University of Mumbai

Examination 2021 under cluster __ (Lead College: _____)

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

Program: BE (Electronics and Telecommunication Engineering)

Curriculum Scheme: Revised 2016(CBCGS)

Examination: SE Semester III

Course Code: ECC301 and Course Name: Applied Mathematics-III

Time: 2 hour Max. Marks: 80

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Q1.	**All the Questions are compulsory and carry equal marks 2 marks each**
1.	Laplace Transform of $\sin(\frac{\sqrt{3}}{2}t)$ is
Option A:	$\frac{\sqrt{3}}{4s^2+3}$
Option B:	$\frac{2\sqrt{5}}{4s^2+3}$
Option C:	$\frac{2\sqrt{3}}{4s^2+3}$
Option D:	$\frac{2\sqrt{3}}{s^2+3}$
2.	If $f(x)=2x, 0\le x\le 2\pi$ then a_4 is given by
Option A:	π
Option B:	-4π
Option C:	4
Option D:	4π
3.	What is the Fourier series expansion of the function f(x) in the interval $(0,2l)$?
Option A:	$\sum_{n=1}^{\infty} a_n \cos(\frac{n\pi x}{l}) + \sum_{n=1}^{\infty} b_n \sin(\frac{n\pi x}{l})$
Option B:	$a_0 + \sum_{n=1}^{\infty} a_n \cos(\frac{n\pi x}{l})$
Option C:	$a_0 + \sum_{n=1}^{\infty} a_n \cos(\frac{n\pi x}{l}) + \sum_{n=1}^{\infty} b_n \sin(\frac{n\pi x}{l})$
Option D:	$a_0 + \sum_{n=1}^{\infty} b_n \sin(\frac{n\pi x}{l})$
4.	Laplace Transform of $e^{3t}\sin t$ is
Option A:	$\frac{1}{(s^2+6s+10)}$
Option B:	$\frac{1}{(s^2-6s-10)}$

Option C:	$\frac{3}{(s^2-6s+10)}$
Option D:	$\frac{1}{(s^2-6s+10)}$
5.	$J_{\frac{1}{2}}(x) = ---$
Option A:	$\sqrt{\frac{2}{\pi x}}\sin x$
Option B:	$nJ_n(x) - xJ_{n+1}(x)$
Option C:	$nJ_n(x) + xJ_{n+1}(x)$
Option D:	$\sqrt{\frac{2}{\pi x}}\cos x$
6.	$J_{-n}(x) = ----$
Option A:	$(-1)^n J_{n+1}(x)$
Option B:	$(-1)^n J_n(x)$
Option C:	$(-1)^{n+1} J_n(x)$
Option D:	$(-1)J_n(x)$
7.	$L^{-1}[\frac{s-1}{s^2-2s+5}] = ------$
Option A:	$e^t \cos 2t$
Option B:	$e^{-t} \cos 2t$
Option C:	$-e^t \cos 2t$
Option D:	$e^t \cos 4t$
8.	$\nabla r^n = ----$
Option A:	$nr^n r^-$
Option B:	$r^{n-2} r^-$
Option C:	$nr^{n+2} r^-$
Option D:	$nr^{n-2} r^-$
9.	The Fourier Coefficient a_n for $f(x) = x^2, 0 \prec x \prec 2l$ is
Option A:	$-\frac{4l^2}{n^2\pi^2}$
Option B:	$\frac{4l^2}{n^2\pi^2}$
Option C:	$\frac{l^2}{n^2\pi^2}$
Option D:	$\frac{4l^2}{\pi^2}$

