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 - S.E. (Information Technology) (REV. -2016) (Choice Based)

SEMESTER - III

Days and Dates	Time	Course Code	Paper
08 January 2021	12:30 p.m. to 02:30 p.m.	ITC301	APPLIED MATHEMATICS –III
11 January 2021	12:30 p.m. to 02:30 p.m.	ITC302	LOGIC DESIGN
13 January 2021	12:30 p.m. to 02:30 p.m.	ITC303	DATA STRUCTURES & ANALYSIS
15 January 2021	12:30 p.m. to 02:30 p.m.	ITC304	DATA BASE MANAGEMENT SYSTEM
18 January 2021	12:30 p.m. to 02:30 p.m.	ITC305	PRINCIPLE OF COMMUNICATIONS

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

Mumbai
20th December, 2020.

Principal

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

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

Program: **Information Technology Engineering**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC 301 and Course Name: Applied Mathematics III

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.	For a finite set A of size n, power set of A contains …. elements.
Option A:	2^n
Option B:	n^2
Option C:	2^{n^2}
Option D:	2n
2.	Evaluate : $L\ (\ cost + sint)$
Option A:	$\frac{s+1}{s^2+1}$
Option B:	$\frac{1}{s^2+1}$
Option C:	$\frac{1}{s}$
Option D:	0
3.	Evaluate $L^{-1}[\frac{s}{s^2+9}]$
Option A:	$Cos9t$
Option B:	$Sin2t$
Option C:	$cos3t$
Option D:	$Sin3t$
4.	If * represents usual multiplication then for x, y ∈ Z (set of integers) the property x*y =y*x is called as
Option A:	Associative Property
Option B:	Commutative Property
Option C:	Existence of Identity
Option D:	Existence of Inverse
5.	How many minimum number of students to be selected so that at least two of

	them have same birth month
Option A:	11
Option B:	12
Option C:	13
Option D:	14
6.	Complete the given statement by selecting correct option. "Set of Integers is ----- "
Option A:	Finite
Option B:	Subset of Natural numbers
Option C:	Countable
Option D:	Uncountable
7.	Define function $f: N \to Z$ as f(x) = 2x then function is
Option A:	Injective but not Surjective
Option B:	Surjective but not Injective
Option C:	Bijective
Option D:	Not a function.
8.	Find the number of ways of arranging 6 people around a round table
Option A:	6
Option B:	720
Option C:	24
Option D:	120
9.	Find L [1]
Option A:	1
Option B:	$\frac{1}{s}$
Option C:	s^2
Option D:	s
10.	Evaluate : $L^{-1}[\ tan^{-1}(s+1)]$
Option A:	$\frac{-1}{t}\, e^{-t} sint$
Option B:	$\frac{-1}{t}\, e^{-t} cost$
Option C:	$\frac{-1}{t}\, e^{-t} tant$
Option D:	$\frac{-1}{t}\, e^{-2t} sin2t$
11.	Find the value of p if f(z) = $r^2 cos2\theta$ + i $r^2 sinp\theta$ is an analytic function
Option A:	p = 0
Option B:	p = 1
Option C:	p = 2
Option D:	p = 3
12.	In how many ways can a committee consisting of three men and two women be chosen from seven men and five women?
Option A:	503
Option B:	50
Option C:	36

