Enrollment No 242801060103O

BHAGWAN MAHVIR UNIVERSITY

B.TECH SEMESTER I/II EXAMINATION SUMMER 2025

Subject Code: 2010204201 **Date: 14/6/2025**

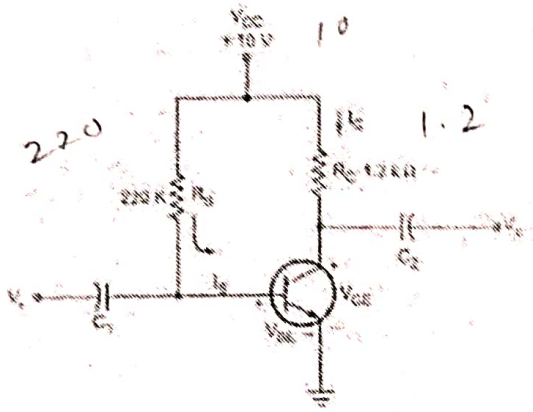
Subject Name: Basic Electronics - Theory

Time: 2:00PM TO 4.30PM **Total Marks: 60**

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

			Marks
Q.1	(a)	Define following terms: Pentavalent atoms, Bulk resistance	02
	(b)	Draw and explain VI characteristics of Silicon diode.	04
	(c)	Explain bridge rectifier using circuit diagram, waveforms and required derivation.	06
Q.2	(a)	Differentiate between varactor and varistor diode.	02
	(b)	What is Zener breakdown? Why Zener diode is used as a Voltage Regulator?	04
	(c)	Explain all types of unbiased Clipper circuit with appropriate waveforms.	06
		OR	
	(c)	Explain LED and Photo Diode with necessary circuit diagram.	06
Q.3	(a)	Draw the construction and symbol of NPN and PNP transistor.	02
	(b)	Explain Common Emitter configuration (CE) of transistor in detail with necessary derivation, input characteristic and output characteristic.	04
	(c)	Explain Voltage Divider Bias circuit in detail with necessary circuit diagram and derivation of the equations of Q point.	06
		OR	
Q.3	(a)	Give details of different operating region of transistor.	02
	(b)	Explain in detail Stability factors.	04
	(c)	For the circuit shown in figure. Calculate I_B, I_C, V_{CE}, V_B, V_C. Assume V_{BE} = 0.3V and β = 100.	06



Q.4	(a)	Explain importance of coupling and bypass capacitor in transistor amplifier circuit.	02
	(b)	Establish the relationship between current gain α, β and γ.	04
	(c)	Derive expression of input impedance, output admittance, voltage gain for CC amplifier.	06
		OR	
Q.4	(a)	What do you mean by faithful amplification? Explain effect of shifting Q point towards cutoff and saturation region.	02

	(b)	Draw and explain h parameter model for CE amplifier.	04
	(c)	Derive expression of input impedance, output admittance, and voltage gain for CB amplifier.	06
Q.5	(a)	Give difference between MOSFET and JFET.	02
	(b)	Differentiate between AC and DC load line.	04
	(c)	Explain the concept DC Load line and Operating point Q. Also derive the equation of operating point Q for CE configuration.	06

OR

Q.5	(a)	What is the depletion mode MOSFET?	02
	(b)	Define: Fan in, Fan out, Noise margin, propagation delay time.	04
	(c)	Explain CMOS inverter with circuit diagram and input output graph.	06