10.	$\frac{d}{dx}[x^n J_n(x)] = ----$
Option A:	$x^{n-1}J_{n-1}(x)$
Option B:	$x^n J(x)$
Option C:	$-x^n J_n(x)$
Option D:	$x^n J_{n-1}(x)$
11.	If $u = x^2 - y^2$ then analytic function f(z) is
Option A:	z^2+c
Option B:	$-z^2$+c
Option C:	z^3+c
Option D:	$2z^2$+c
12.	The only function among the following, that is analytic ,is
Option A:	$f(z) = Riz$
Option B:	$f(z) = Rmz$
Option C:	$f(z) = z^-$
Option D:	$f(z) = \sin z$
13.	If f(z) is analytic and equals u(x,y)+iv(x,y) then $f'(z)$ equals
Option A:	$\frac{\partial u}{\partial x} - i\frac{\partial u}{\partial y}$
Option B:	$\frac{\partial u}{\partial x} - i\frac{\partial v}{\partial x}$
Option C:	$\frac{\partial v}{\partial y} - i\frac{\partial v}{\partial x}$
Option D:	$-\frac{\partial u}{\partial x} - i\frac{\partial u}{\partial y}$
14.	Which of the following is an “even” function of x?
Option A:	sinx
Option B:	$\lvert x \rvert$
Option C:	x^3
Option D:	x+1
15.	In a Half Range cosine series of a function which of the following Fourier coefficient is/are zero.
Option A:	a_n
Option B:	a_0
Option C:	b_n
Option D:	a_0, a_n
16.	If a force $F^- = 2x^2yi + 3xyj$ displaces a particle in the xy-plane from (0,0) to (1,4) along a curve $y=4x^2$ then the work done is

Option A:	$\frac{104}{5}$
Option B:	$\frac{104}{25}$
Option C:	$-\frac{104}{5}$
Option D:	$\frac{10}{5}$
17.	In order that the function $f(z)=\frac{\lvert z\rvert^2}{z}, z\neq 0$ be continuous at z=0, we should define f(0) equal to
Option A:	2
Option B:	-1
Option C:	0
Option D:	1
18.	A unit normal to the surface $x^2y+2xz=4$ at the point (2,-2,2) is given by
Option A:	$\frac{-i+j+k}{\sqrt{3}}$
Option B:	$\frac{i+j+k}{\sqrt{3}}$
Option C:	$\frac{-i-j+k}{\sqrt{3}}$
Option D:	$\frac{-i+j+k}{\sqrt{2}}$
19.	A set of functions $f_1(x), f_2(x), f_3(x)$------$f_n(x)$--- is said to be orthonormal if
Option A:	$\int_a^b f_m(x)f_n(x)dx = \begin{cases} 1, if\ m \neq n \\ 0, if\ m = n \end{cases}$
Option B:	$\int_a^b f_m(x)f_n(x)dx = \begin{cases} 0, if\ m \neq n \\ 2, if\ m = n \end{cases}$
Option C:	$\int_a^b f_m(x)f_n(x)dx = \begin{cases} 0, if\ m \neq n \\ 1, if\ m = n \end{cases}$
Option D:	$\int_a^b f_m(x)f_n(x)dx = \begin{cases} 2, if\ m \neq n \\ 1, if\ m = n \end{cases}$
20.	$L^{-1}[\frac{2s+3}{s^2+2s+2}] = -----$
Option A:	$e^{-t}(2\cos t+\sin t)$
Option B:	$e^{-t}(2\cos t-\sin t)$
Option C:	$e^{-t}(\cos t+\sin t)$
Option D:	$e^{-t}(\cos t+2\sin t)$
Q2.	**Solve any Four out of Six** **5 marks each**