Option D:	350
13.	P(A) = 0.7 , P(B) = 0.6 , P(A/B)= 0.4 , Find P (B/A)
Option A:	1/35
Option B:	5/35
Option C:	7/35
Option D:	12/35
14.	Find analytic function whose imaginary part is $v = tan^{-1}(\frac{y}{x})$
Option A:	$f(z) = sinz + c$
Option B:	$f(z) = logz + c$
Option C:	$f(z) = cosecz + c$
Option D:	$f(z) = sinz + cosz + c$
15.	Find the image of $\|z\| < 1$ under the transformation $w = \frac{1}{z}$
Option A:	$Exterior\ part\ of\ circle\ \|w\| = 1$
Option B:	$Interior\ part\ of\ circle\ \|w\| = 1$
Option C:	$circle\ \|w\| = 1$
Option D:	$circle\ \|w\| = 2$
16.	The number of functions from *m* set to *n* set are
Option A:	$m + n$
Option B:	$m.n$
Option C:	m^n
Option D:	n^m
17.	Find the analytic function whose real part u = $x^2 + y^2 - 5x + y + 2$
Option A:	$f(z) = z^2 + c$
Option B:	$f(z) = z^3 - 15z + c$
Option C:	$f(z) = z^2 - 5z - iz + c$
Option D:	f(z) = z + c
18.	If $L[f(t)] = \emptyset(s)$ then $L[f(e^{-at}f(t)] = \emptyset\ (s + a)$ is statement of
Option A:	First Shifting Theorem
Option B:	Second Shifting Theorem
Option C:	Change of scale property
Option D:	Convolution Theorem
19.	For probability distribution given as follows P (X =x) = $\frac{x}{25}$ for x = 1, 3, 5, 7 ,9 Find P (4 < X < 6)
Option A:	1/25
Option B:	1/5
Option C:	3/25
Option D:	7/25

20.	$L^{-1}[\frac{1}{s+4}]$ =?
Option A:	t
Option B:	e^{4t}
Option C:	e^{-4t}
Option D:	$\frac{1}{t}$

Q2	**Solve any Four out of Six** **5 marks each**
A	Evaluate : $\int_0^\infty e^{-t}\frac{sin^2t}{t}dt$
B	Find $L^{-1}[\frac{s+29}{(s+4)(s^2+9)}]$
C	Find fixed points of bilinear transformation w= $\frac{4z-9}{z-2}$ and express it in normal form.
D	For A = { a, b} B= { a, c, d} Find elements of A X B and B X A , with reference to this example check whether cross product is commutative or not.
E	A fair coin is tossed three times .Find the probability that there will appear i) Exactly two heads on upper face ii) Exactly one head on upper face.
F	*f*: **R** →**R** given by f(x) = 2x and g : **R** → **R** is given by g(x) = $3x^2 + 2$ Find *fog* and *gof*

Q3	**Solve any Four out of Six** **5 marks each**
A	Find the Laplace Transform of the following. $t\int_0^t e^{-4u}sin3udu$
B	Find $L^{-1}[\frac{3s-7}{s^2-2s-3}]$
C	Find the imaginary part of the analytic function whose real part is $e^{2x}(xcos2y - ysin2y)$
D	In how many ways 5 girls and 6 boys can be arranged in a row so that no two girls sit together.
E	Among 50 students in a class , 26 got grade A in the first examination and 21 got grade A in the second examination. If 17 students did not get grade A in either examination, how many scored grade A in both examinations?
F	g : **R** → **R** is given by g(x) = 3x+1 Is g bijective ? If so find its inverse.

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

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

Program: **Information Technology Engineering**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC301 and Course Name: Applied Mathematics III

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.	C
Q4	B
Q5	C
Q6	C
Q7	A
Q8.	D
Q9.	B
Q10.	A
Q11.	C
Q12.	D
Q13.	D
Q14.	B
Q15.	A
Q16.	D
Q17.	C
Q18.	A
Q19.	B
Q20.	C

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

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

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC302 and Course Name: Logic Design

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.	A transistor has a βdc of 150 and a base current IB, of 12uA. Then the collector current IC, equals to:
Option A:	1.8A
Option B:	1.80mA
Option C:	1800mA
Option D:	18A
2.	Which is the most commonly used transistor configuration for amplifier application?
Option A:	CC
Option B:	CB
Option C:	CE
Option D:	CG
3.	What is the current amplification factor for Common base configuration?
Option A:	β
Option B:	η
Option C:	γ
Option D:	α
4.	2's complement of $(27)_{10}$
Option A:	00101
Option B:	11011
Option C:	10101
Option D:	10110
5.	Binary addition of $(12)_{10}$ & $(14)_{10}$ is?
Option A:	10100
Option B:	11010
Option C:	11011
Option D:	10101
6.	The ASCII code is basically how many symbols are possible?
Option A:	128
Option B:	256
Option C:	32

