Program: SE

Curriculum Scheme: Revised 2019

Examination: Second Year Semester III

Course Code: ECC/320 **Course Name: Electronics devices circuit**

Time: 1-hour Max. Marks: 80

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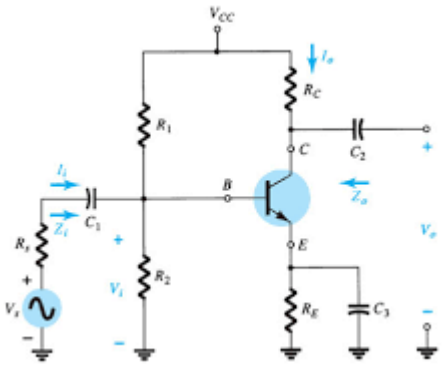
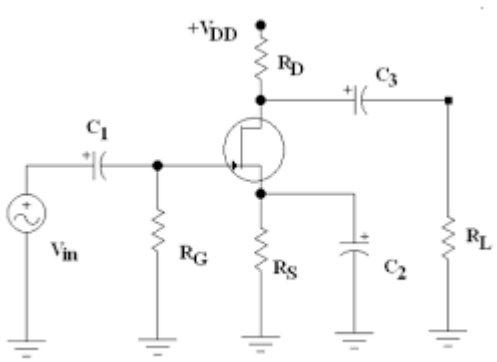
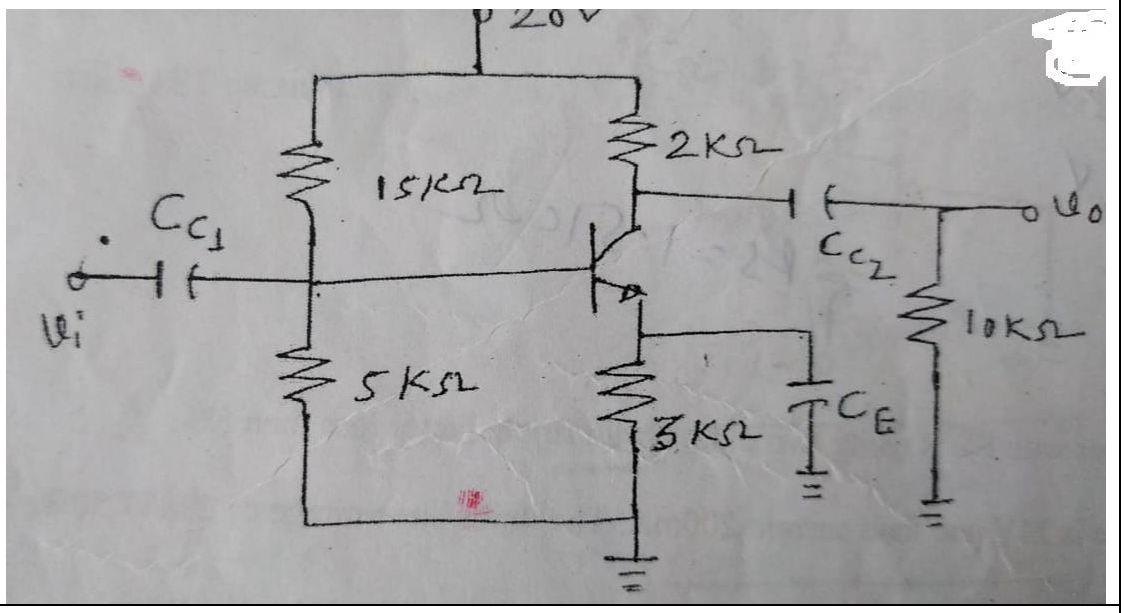
Note to the students: - All the Questions are compulsory and carry equal marks.

