

Course Name: Electrical and Electronics Engineering

- CO1- Be familiar with electrical quantities such as current, voltage, power, energy, and frequency to understand the impact of technology in a global and societal context.
 CO2- Understand basics of DC and AC circuits used in electrical devices.
 CO3- Be familiar with the principle and theory of semiconductor materials.
 CO4- To facilitate understanding of Diodes, BJT, MOSFET and Operations Amplifiers.

Printed Pages: 03

University Roll No.

End Term Examination, Even Semester 2021-22
B.Tech(Hons.)-CSE, I Year, II Semester
BECG 0004 Electrical and Electronics Engineering

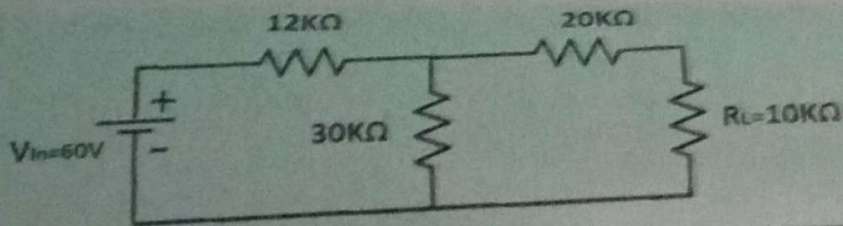
Time: 3 Hours

Maximum Marks: 45

Section – A

Attempt All Questions

4 X 5 = 20 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	<p>For the circuit shown, find V_{TH}, R_{TH}, load current I_L and load voltage across the load resistor by using Thevenin's Theorem.</p> 	4	CO1	A	P
2	<p>A solenoid with an inductance of 10mH and resistance of 5Ω are connected to the terminals of a 5-V battery in series. There is also a switch in the circuit. (a) Immediately after the switch is closed, find the potential drop across the resistor. (b) Find the final current in the circuit. (c) Find the time constant of the circuit. (d) Find the current after one-time constant has elapsed.</p> <p style="text-align: center;">OR</p> <p>For the circuit shown, find the current flowing through $3K\Omega$ resistor using superposition theorem</p>	4	CO2 CO1	U	P

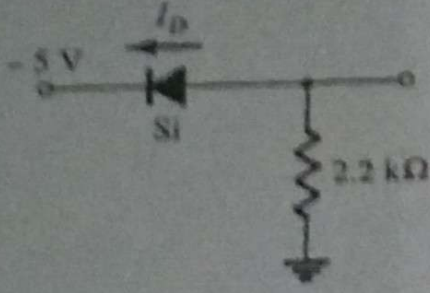
3	Briefly explain the operation of Common Base transistor configuration. Draw its input and output characteristics. Also explain various operating regions of the transistor.	4	CO4	R	C
4	Draw the circuit of parallel biased clipper and explain its operation with the help of suitable input-output waveforms.	4	CO4	R	C
5	A Full wave bridge rectifier circuit has load resistance of 480Ω and forward diode resistance of 20Ω . Input voltage applied to this rectifier is $V_{in} = 100\sin 314t$. Determine: (a) Peak value of current (b) average or dc value of current (c) ripple factor (d) rectifier efficiency.	4	CO4	A	P

Section – B

Attempt All Questions

3 X 5 = 15 Marks

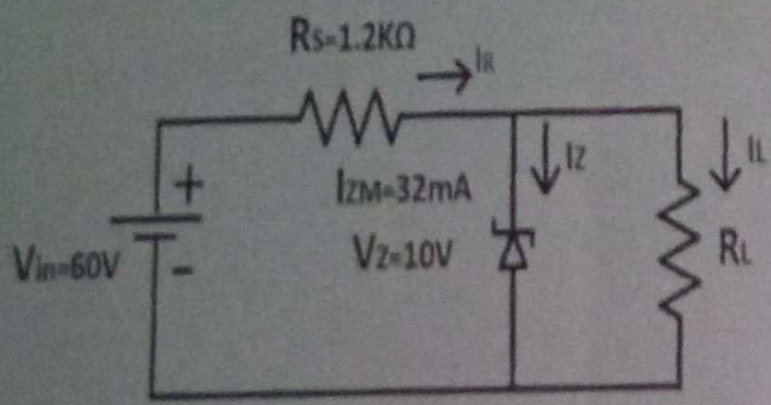
No.	Detail of Question	Marks	CO	BL	KL
1	Explain the working of N-channel Depletion type MOSFET. Also draw its drain and transfer characteristics.	3	CO4	R	C
2	The current flowing in a diode is $2 \times 10^{-7} \text{A}$ at room temperature, when a reverse voltage is applied. Calculate current through diode when a forward bias of 0.1V is applied across diode at room temperature.	3	CO4	A	P
3	Find the concentration of holes and electrons in a N-type Silicon, if the conductivity is $0.125 (\Omega\text{-cm})^{-1}$. Given for Silicon $n_i = 1.5 \times 10^{10} / \text{cm}^3$; $\mu_n = 1300 \text{ cm}^2/\text{V-s}$; $\mu_p = 500 \text{ cm}^2/\text{V-s}$.	3	CO3	R	P

4	<p>Determine I_D and voltage across $2.2\text{K}\Omega$ resistance for the networks shown below</p> 	3	CO4	A	C
5	<p>Explain CMRR, Slew Rate and input offset Voltage in context of operational amplifier.</p>	3	CO4	U	C

Section – C

Attempt All Questions

5 X 2 = 10 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	<p>Draw the circuit of Differentiator, Design a circuit using operational amplifier to implement the function: $Y = V_1 + V_2 - V_3$</p>	5	CO4	A	P
2	<p>For the network shown below, Determine the range of R_L and I_L that will result in V_{RL} being maintained at 10V. Also determine the maximum wattage rating of the diode.</p> 	5	CO4	A	P