Option D:	65536
7.	XOR gate , could be represented using which of the following expressions
Option A:	A xor B = A'B'
Option B:	A xor B =AB' + A'B
Option C:	A xor B = AB + A'B'
Option D:	A xor B = B'(AB)A'
8.	Which of the following is universal gate
Option A:	OR
Option B:	XOR
Option C:	NOR
Option D:	NOT
9.	Which of the following is not a valid law in Boolean algebra
Option A:	Exponential Law
Option B:	De morgans law
Option C:	Absorption law
Option D:	Commutative law
10.	Don't care terms can be used for simplification of Boolean expressions using
Option A:	Latches
Option B:	K-maps
Option C:	Flip flops
Option D:	Gates
11.	Which of the following are correct equation for half adder
Option A:	Sum= A+B, Carry= AB
Option B:	Sum = A xor B , Carry = AB
Option C:	Sum= A'B', Carry = A'B
Option D:	Sum = AB, Carry = A+B'
12.	A full adder can be implemented using
Option A:	2 half adder and one OR gate
Option B:	2 half adders
Option C:	1 half adder, 1 OR gate , 1 AND gate
Option D:	1 half adder, 1 XOR gate, 1 OR gate
13.	Which of the following is not true for multiplexer
Option A:	Multiplexer is also called as Data selector
Option B:	Multiplexer is a combinational circuit
Option C:	Multiplexer can have n number of outputs
Option D:	Multiplexer has only one output
14.	Which of the following could be used to implement given expression, Sum = $\sum$m (1,2,4,7)
Option A:	Encoder
Option B:	Priority Encoder
Option C:	Decoder

Option D:	Subtractor
15.	A universal shift register is capable of
Option A:	Shifting information to another register
Option B:	Shifting information to left and load parallel data
Option C:	Shifting information to right and load parallel data
Option D:	Shifting information to both right and left and load parallel data
16.	What is the value of J and K in JK flip-flop excitation table, if (Present State)Qn=1 and (Next State)Qn+1=0
Option A:	J=0, K=X
Option B:	J=1, K=X
Option C:	J=X, K=1
Option D:	J=X, K=0
17.	What is the minimum number of flip-flops required to build a Modulus-5 counter
Option A:	5
Option B:	10
Option C:	3
Option D:	4
18.	Based on the output of D flip-flop, the equation can be represented as
Option A:	Q=D
Option B:	Q= D'
Option C:	Q=0
Option D:	Q=1
19.	VHDL design unit that has the description of the circuit is
Option A:	Configuration
Option B:	Architecture
Option C:	Library
Option D:	Entity
20.	How many architectures can be associated with an entity in VHDL?
Option A:	One or more
Option B:	Greater than one
Option C:	Exactly one
Option D:	Exactly two

Q2. **(20 Marks)**	**Solve any Two out of Three** **10 marks each**
A	Explain Input & output characteristics of BJT.
B	Convert $(168.256)_{10}$ into Binary, Octal, Hexadecimal number system & BCD, Gray and Excess-3 code.
C	Explain what are Decodes. Use 3-to-8 line decoder to implement the equations(sum and carry) of full adder.

Q3. **(20 Marks)**	**Solve any Two out of Three** **10 marks each**
A	Solve the given equation using K-maps. $f(w,x,y,z) = \sum m(0,1,2,5,6,7,9,14) + d(13)$ Realize the solved equation using logic gates.
B	Convert SR flip-flop to JK and T flip-flop
C	Explain VHDL modelling styles and write a program to implement Half Subtractor.

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

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

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC302 and Course Name: Logic Design

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

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

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC303 and Course Name: Data Structure and 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.	A data structure in which deletion can be done from front end and insertion can be done from rear end is known as a ?
Option A:	Queue
Option B:	Stack
Option C:	Tree
Option D:	Linked list
2.	If the elements “P”, “Q”, “R” and “S” are inserted in a queue and are deleted one at a time, in what order will they be removed?
Option A:	PQSR
Option B:	PRQS
Option C:	PRSQ
Option D:	PQRS
3.	If the data set is {123, 12, 23, 22, 54, 56, 45}, how many comparisons will be made in order to search 13 using binary search algorithm?
Option A:	0
Option B:	1
Option C:	2
Option D:	3
4.	If the data set is {123, 12, 23, 22, 54, 56, 45}, after first iteration what will be the updated data set in merge sort algorithm?
Option A:	{123, 12, 23, 22, 54, 56, 45}
Option B:	{12, 23, 22, 54, 56, 45, 123}
Option C:	{12, 22, 23, 45, 54, 56, 123}
Option D:	{12, 23, 22, 45, 56, 54, 123}
5.	What is the worst case time complexity of quick sort algorithm?
Option A:	O(1)
Option B:	$O(\log_2 N)$
Option C:	O(N)
Option D:	$O(N^2)$
6.	A binary tree of height H has at least H nodes and at most ---- number of nodes.
Option A:	2H