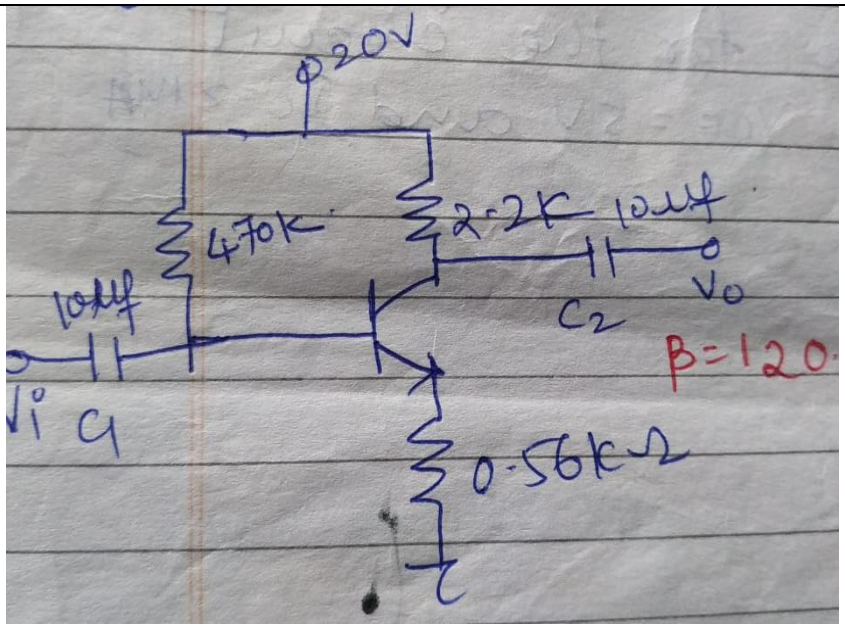
Q1.	If the temperature of a diode increases, then leakage current …….. and Base emitter voltage…….. .
Option A:	Increases, Increases
Option B:	Decreases, decreases
Option C:	Decreases, Increases
Option D:	Increases, decreases
Q2.	Load Regulation should be _____ and Line Regulation should be _____ for good power Supply.
Option A:	as low as possible, as high possible
Option B:	as low as possible, as low possible
Option C:	as high as possible, as high possible
Option D:	as high as possible, as low possible
Q3.	In class B push pull Power Amplifier deliver 8W of audio power to output load if transformer efficiency 80%. Calculate Pidc
Option A:	12.73W
Option B:	11.31W
Option C:	13.4W
Option D:	11.13W

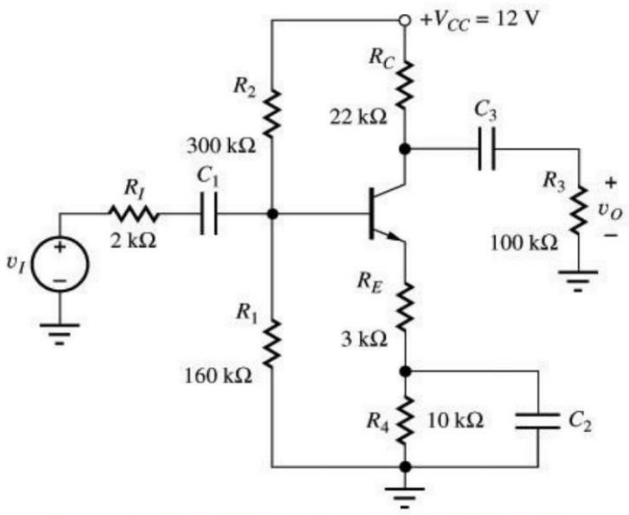
Q4.	Heat sink is used in Power transistor to
Option A:	Increase Maximum Power dissipation rating of transistor
Option B:	Decrease Maximum Power dissipation rating of transistor
Option C:	No change in maximum power dissipation rating of transistor
Option D:	Increase/Decrease Maximum Power dissipation rating of transistor
Q5.	Calculate IB base current and Ic collector current Vcc=9V RB = 330KΩ RC = 1K Ω, β = 100 for fixed bias circuit.
Option A:	25.15µA ,2.5mA
Option B:	2.5µA,2.5mA
Option C:	25.15µA,25.15mA
Option D:	2.6 µA,26mA
Q6.	Calculate the total input capacitance, if amplifier has midrange voltage gain 80, the transistor's Cbc is 4pfand Cbe = 8pf.
Option A:	332pf
Option B:	4pf
Option C:	8pf
Option D:	232pf
Q7.	For a given circuit if CE capacitor is removed, what is an effect on voltage gain and input impedance. 

