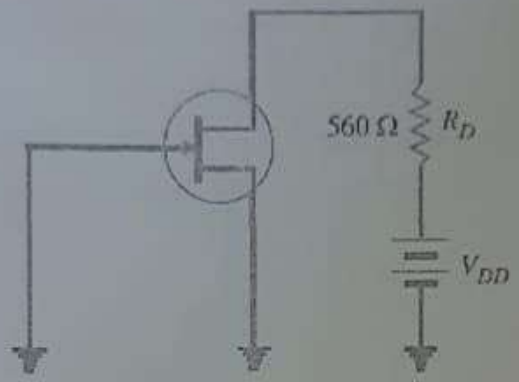
Q4 (a) What are the types of possible configurations in BJT. Derive the relation between α, β and γ. [3] CO2 BL1

Q4 (b) In a fixed biased circuit of CE-transistor, V_{cc} = 15 V, R_B = 820 KΩ, R_C = 4.7 KΩ, V_{BE} = 0.7 V and β = 120. Draw the DC load line and locate the operating point. [2] CO2 BL4

Q5 (a) With a neat sketch, explain the operation of n-channel enhancement type MOSFET. [3] CO2 BL2

Q5 (b) For the JFET in Figure, VGS (off) = - 4V and IDSS = 12 mA. Determine the minimum value of VDD required to put the device in the constant-current region of operation. [2] CO2 BL2



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BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BTECH
BRANCH: CSE/ECE/EEE/AI & ML

SEMESTER: I
SESSION: MO/2022

SUBJECT: EC101 BASICS OF ELECTRONICS AND COMMUNICATION ENGINEERING

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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			CO	BL
Q1 (a)	Describe the operation of Zener Diode based voltage regulator with a suitable circuit diagram.	[3]	CO1	BL2
Q1 (b)	In the following Fig.1, If Germanium (Ge) diode connection (direction) is reversed, the value of output voltage (Vo) changes by how much volts? (Assume that the Ge diode has large breakdown voltage).	[2]	CO1	BL4

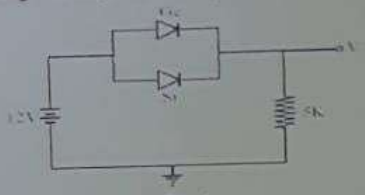

Fig. 1

Q2 (a)	Draw the circuit of diode based Half Wave Rectifier (HWR) and Derive the expressions for average and RMS voltage for HWR.	[3]	CO1	BL1
Q2 (b)	A full wave rectifier produces a rms voltage of 10 V from a 50 Hz line source and feeds a resistive load of 1100 Ω. If the filter uses a capacitor of C = 50 μF, calculate the output dc voltage and ripple voltage.	[2]	CO1	BL4
Q3 (a)	Explain Base-width Modulation Effect in BJT using suitable diagram.	[3]	CO2	BL2
Q3 (b)	Find the Quiescent-point voltage and current values for voltage divider configuration shown (Fig2)	[2]	CO2	BL4

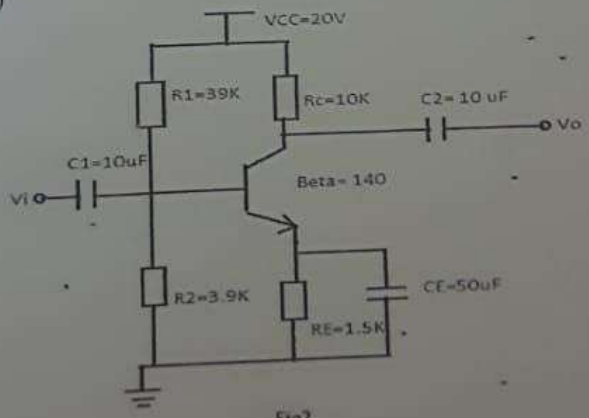

Fig2

PTO