Option B:	2^H
Option C:	$2^{(H-1)}$
Option D:	2^H-1
7.	If on a tree pre order traversal is performed it will result into?
Option A:	Breadth First search result
Option B:	Depth First search result
Option C:	Infix expression
Option D:	Data sorted in ascending order
8.	In a graph total number of edges a vertex have is called as?
Option A:	In degree
Option B:	Out degree
Option C:	Degree
Option D:	Weight
9.	A vertex with zero degree is called as?
Option A:	Source
Option B:	Sink
Option C:	Fringe
Option D:	Isolated
10.	A data structure in which deletion can be done from front end and insertion can be done from rear end and front end is known as a ?
Option A:	Double ended output restricted queue
Option B:	Stack
Option C:	Queue
Option D:	Linked list
11.	In worst case, the number of comparisons need to search a singly linked list of length n for a given element is
Option A:	log n
Option B:	n/2
Option C:	log2n-1
Option D:	n
12.	A variant of linked list in which last node of the list points to the first node of the list , and first nodes previous points back to last node is?
Option A:	Singly linked list
Option B:	Doubly linked list
Option C:	Circular Doubly linked list
Option D:	Multiply linked list
13	In doubly linked lists, traversal can be performed?
Option A:	Only in forward direction
Option B:	Only in reverse direction
Option C:	Traversal cannot be done
Option D:	In both directions

14.	A variant of the linked list in which none of the node contains NULL pointer is?
Option A:	Singly linked list
Option B:	Doubly linked list
Option C:	Circular linked list
Option D:	Stack as a linked list
15.	Which data structure is defined as collection of similar data elements?
Option A:	Arrays
Option B:	Node
Option C:	Mway-Trees
Option D:	Graph
16.	The data structure used in hierarchical data model is
Option A:	Arrays
Option B:	Linked List
Option C:	Graph
Option D:	Trees
17.	Which of the following is LIFO data structure?
Option A:	Stack
Option B:	Queue
Option C:	Linked list
Option D:	Graph
18.	Stack is used in evaluation of ----- notation
Option A:	Infix expression
Option B:	regular expression
Option C:	Postfix expression
Option D:	Algebraic expression
19.	Which is the most appropriate data structure for reversing a word?
Option A:	Queue
Option B:	Stack
Option C:	Tree
Option D:	Graph
20.	What is the best case time complexity of Quick sort?
Option A:	O (N log N)
Option B:	O (N2)
Option C:	O (N)
Option D:	O (M log N)

Q2	**Solve any two questions out of three questions below. 10 marks each. Total 20 marks.**
A	Write an algorithm of merge sort. Perform the merge sort on following data. Also comment on best, average and worst case complexity of merge sort algorithm. Data = { 10, 35, 15, 22, 11, 55, 34, 54, 45, 65 }

B	What is an AVL tree? Construct an AVL tree for following data. Also mention the rotation performed at each step. Data = { 12, 25, 45, 13, 10, 55, 43, 54, 40, 65 }
C	Write a program for Binary search .

Q3.	**Solve any two questions out of three questions below. 10 marks each. Total 20 marks.**
A	What is Queue ADT? Write program for implementation of queue using array.
B	What is Circular Linked list? Write an algorithm to implement following operations on it. 1) Insert 2) Delete 3) Display
C	Write a program to implement stack using linked list.