Option A:	Voltage gain increases, Input impedance increases
Option B:	Voltage gain decreases, Input impedance increases
Option C:	Voltage gain increases, Input impedance decreases
Option D:	Voltage gain decreases, Input impedance decreases
Q8.	For a given Amplifier Calculate voltage gain, IDSS=7mA, Vp=-2.5V Vgs =1.6V,gm0=5600µs,Rg=1MΩ,Rd=2KΩ,RL=10KΩ 
Option A:	-3.36
Option B:	4.032
Option C:	20.16
Option D:	5.06
Q9.	Calculate output resistance of an amplifier circuit. (use circuit of Q.8)
Option A:	10KΩ
Option B:	1.667KΩ
Option C:	2kΩ
Option D:	Infinite
Q10.	In class A Power Amplifier power dissipation in transistor under no signal condition is _____.
Option A:	Less

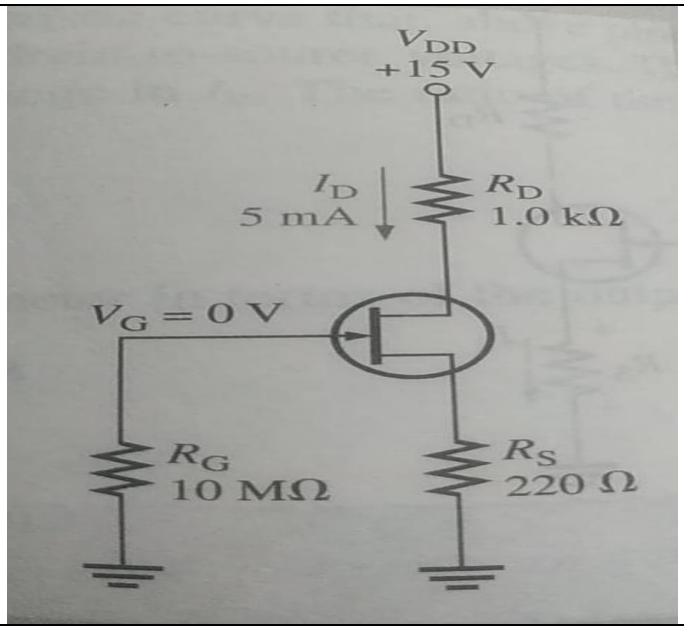
Option B:	More
Option C:	Twice the power dissipation under signal condition
Option D:	Same as Power dissipation under signal condition
Q11.	In CE amplifier RE bypassed if load resistor is given, Voltage gain is given by
Option A:	βRC /rπ
Option B:	-β(RC||RL) /rπ
Option C:	-βRC /rπ
Option D:	-βRC / (rπ ||RL)
Q12.	Q point is affected by temperature. Temperature dependent parameters are
Option A:	**β**
Option B:	VBE
Option C:	ICBO, **β**
Option D:	VBE,ICBO, **β**
Q13.	BJT is current controlled device
Option A:	IC current depends on IB current
Option B:	IB current depends on IC current
Option C:	IC current depends on VBE voltage
Option D:	IB current depends on VBE voltage
Q14.	To use MOSFET as an amplifier, it should be biased in
Option A:	Saturation Region
Option B:	Ohmic region
Option C:	Linear region
Option D:	Cut off region

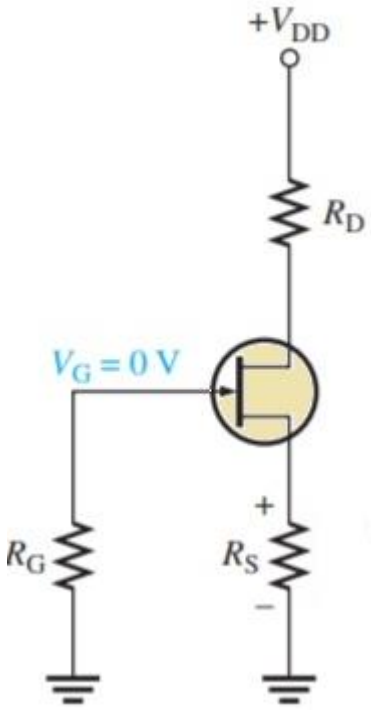
Q15.	For a given Amplifier, calculate voltage gain of an amplifier. rπ = 1.5KΩ, β = 120 
Option A:	184.61
Option B:	800
Option C:	160
Option D:	190
Q16.	For N channel MOSFET IDQ =1mA, Kn = 0.85mA/V2, VTN = 0.8V, Find VGS.
Option A:	1.88V
Option B:	2.3V
Option C:	0.8V
Option D:	0V
Q17.	Calculate IB for a circuit shown