A	*Obtain a Fourier expression for* $f(x)=x^3,-\pi \prec x \prec \pi$
B	*Use Green's theorem to evaluate* $\int_c (x^2+xy)dx+(x^2+y^2)dy$ *where c is the square formed by the lines* $y=\pm 1, x=\pm 1$.
C	*Find the Laplace Transform of the Periodic function* $f(t)=\frac{kt}{T}, 0 \prec t \prec T, f(t+T)=f(t)$
D	Let $f(z)=u(r,\theta)+iv(r,\theta)$ be an analytic function. If $u=-r^3\sin 3\theta$ then construct the corresponding analytic function f(z) in terms of z.
E	Find the value of 'n'for which the vector $r^n r^-$ is solenoidal, where $r^- = xi+yj+zk$
F	Solve the initial value problem $2\frac{d^2y}{dt^2}+5\frac{dy}{dt}+2y=e^{-2t}, y(0)=1, y'(0)=1$
Q3.	**Solve any Four out of Six** **5 marks each**
A	*Using the convolution theorem ,find* $L^{-1}[\frac{s^2}{(s^2+a^2)(s^2+b^2)}], a \neq b$
B	*A fluid motion is given by* $v^- = (y\sin z-\sin x)i+(x\sin z+2yz)j+(xy\cos z+y^2)k$ *is the motion irrotational? If so, find the velocity potential.*
C	*Evaluate* $L[\frac{e^{-4t}\sin 3t}{t}]$
D	*Find the image of* $\lvert z-3i\rvert=3$ *under the mapping* $w=\frac{1}{z}$
E	*Using Stoke's theorem, evaluate* $\int_c [(2x-y)dx-yz^2dy-y^2zdz]$ *where c is the circle* $x^2+y^2=1$, *corresponding to the surface of sphere of unit radius.*
F	*Given that* $f(x)=x+x^2,-\pi \prec x \prec \pi$ *, find the Fourier expression of f(x)*

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Program: BE (Electronics and Telecommunication Engineering)

Curriculum Scheme: Revised 2016(CBCGS)

Examination: Second Year Semester III

Course Code: ECC301 and Course Name: Applied Mathematics-III

Time: 2 hour Max. Marks: 80

==========

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

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev-2016

Examination: SE Semester III

Course Code: ECC304 and Course Name: Circuit Theory and Network

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.	Laplace equivalent of Inductor(L) with zero initial condition is given by ----.
Option A:	1/L
Option B:	LS
Option C:	1/LS
Option D:	L/S
2.	Find Vx
Option A:	6 V
Option B:	2 V
Option C:	7 V
Option D:	9 V
3.	In nodal analysis, if there are 6 nodes in the circuit then how many equations will be written to solve the network?
Option A:	7
Option B:	6
Option C:	5
Option D:	4
4.	The Thevenin voltage at terminal A-B is
Option A:	9.6 V
Option B:	2.5 V
Option C:	14.5 V

Option D:	15 V
5.	Find current Ix.
Option A:	2 A
Option B:	0.25 A
Option C:	0.50 A
Option D:	0.17 A
6.	How many tie sets will be generated for a graph with 4 nodes and 5 branches?
Option A:	2
Option B:	5
Option C:	7
Option D:	3
7.	If Y-parameters are $Y_{11} = 0.5$, $Y_{22} = 1$ and $Y_{12} = Y_{21} = -O.2$, what would be the value of ΔY.
Option A:	2
Option B:	3
Option C:	0.32
Option D:	0.46
8.	Reverse voltage gain with output port open circuited in Transmission-parameters is a unitless quantity and generally equivalent to
Option A:	V_1 /I_1 (keepingV_2 =0)
Option B:	I_2 / I_1 (keeping $V_2 = 0$)
Option C:	V_1 / V_2 (keeping $I_2 = 0$)
Option D:	I_2 / V_2 (keeping $I_1 = 0$)
9.	In the following RC series circuit, switch is closed at t=0,Find i(o+).
Option A:	0.1 A
Option B:	0.2 A
Option C:	0.3 A
Option D:	2 A
10.	Find I_2 /I_1

Option A:	$200/(S^2+20S+400)$
Option B:	$S/(S+2)$
Option C:	$400/(S^2+20S+400)$
Option D:	$(S+4)/S(S+1)$
11.	Superposition theorem is not applicable to network containing
Option A:	Nonlinear element
Option B:	Linear element
Option C:	Dependent current source
Option D:	Dependent voltage source
12.	Find Z_{11} for the network
Option A:	3
Option B:	2
Option C:	4
Option D:	5
13.	In which properties of realization of function is that Highest as well as lowest power of Numerator and denominator differ by unity.
Option A:	RC
Option B:	LC
Option C:	RL
Option D:	RLC
14.	A 2-port network is shown in the figure. The parameter h_{21} for this network can be given by
Option A:	-0.5
Option B:	-0.25
Option C:	-2
Option D:	-4.5
15.	In the network, switch is closed and a steady state is reached in network, At t=0,switch is opened ,Find $i_2(0^-)$