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

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

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC303 and Course Name: Data Structure and 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.	D
Q3.	D
Q4	A
Q5	D
Q6	D
Q7	B
Q8.	C
Q9.	D
Q10	A
Q11.	D
Q12.	C
Q13.	D
Q14	C
Q15	A
Q16	D
Q17	A
Q18.	C
Q19.	B
Q20.	A

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

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

Program: EXTC

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ECCDLO7034 and Course Name: CMOS Mixed Signal VLSI

Time: 2 hour Max. Marks: 80

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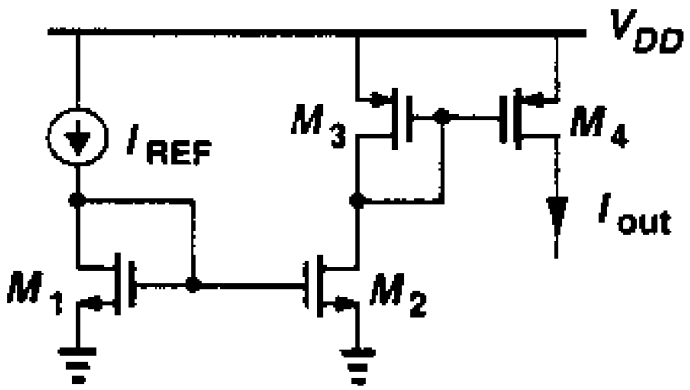
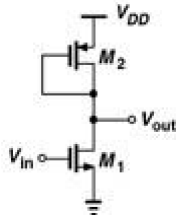
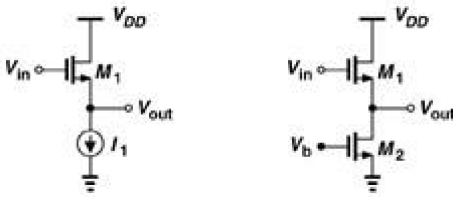
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (2 Marks each)**
1.	In the current Mirror circuit the error in the output current occurs due to
Option A:	Punch through
Option B:	Channel length Modulation
Option C:	Body Effect
Option D:	Hot electron effect
2.	In the given circuit I_{REF}=1Milliampere.$(W/L)_2$=2$(W/L)_1$ and $(W/L)_4$=2$(W/L)_3$,Then I_{OUT} Value is. 
Option A:	1Milliampere
Option B:	2Milliampere
Option C:	3Milliampere
Option D:	4Milliampere
3.	In the given CS Amplifier $(W/L)_1$=10$(W/L)_2$,Then overall voltage gain is 
Option A:	2
Option B:	3
Option C:	4
Option D:	5

4.	The given circuits are _____ Amplifiers. 
Option A:	Common Source
Option B:	Common Gate
Option C:	Common Drain
Option D:	Cascode
5.	In two stage op-amp purpose of compensation circuit is to
Option A:	High voltage gain
Option B:	To lower output resistance
Option C:	To achieve stable close loop response
Option D:	To increase output voltage swing.
6.	The main purpose of differential amplifier is
Option A:	To amplify both actual and nose signal
Option B:	To amplify actual signal and reject noise signal
Option C:	To provide large gain only to noise signal
Option D:	To provide large o/p power.
7.	The Second stage in the design of two stage op-amp is
Option A:	Differential amplifier
Option B:	Inverter
Option C:	Buffer
Option D:	High gain stage.
8.	In case of differential mode signal the two signals are having
Option A:	Equal amplitude and same phase
Option B:	Non equal amplitude and same phase
Option C:	Equal amplitude but out of phase
Option D:	Zero
9.	In order to achieve sustained oscillation the poles of amplifier should lie on
Option A:	LHS of S plane
Option B:	RHS of S plane
Option C:	On imaginary axis
Option D:	At the origin
10.	Switched capacitor circuit applied in FPAA to emulate
Option A:	RESISTORS
Option B:	INDUCTORS
Option C:	MEMORY
Option D:	BUSES

