University of Mumbai
Examination June 2021
Examinations Commencing from 15th June 2021 to 26th June 2021
Program: Electronics and Telecommunication Engineering
Curriculum Scheme: Rev 2019
Examination: SE, Semester: III
Course Code: ECC302 and Course Name: Electronic Devices and Circuits
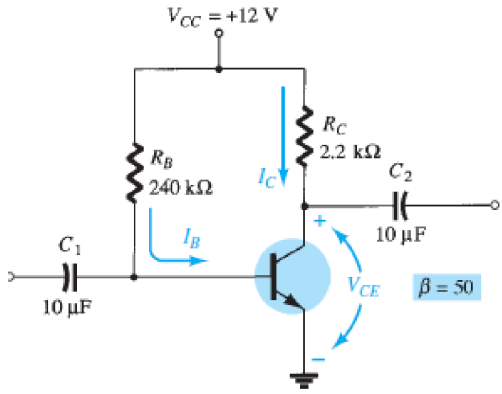
Time: 2 Hour   Max. Marks: 80

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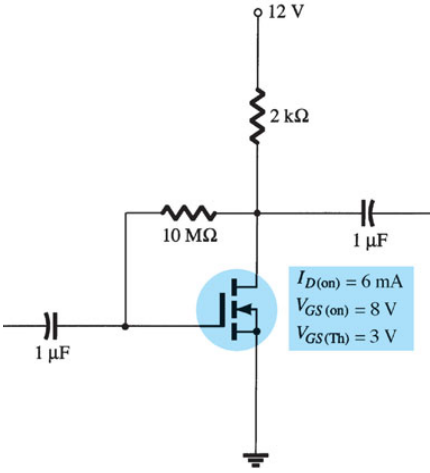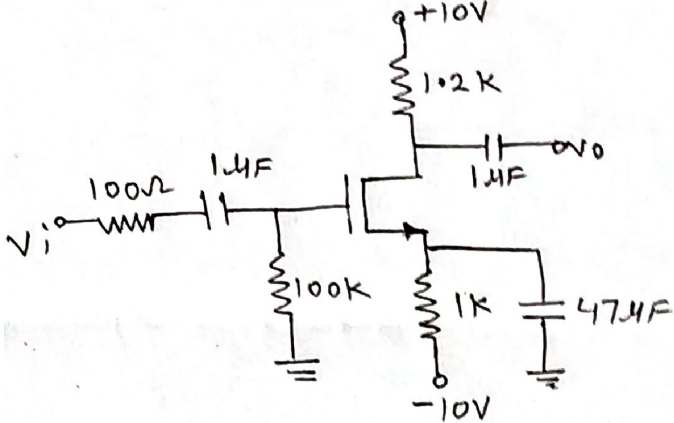| Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	For Zener diode as a voltage regulator , load regulation means _____
Option A:	variable input voltage and fixed load resistor
Option B:	variable input voltage and variable load resistor
Option C:	fixed input voltage and variable load resistor
Option D:	fixed input voltage and fixed load resistor
2.	As an Amplifier BJT should be used in _____ region.
Option A:	Cut-off
Option B:	Saturation
Option C:	Breakdown
Option D:	Active
3.	As an Amplifier MOSFET should be used in _____ region.
Option A:	Cut-off
Option B:	Saturation
Option C:	Breakdown
Option D:	linear
4.	In BJT according to higher to lower doping concentration sequence is _____
Option A:	base,emitter and collector
Option B:	emitter, collector and base
Option C:	collector,base and emitter
Option D:	Emitter, base and collector
5.	In BJT for Active region _____ junction should be forward bias and _____ junction should be reverse bias
Option A:	BE, CB
Option B:	CB, BE
Option C:	BE, EB
Option D:	CE, BE