Option A:	10 A
Option B:	20 A
Option C:	30 A
Option D:	40 A
16.	Find voltage transfer function $V_2(S)/V_1(S)$ of two port network.
Option A:	1/(RCS+1)
Option B:	R+CS
Option C:	RCS+1
Option D:	R/CS
17.	The driving point impedance function Z(S) of the network is
Option A:	$(20S^4+22S^2+1)/5S(3S^2+1)$
Option B:	$(30S^4+S^2+1)/5S(2S^2+1)$
Option C:	1.5(S+2)/S+1.5
Option D:	$(30S^4+22S^2+1)/5S(2S^2+1)$
18.	Assume zero voltage across capacitor at t=0, $i(0^+)$ is
Option A:	20 A
Option B:	50A
Option C:	30 A
Option D:	40 A
19.	Which of following is not Hurwitz polynomial?
Option A:	S^4+4S^3+5S+1
Option B:	$S^5+ S^4+4S^3+5S+8$

Option C:	$(S+1)(S^2+2S+3)$
Option D:	$S^5+ S^4+4S^3-5S+1$
20.	Which of following positive real function F(S), residue test is carried out?
Option A:	$(S+3)/(S+1)$
Option B:	$(S^2+1)/(S^3+4S)$
Option C:	$(S^3+6S^2+7S+3)/(S^2+2S+1)$
Option D:	$(S^2+6S+5)/(S^2+9S+14)$

subjective/descriptive questions

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Find Nortons equivalent network at terminal A and B
B	For the network shown, determine $Z_{11}(S)$, $G_{12}(S)$ and $Z_{12}(S)$.
C	Two Identical sections of network are connected in cascade, obtain ABCD Parameters of overall connections

Q3.	**Solve any Two Questions out of Three** **10 marks each**
A	**Obtain equilibrium equation on node basis for the network**

B	**In the Network, switch is closed, assuming all initial conditions as zero,Find i,di/dt,d^2i/dt^2**
C	**Realize Impedance function in Foster I and Foster II form.** **$Z(s)=S(S^2+4)/(S^2+1)(S^2+9)$**

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev-2016

Examination: Second Year Semester III

Course Code: ECC304 and Course Name: Circuit Theory and Network

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.	A
Q3.	C
Q4	A
Q5	B
Q6	A
Q7	D
Q8.	C
Q9.	A
Q10.	C
Q11.	A
Q12.	A
Q13.	B
Q14.	A
Q15.	A
Q16.	A
Q17.	D
Q18.	B
Q19.	D
Q20.	B

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Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: BE Electronics and Telecommunication

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ECC303and Course Name: Digital System 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.	The representation of octal number (531.2)8 in decimal is
Option A:	(346.25)10
Option B:	(532.864)10
Option C:	(345.25)10
Option D:	(531.668)10
2.	Representation of hexadecimal number (6FC)H in decimal:
Option A:	$6 * 16^2 + 13 * 16^1 + 14 * 16^0$
Option B:	$6 * 16^2 + 15 * 16^1 + 12 * 16^0$
Option C:	$6 * 16^2 + 12 * 16^1 + 13 * 16^0$
Option D:	$6 * 16^2 + 14 * 16^1 + 15 * 16^0$
3.	2's complement of 10101011 is _____
Option A:	01010101
Option B:	11010100
Option C:	00110101
Option D:	11100010
4.	On subtracting (01010)2 from (11100)2 using 1's complement, we get _____.
Option A:	01001
Option B:	10010
Option C:	10101
Option D:	10100
5.	How many truth table entries are necessary for a three-input circuit?
Option A:	4
Option B:	12
Option C:	8
Option D:	16
6.	Which input values will cause an AND logic gate to produce a HIGH output?
Option A:	At least one input is HIGH
Option B:	At least one input is LOW
Option C:	All inputs are HIGH
Option D:	All inputs are LOW