11.	PSSR can be defined as the product of the ratio of change in supply voltage to change in output voltage of op-amp caused by the change in power supply & _____ of op-amp.
Option A:	Open-loop gain
Option B	Closed-loop gain
Option C:	Close-loop with unity feedback
Option D:	Close-loop with positive feedback.
12.	Among the given ADC _____ is fastest one
Option A:	Flash type
Option B:	Integrating Type
Option C:	Pipeline type
Option D:	Charge Scaling type.
13.	For a three bit ADC V_{REF}=5V,N=3 then value of 1LSB Voltage is
Option A:	0.625
Option B:	0.5
Option C:	1.625
Option D:	1.5
14.	For a Non Inverting Switch Capacitor Amplifier if C_1 is input capacitor and C_2 is feedback capacitor then its voltage gain is given as
Option A:	$C_1 + C_2$
Option B:	$C_1 - C_2$
Option C:	C_1 / C_2
Option D:	$C_1 * C_2$
15.	In Digital PLL normally as a phase detector we use
Option A:	AND Gate
Option B:	OR Gate
Option C:	NAND Gate
Option D:	EXOR Gate
16.	In common gate amplifier
Option A:	Input resistance is high and output resistance is high
Option B:	Input resistance is high and output resistance is low
Option C:	Input resistance is low and output resistance is high
Option D:	Input resistance is low and output resistance is low
17.	For a 3 bit DAC if V_{REF}=5V,the value of $V_{STAIRCASE}$ Voltage for binary number 100 is
Option A:	1V
Option B:	1.5V
Option C:	2V
Option D:	2.5V
18.	In ADC the amount of time required to disconnect the capacitor from analog input source is known as

Option A:	Settling time
Option B:	Rise time
Option C:	Aperture time
Option D:	Periodic time
19.	CPLL stands for
Option A:	Complementary PLL
Option B:	Cascode PLL
Option C:	Clock PLL
Option D:	Charge Pump PLL.
20.	In MOSFET if Drain and Gate are Shorted then MOSFET Works in
Option A:	Linear Region
Option B:	Deep triode region
Option C:	Saturation Region
Option D:	Breakdown Region

Q2 **(20 Marks)**	**Solve any ONE Questions out of GIVEN.**
	20 marks. Design the two stage op-amp to meet the following specification with phase margin of 60^0.Assume the channel length of transistor to be 1µm.The various specifications are. A_V=4500 V/V,V_{DD}=2.5V,V_{SS}= -2.5V, GB= 5MHz, C_L=10pf, SR=10V/µsec,Vout(range)=±2V,ICMR=-1Vto2V ,P_{diss}=2mw,K_P'=50µA/V^2,K_N'=100µA/V^2, V_{TP}= -0.85V,$V_{TN(MIN)}$=0.55V,$V_{TN(MAX)}$=0.75V,λ_P=0.05 λ_N=0.04.
	OR
	10 marks Draw and explain the working of Band gap reference voltage source for integrated circuit biasing.
	10 marks. Explain the working of the Ring Oscillator circuit using MOSFET,derive its transfer function and draw its pole-zero diagram.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	Draw and explain the working of Switch capacitor Non Inverting amplifier circuit.
B	Draw and explain the working of Charge Scaling DAC.
C	Draw and explain the working of two step flash ADC.

University of Mumbai

Examination 2020 under cluster __ (Lead College: _____)

Examinations Commencing 7th January 2021 to 20th January 2021

Program:EXTC

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ECCDLO7034 and Course Name: CMOS Mixed signal VLSI.

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster 7 (Lead College: SSJCOE)

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

Program: **Information Technology**

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ITC305 and Course Name: Principle of Communication

Time: 2 hours 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.	Noise is added to a signal in a communication system
Option A:	At the receiving end
Option B:	At transmitting antenna
Option C:	In the channel
Option D:	During regeneration of the information
2.	Microwave links are generally preferred to coaxial cable for television transmission because
Option A:	they have less overall phase distortion
Option B:	they are cheaper
Option C:	of their greater bandwidths
Option D:	of their relative immunity to impulse noise
3.	Low frequency noise is
Option A:	Transit time noise
Option B:	Flicker noise
Option C:	Shot noise
Option D:	Thermal noise
4.	For a three stage cascade amplifier, calculate the overall noise figure when each stage has a gain of 12 DB and noise figure of 8dB.
Option A:	12
Option B:	24
Option C:	13.55
Option D:	8
5.	At a room temperature of 293K, calculate the thermal noise generated by two resistors of 20KΩ and 30 KΩ when the bandwidth is 10 KHz and the resistors are connected in series.
Option A:	$300.66 * 10^{-7}$
Option B:	$284.48 * 10^{-7}$
Option C:	$684.51 * 10^{-15}$
Option D:	$106.22 * 10^{-7}$
6.	Thermal noise is also known as
Option A:	Johnson noise

