Corner dipole
Option C:	Corner reflector
Option D:	Yagi antenna

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	*Explain with equivalent circuits the RF behaviour of resistor, capacitor and inductor.*
B	*Define and derive AC parameters for BJT and FET.*
C	*Explain filter design steps for Low pass filter design using image parameter method.*

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	*Derive the relation for near field and far field radiation for infinitesimal dipole.*
B	*Explain the principle of pattern multiplication.*
C	*Explain working of microstrip antenna with special attention on various types of feeds.*

University of Mumbai

Examination 2020 under cluster 5 (Lead College:APSIT)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program:EXTC

Curriculum Scheme: 2012

Examination: TESemester V

Course Code:ETC504 and Course Name: RF Modelling and Antennas

Time: 2 hour Max. Marks: 80

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1	D
Q2	A
Q3.	D
Q4.	A
Q5.	B
Q6.	A
Q7.	A
Q8.	B
Q9.	D
Q10.	A
Q11.	B
Q12.	D
Q13.	A
Q14.	B
Q15.	C
Q16.	A

Q17.	C
Q18.	A
Q19.	B
Q20.	C

University of Mumbai

Examination 2020 under cluster 5 Lead College: APSIT

Examinations Commencing from 7th January 2021 to 20th January 2021

Program:BE Electronics & Telecommunication Engineering

Curriculum Scheme: Rev 2012

Examination: TE Semester V

Course Code: ETC505 and Course Name: Integrated Circuits

Time: 2 Hours Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which circuit converts irregularly shaped waveforms to regular shaped waveforms?
Option A:	Schmitt trigger
Option B:	Voltage limiter
Option C:	Precision Rectifier
Option D:	Peak detector
2.	In a voltage to frequency converter
Option A:	The output voltage is proportional to input current.
Option B:	The output frequency is proportional to input voltage.
Option C:	The output voltage is proportional to input frequency.
Option D:	The output current is proportional to input voltage.
3.	An ideal operational amplifier has
Option A:	infinite output impedance
Option B:	zero input impedance
Option C:	infinite bandwidth
Option D:	Zero gain
4.	Which among the following is a non-linear application of op-amp?
Option A:	V to I converter
Option B:	V to F converter
Option C:	Precision rectifier
Option D:	Instrumentation amplifier
5.	Which one of the following is popular power audio amplifier IC
Option A:	NE 566
Option B:	7905
Option C:	IC 723
Option D:	LM 380
6.	An ideal second order active band reject filter has two cut off frequencies f_L and f_H where $f_L < f_H$
Option A:	It passes frequencies above f_L and rejects frequencies below f_H
Option B:	It passes frequencies above f_H and rejects frequencies below f_L
Option C:	It passes frequencies above f_H and below f_L
Option D:	It rejects frequencies above f_H and below f_L

7.	A monolithic timer IC which can be used as Astable and Monostable multivibrator is
Option A:	IC 565
Option B:	IC 566
Option C:	IC 555
Option D:	IC 723
8.	The input offset current is equals to
Option A:	difference between two base currents
Option B:	average of two base currents
Option C:	collector current divided by current gain
Option D:	base current divided by current gain
9.	Which is the universal Shift Register?
Option A:	74194
Option B:	7490
Option C:	7492
Option D:	7493
10.	For an ideal comparator, what should be the value of the response time?
Option A:	Zero
Option B:	Unity
Option C:	Infinite
Option D:	Unpredictable
11.	For a phase shift oscillator, the three RC cascaded networks in the feedback circuit have values of their resistances R = 3.3 kΩ and capacitances C = 0.1 μF,
Option A:	Its frequency of oscillation is ≈ 1 kHz
Option B:	Its frequency of oscillation is ≈ 3.030 kHz
Option C:	Its frequency of oscillation is ≈ 3.3 kHz
Option D:	Its frequency of oscillation is ≈ 200 Hz
12.	The basic difference between a series regulator and shunt regulator is
Option A:	The amount of current that can be handled
Option B:	The position of the control element
Option C:	The type of sample circuit
Option D:	The type of error detector
13.	An IC whose functional block diagram consists of VCO, Multiplier, Sine shaper and switches is
Option A:	IC 555
Option B:	IC 723
Option C:	XR 2206
Option D:	IC 741
14.	The common-mode voltage gain of an operational amplifier is
Option A:	Smaller than differential voltage gain
Option B:	Equal to differential voltage gain

Option C:	Greater than differential voltage gain
Option D:	Infinite
15.	An instrumentation amplifier using three op-amps is characterized by
Option A:	Variable voltage gain, low input impedance, high output impedance and high CMRR.
Option B:	Fixed voltage gain, low input impedance, low output impedance and low CMRR.
Option C:	Variable voltage gain, high input impedance, low output impedance and high CMRR.
Option D:	Fixed voltage gain, high input impedance, high output impedance and high CMRR.
16.	Voltage regulators keep a constant _____ output voltage when the input or load varies within limits.
Option A:	DC
Option B:	AC
Option C:	Ripple
Option D:	Zero
17.	A decade counter has _____ states.
Option A:	5
Option B:	10
Option C:	15
Option D:	20
18.	For an Op-amp having differential gain A_v and common mode gain A_c then CMRR is given by
Option A:	$A_v + Ac$
Option B:	A_v / A_c
Option C:	$1 + (Av / A_c)$
Option D:	A_c / A_v
19.	A counter circuit is usually constructed of .
Option A:	A number of latches connected in cascade form
Option B:	A number of NAND gates connected in cascade form
Option C:	A number of flip-flops connected in cascade
Option D:	A number of NOR gates connected in cascade form
20.	All of the following are parts of a basic voltage regulator except
Option A:	Control element
Option B:	Sampling circuit
Option C:	Voltage follower
Option D:	Error detector

Subjective/Descriptive questions

Q2	**Solve any Four out of Six** **(5 marks each)**
A	Discuss any five parameters of op-amp.

B	Draw a neat diagram of non-inverting Schmitt trigger and its voltage transfer characteristics.
C	Give any five features of IC 555.
D	Draw a neat circuit diagram of *RC* phase shift oscillator using op-amp. Derive its frequency of oscillation.
E	Draw a neat circuit of Voltage to Current converter with floating load. Give its output expression.
F	Write short note on: IC 74181 Arithmetic Logic Unit
Q3	**Solve any Four out of Six (5 marks each)**
A	With the help of a neat circuit diagram explain any one application of PLL 565.
B	What is an instrumentation amplifier? Draw a neat circuit of an instrumentation amplifier using 3 op-amps.
C	Draw and explain the functional block diagram of IC 555
D	Explain Power amplifier LM 380.
E	Write short note on: Waveform generator XR 2206
F	Draw the internal structure of IC 7490 Decade Counter. Draw its timing diagrams

University of Mumbai

Examination 2020 under cluster 5 Lead College: APSIT

Examinations Commencing from 7th January 2021 to 20th January 2021

Program:BE Electronics & Telecommunication Engineering

Curriculum Scheme: Rev 2012

Examination: TE Semester V

Course Code: ETC505 and Course Name: Integrated Circuits

Time: 2 Hours Max. Marks: 80

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