7.	Exclusive-OR (XOR) logic gates can be constructed from what other logic gates?
Option A:	AND gates, OR gates, and NOT gates
Option B:	OR gates only
Option C:	OR gates and NOT gates
Option D:	AND gates and NOT gates
8.	Transistor-transistor logic (TTL) is a class of digital circuits built from _____ .
Option A:	JFET only
Option B:	Bipolar junction transistors (BJT)
Option C:	Resistors
Option D:	Bipolar junction transistors (BJT) and resistors
9.	TTL devices consume substantially _____ power than equivalent CMOS devices at rest.
Option A:	Less
Option B:	More
Option C:	Equal
Option D:	Very High
10.	CMOS technology is used in _____
Option A:	Inverter
Option B:	Microprocessor
Option C:	Digital logic
Option D:	Both microprocessor and digital logic
11.	One application of an S-R flip-flop is as _____
Option A:	Transition pulse generator
Option B:	Racer
Option C:	Switch debouncer
Option D:	Astable oscillator
12.	The truth table for an S-R flip-flop has how many VALID entries?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
13.	What is a trigger pulse?
Option A:	A pulse that starts a cycle of operation
Option B:	A pulse that reverses the cycle of operation
Option C:	A pulse that prevents a cycle of operation
Option D:	A pulse that enhances a cycle of operation
14.	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
15.	Which one of the following has capability to store data in extremely high densities?

Option A:	Register
Option B:	Capacitor
Option C:	Semiconductor
Option D:	Flip-Flop
16.	A shift register that will accept a parallel input or a bidirectional serial load and internal shift features is called as?
Option A:	Tristate
Option B:	End around
Option C:	Universal
Option D:	Conversion
17.	A 5-bit asynchronous binary counter is made up of five flip-flops, each with a 12 ns propagation delay. The total propagation delay (tp(tot)) is _____
Option A:	12 ms
Option B:	24 ns
Option C:	48 ns
Option D:	60 ns
18.	Which is not a type of shift register?
Option A:	Serial in/parallel in
Option B:	Serial in/parallel out
Option C:	Parallel in/serial out
Option D:	Parallel in/parallel out
19.	Which of the following is not a type of VHDL modeling?
Option A:	Behavioral modeling
Option B:	Dataflow modeling
Option C:	Structural modeling
Option D:	Component modeling
20.	The difference between a PAL & a PLA is _____
Option A:	PALs and PLAs are the same thing
Option B:	The PLA has a programmable OR plane and a programmable AND plane, while the PAL only has a programmable AND plane
Option C:	The PAL has a programmable OR plane and a programmable AND plane, while the PLA only has a programmable AND plane
Option D:	The PAL has more possible product terms than the PLA

Q2 **(20 Marks Each)**	**Solve any Four out of Six** **5 marks each**
A	Write a short note on Gray code.
B	Write a short note on VHDL.

C	Explain carry look ahead adder with necessary diagram.
D	Explain Master-Slave JK flip-flop.
E	Explain Flash memories.
F	Differentiate between Moore and Mealy circuits.

Q3. **(20 Marks Each)**	**Solve any Four out of Six** **5 marks each**
A	Explain De-Morgan's theorems and prove it.
B	Compare TTL and CMOS logic families.
C	Convert J-K flip flop to T flip flop.
D	Differentiate between PAL and PLA.
E	Explain Johnson's counter.
F	Design 16:1 multiplexer using 4:1 multiplexer.