6.	In BJT biasing circuits VBE decreases about _____ per degree celsius(°C) increase in temperature.
Option A:	25mV
Option B:	2.5mV
Option C:	2.5V
Option D:	25V
7.	ICO (reverse saturation current) _____ in value for every 10°C increase in temperature
Option A:	triples
Option B:	remains same
Option C:	zero
Option D:	doubles
8.	Which among the below mentioned implementation strategies is/are precise to obtain an AC equivalent circuit of MOSFET? A. Replacement of all capacitors by open circuits B. Replacement of all capacitors by short circuits C. Setting of all DC voltages to zero D. Setting of all DC voltages to unity
Option A:	A & C
Option B:	B & C
Option C:	B & D
Option D:	A & D
9.	The E-MOSFET drain feedback CS amplifier with the result that rd = 50 k, RF = 10M, RD = 2.2 K, gm = 1.75 mS, find the output impedance?
Option A:	49.75 k
Option B:	2.11 k
Option C:	50 k
Option D:	10 M
10.	When a multistage amplifier is to amplify low frequency signal, then one must use …….. coupling
Option A:	RC
Option B:	Transformer
Option C:	Direct
Option D:	impedance
11.	In a multistage amplifier, the overall frequency response is determined by the
Option A:	Frequency response of each stage depending on the relationships of the critical frequencies.

Option B:	frequency response of the first amplifier
Option C:	frequency response of the last amplifier
Option D:	lower critical frequency of the first amplifier and the upper critical frequency of the final amplifier
12.	In the mid frequency region, coupling capacitor acts as a _____ circuits and stray capacitance acts as a _____ circuits
Option A:	open, short
Option B:	short, open
Option C:	short, short
Option D:	open, open
13.	The _____ of the two values of higher cutoff frequencies is the dominant frequency of complete system
Option A:	highest
Option B:	lowest
Option C:	middle
Option D:	average
14.	Which BJT transistor has a better high frequency response?
Option A:	NPN
Option B:	PNP
Option C:	Neither NPN nor PNP
Option D:	Frequency response doesn't depend on type of BJT
15.	The size of a power transistor is made considerably large to ………….
Option A:	Provide easy handling
Option B:	Dissipate heat
Option C:	Facilitate connections
Option D:	Consume heat
16.	The main disadvantage of class B type push-pull power amplifier is
Option A:	Harmonic distortion
Option B:	Aliasing problem
Option C:	Crossover distortion
Option D:	Two transistor required
17.	If differential mode gain is 3500 and common mode gain is 3.5, the CMRR is _____
Option A:	1000
Option B:	0.001
Option C:	12250
Option D:	3503.5

18.	CMRR of a differential amplifier can be improved by decreasing _____
Option A:	Differential voltage gain
Option B:	Common mode voltage gain
Option C:	Supply current
Option D:	Supply voltage
19.	When a differential amplifier is operated single-ended, …………
Option A:	The output is grounded
Option B:	One input is grounded and signal is applied to the other
Option C:	Both inputs are connected together
Option D:	The output is not inverted
20.	In the common mode, ……………
Option A:	Both inputs are grounded
Option B:	The outputs are connected together
Option C:	An identical signal appears on both the inputs
Option D:	The output signal are in-phase

Q2	Solve any Two Questions out of Three 10 marks each
A	Draw high frequency equivalent circuit of MOSFET CS amplifier with Rs unbypassed and self bias. Derive the expression for input and output upper cutoff frequencies with considering input signal resistor (Rsig) and load resistor (R_L).
B	Explain class-AB push pull amplifier in detail?
C	Find the Q point for the following circuit Fig. 1, and also determine the voltage gain, input impedance and output impedance Fig. 1

Q3.	
A	**Solve any Two 5 marks each**
i.	Explain Zener diode as a voltage regulator

ii.		Explain construction and working of n-channel E-MOSFET
iii.		Find the Q point for the following circuit Fig. 2 Fig. 2
B		**Solve any One 10 marks each**
i.		For the circuit shown in Fig. 3, Transistor parameters are $Kn = 1$ mA/V^2, $Vtn = 0.7$ V, $Cgs = 2$ pF, $Cgd = 0.2$ pF, $\lambda = 0$, find the mid band voltage gain, miller capacitance and upper cut-off frequency. Fig. 3
ii.		Derive the equation of CMRR for the MOS differential pair amplifier.

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