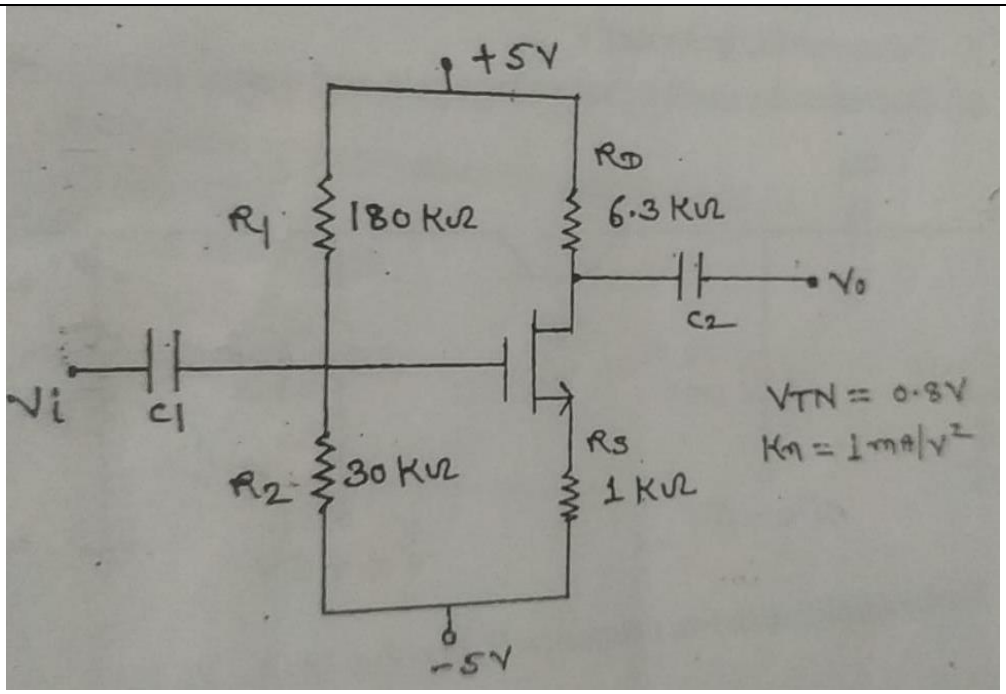
	
Option A:	33.125µA
Option B:	33.125mA
Option C:	6.625mA
Option D:	6.625 µA
Q18.	Calculate stability factor for given specifications Vcc=9V RB = 330KΩ RC = 1K Ω, β = 100 for fixed bias circuit.
Option A:	1
Option B:	Infinite
Option C:	100
Option D:	101
Q19.	CMRR can be improved by
Option A:	Increasing differential gain
Option B:	Decreasing differential gain.
Option C:	Increasing common mode gain
Option D:	Decreasing common mode gain

Q20.	Calculate lower cut-off frequency F_{LC3} if C_3=1µf for a given circuit. 
Option A:	0HZ
Option B:	1.3HZ
Option C:	3.1HZ
Option D:	∞HZ

Q.2 (A)(i)	Explain Frequency response of an amplifier and its significance. For a given circuit if CE capacitor is removed, what is an effect on voltage gain and input impedance.
Q.2 (A)(ii)	For Zener voltage regulator output voltage is 9V from an automobile battery whose voltage may vary between 11V and 13.6V. The current vary between 0mA to 100mA.Find Rs resistor and Pzmax.
Q.2 (A)(iii)	Find VGS, VDS for given circuit if ID = 5mA. Figure is shown below

	
Q.2 (B) (i)	In class B power Amplifier VCC=20V, N2=2N1, RL=20Ω.The input is sinusoid for maximum output signal at Vmax=VCC determine (i) Output signal power (ii) Collector dissipation in each transistor
Q.2(B) (II)	Derive voltage gain Av, current gain Ai, input resistance Ri and output resistance of CE amplifier RE bypassed.

Q.3(A)(i)	State and explain Miller's Theorem.
Q.3 (A)(ii)	For the circuit shown find ID and VDS if VRS=1.5V, RD=2kΩ, RG=1MΩ, VDD=15V, IDSS=10mA, Vp=-2V 
Q.3 (A)(iii)	In audio system speaker needs 10Watt of output power, calculate $P_Q$max for transistor for Class A and Class B Power Amplifier. Select a suitable Power Amplifier for Audio system. Give Justification for the answer.
Q.3 (B) (i)	Explain two transistor(E-MOSFET) constant current source and importance of CMRR.
Q.3(B) (II)	Determine voltage gain, Input resistance and output resistance for the MOSFET amplifier shown, VTN=0.8V, Kn=1mA/V2.


+5V
R_D
R_1
180 KΩ
6.3 KΩ
V_o
C_2
V_i
C_1
$V_{TN} = 0.8V$
$K_n = 1 mA/V^2$
R_S
R_2
30 KΩ
1 KΩ
-5V