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Examination June 2021

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Program: BE Electronics and Telecommunication

Curriculum Scheme: Rev2016

Examination: SE Semester III

Course Code: ECC303and Course Name: Digital System Design

Time: 2 hour Max. Marks: 80

==========

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

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Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **Electronics & Telecommunication**

Curriculum Scheme: Rev 2016

Examination: SE Semester III

Course Code: ECC302 and Course Name: Electronic Devices & Circuits-I

Time: 2 hour Max. Marks: 80

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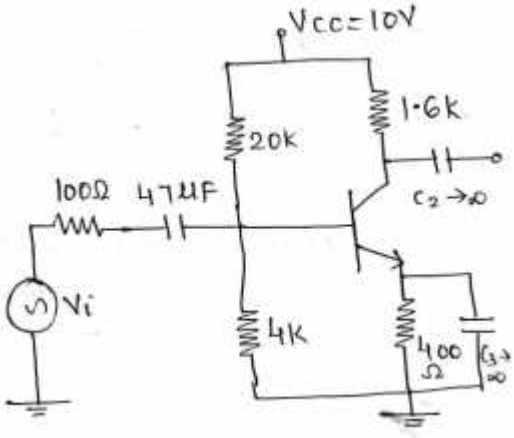
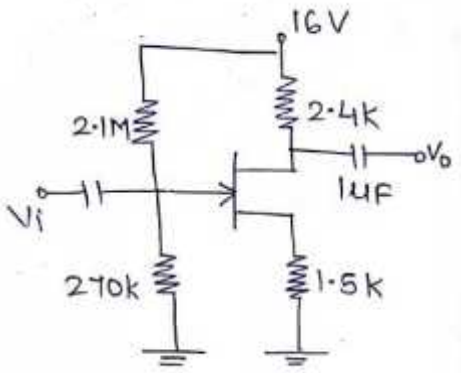
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks.**
1.	Gain bandwidth product is a transistor parameter that is constant and equal to__.
Option A:	Total frequency
Option B:	Unity gain frequency
Option C:	Sum of frequencies
Option D:	Critical frequency
2.	A capacitor having rating 50 µF, 6V and plus sign near to one of its terminals, the capacitor must be ___ .
Option A:	A mica capacitor
Option B:	A ceramic capacitor
Option C:	An electrolytic capacitor
Option D:	An Air Gang capacitor
3.	In a LC filter, the ripple factor ___ .
Option A:	Increases with the load current
Option B:	increases with the load resistance
Option C:	remains constant with the load current
Option D:	has the lowest value
4.	The input impedance of a FET is of the order of _____ .
Option A:	10 ^ 20 ohms
Option B:	Hundreds of Mega ohms
Option C:	Hundred ohms
Option D:	A few ohms
5.	In designing a CS JFET amplifier, which of the data is not provided by the datasheet?
Option A:	Transconductance (g_{m0})
Option B:	Pinch off voltage
Option C:	Voltage gain
Option D:	I_{DSS}
6.	A bipolar transistor is operating in the active region with a collector current of 1 mA. Assuming that the β of the transistor is 100 and the thermal voltage (V_T) is 25 mV. The transconductance and the input resistance (r_π) of the transistor in the common emitter configuration are

Option A:	$g_m = 25$ mA/V and $r_\pi = 15.625$ kΩ
Option B:	$g_m = 40$ mA/V and $r_\pi = 4$ kΩ
Option C:	$g_m = 25$ mA/V and $r_\pi = 2.5$ kΩ
Option D:	$g_m = 40$ mA/V and $r_\pi = 2.5$ kΩ
7.	For which of the following conditions the designing of the JFET amplifier cannot be done?
Option A:	Midpoint Biasing
Option B:	Variation in I_{DS}
Option C:	Zero temperature drift
Option D:	Variation in beta parameter
8.	For a CE amplifier with voltage divider biasing with bypassed R_E, $R_1 = 40$ kΩ, $R_2 = 10$ kΩ, $r_\pi = 1.15$ kΩ the input impedance of the amplifier using hybrid pi model is
Option A:	1.005 kΩ
Option B:	9.15 kΩ
Option C:	5.15 kΩ
Option D:	8.25 kΩ
9.	The % load regulation of a power supply should be ideally _____ & practically _____
Option A:	zero, small
Option B:	small, zero
Option C:	zero, large
Option D:	large, zero
10.	In a common-source JFET amplifier, the output voltage is ……
Option A:	180^o out of phase with the input
Option B:	in phase with the input
Option C:	90^o out of phase with the input
Option D:	taken at the source
11.	For a self-bias circuit, find drain to source voltage if V_{DD}=12V, I_D=1mA, R_s=R_D=1KΩ?
Option A:	1 V
Option B:	2 V
Option C:	10 V
Option D:	5 V
12.	Generally, the gain of a transistor amplifier falls at high frequency due to the
Option A:	Internal capacitance of the device
Option B:	Coupling capacitor at the input
Option C:	Skin effect
Option D:	Coupling capacitor at the output
13.	For design of self-bias CS JFET circuit, if the lower cut of frequency is 20 Hz, R_G is 1 MΩ then the value of input coupling capacitor is ___ .
Option A:	8 nF
Option B:	80 nF