Option B:	Partition noise
Option C:	Flicker noise
Option D:	Solar noise
7.	The modulation index of an FM is changed from 0 to 1. How does the transmitted power change?
Option A:	halved
Option B:	doubled
Option C:	increased by 50 percent
Option D:	Remains unchanged
8.	For AM receivers the standard IF frequency is
Option A:	106 kHz
Option B:	455 kHz
Option C:	1.07 MHz
Option D:	10.7 MHz
9.	The disadvantage of FM over AM is that
Option A:	high output power is needed
Option B:	high modulating power is needed
Option C:	noise is very high for high frequency
Option D:	large bandwidth is required
10.	For a given carrier wave, maximum undistorted power is transmitted when value of modulation is
Option A:	0.8
Option B:	0.5
Option C:	1
Option D:	0
11.	Given an AM radio signal with a bandwidth of 10KHz and the highest-frequency component at 705 KHz, what is the frequency of the carrier signal?
Option A:	700KHz
Option B:	705KHz
Option C:	710KHz
Option D:	695KHz
12.	Which of the following is not an analog to analog conversion?
Option A:	AM
Option B:	PM
Option C:	FM
Option D:	QAM
13.	Indicate the false statement regarding the Armstrong modulation system
Option A:	The system is basically phase, not frequency modulation,
Option B:	AFC is not needed, as crystal oscillator is used.
Option C:	Frequency multiplication must be used
Option D:	Equalization is unnecessary

14.	If the carrier of a 100 percent modulated AM wave is suppressed, the percentage power saving will be
Option A:	50
Option B:	150
Option C:	100
Option D:	66.66
15.	A distorted signal of frequency fm is recovered from a sampled signal if the sampling frequency fs is
Option A:	fs > 2fm
Option B:	fs < 2fm
Option C:	fs = 2fm
Option D:	fs ≥ 2fm
16.	In pulse amplitude modulation,
Option A:	Amplitude of the pulse train is varied
Option B:	Width of the pulse train is varied
Option C:	Frequency of the pulse train is varied
Option D:	Angle of the pulse train is varied
17.	When aliasing will take place?
Option A:	Sampling signals less than Nyquist Rate
Option B:	Sampling signals more than Nyquist Rate
Option C:	Sampling signals equal to Nyquist Rate
Option D:	Sampling signals at a rate which is twice of Nyquist Rate
18.	Which of the following is most affected by noise?
Option A:	PSK
Option B:	FSK
Option C:	QAM
Option D:	ASK
19.	If the bit rate for an ASK signal is 1200bps ,the baud rate is
Option A:	300
Option B:	400
Option C:	600
Option D:	1200
20.	How many carriers are used in BPSK?
Option A:	0
Option B:	1
Option C:	2
Option D:	3

Q2 A	**Solve any Two** **5 marks each**
i.	List the need of modulation and justify how modulation avoids mixing of signals and improves quality of reception.
ii.	State and prove any one properties of Fourier transform with example
iii	.Explain in short pre-emphasis and de-emphasis

B	**Solve any One** **10 marks each**
i.	The AM Transmitter develops an unmodulated power output of 400 Watts across a 50Ω resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of 0.8. Assuming f_m= 5 KHz and f_c= 1MHz. (i) Obtain the value of carrier amplitude Vc and hence write the expression for AM signal. (ii) Find the total sideband power. (iii) Draw the AM wave for the given modulation index.
ii.	With the help of neat diagram and waveform explain PWM generation and detection.

Q3 A	**Solve any Two** **5 marks each**
i.	Explain slope overload error and hunting error in Delta modulation
ii.	Write short note on QAM
iii	Write short note on TDM Technique.
B	**Solve any One** **10 marks each**
i.	Explain in brief with block diagram PCM transmitter and Receiver
ii.	Compare ground wave, sky wave and troposphere scatter radio wave propagation

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Program: **Information Technology**

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Examination: SE Semester III

Course Code: ITC305 and Course Name:Principle of Communication

Time: 2 hours Max. Marks: 80

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