Option C:	8 μF
Option D:	80 μF
14.	In a small signal equivalent model of an FET, what does $g_m V_{GS}$ stand for?
Option A:	A pure resistor
Option B:	Voltage controlled current source
Option C:	Current controlled current source
Option D:	Voltage controlled voltage source
15.	Which resistance in the hybrid π model of transistor represents the bulk resistance present between the external base terminal and the virtual base?
Option A:	Collector-to-emitter resistance (r_{ce})
Option B:	Base spreading resistance ($ŕ_{bb}$)
Option C:	Virtual base to emitter resistance ($ŕ_{be}$)
Option D:	Emitter resistance (R_E)
16.	In voltage divider bias, V_{CC} = 25 V; R_1 = 10 kΩ; R_2 = 5 kΩ; V_{BE} =0.7 V, R_C = 2kΩ, β =100 and R_E =1 kΩ. What is the emitter voltage?
Option A:	3.71 V
Option B:	5.35 V
Option C:	4.96V
Option D:	7.38 V
17.	If RC and RL represent the collector resistance and load resistance respectively in a single stage transistor amplifier, then a.c. load is ……..
Option A:	RL + RC
Option B:	RC || RL
Option C:	RL – RC
Option D:	RC
18.	In a shunt capacitor filter, the mechanism that helps the removal of ripples is_____ .
Option A:	The current passing through the capacitor
Option B:	The voltage variations produced by shunting the capacitor
Option C:	The property of capacitor to store electrical energy
Option D:	Uniform charge flow through the rectifier
19.	Which effect plays a critical role in producing changes in the frequency response of the BJT.?
Option A:	Thevenin's effect
Option B:	Miller effect
Option C:	Tellegen's effect
Option D:	Norton's effect
20.	Zener diode is designed to specifically work in which region without getting damaged?
Option A:	Active region
Option B:	Breakdown region
Option C:	Forward bias
Option D:	Reverse bias

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Design the resistors for a single stage RC coupled CE amplifier to meet the following specifications Vo=2V, Av=90, S=8, f_L=20 Hz.
B	Draw a neat circuit diagram of CS FET amplifier and derive the expression for input impedance, output impedance and voltage gain.
C	For the circuit shown below, the transistor parameters are $V_{BE(on)}$ =0.7 V, β = 100, find the lower cut off frequency of the circuit. 

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	For the circuit shown below, I_{DSS} = 8 mA, V_P = - 4 V, determine V_{GS}, V_{DS} and I_D 
B	A full wave rectifier with center tapped transformer and 2 diodes gives dc output voltage at 18 V to a resistive load and a current of 75±25 mA. If ripple factor is to be 0.06 design an inductor filter.
C	Define stability factor. Derive the equation for stability factor. State which biasing technique is more stable. Justify your answer.

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **Electronics & Telecommunication**

Curriculum Scheme: Rev 2016

Examination: SE Semester III

Course Code: ECC302 and Course Name: Electronic Devices & Circuits-I

Time: 2 hour Max. Marks: 80

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