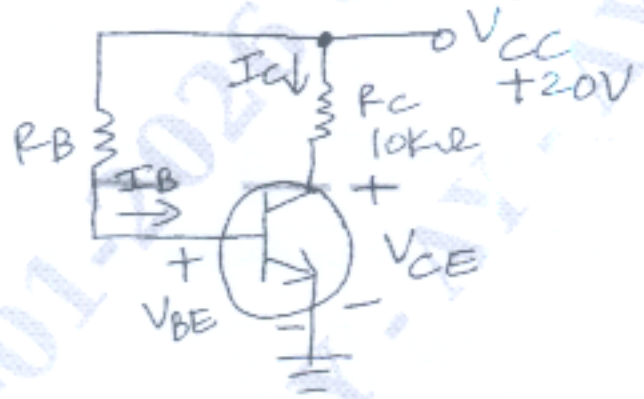
CBCS SCHEME

BBEE103/203

First/Second Semester B.E/B.Tech. Degree Examination, Dec.2025/Jan.2026
Basic Electronics

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Explain the forward and reverse characteristics of a PN junction diode.	8	L2	CO1
	b.	Explain the working of Zener diode as a voltage regulator.	7	L2	CO1
	c.	A diode with V_F = 0.7V is connected as a half wave rectifier. The load resistance is 500Ω and the (rms) AC input is 22V. Determine the peak output voltage, the peak load current and the diode peak reverse voltage.	5	L3	CO1
		OR			
2	a.	Explain the working of full wave rectifier reservoir capacitor circuit with waveforms.	8	L2	CO2
	b.	Explain the DC load line analysis of a PN junction diode.	7	L2	CO1
	c.	A Zener diode with V_Z = 4.3V has Z_Z equal to 22Ω when I_Z = 20mA. Calculate the upper and lower limits of V_Z when I_Z changes by ±5mA.	5	L3	CO1
		Module – 2			
3	a.	Draw the DC Load line for the circuit shown in Fig.Q3(a), when R_C = 12KΩ.  Fig.Q3(a)	5	L3	CO2
	b.	Explain the working of BJT as an amplifier.	7	L2	CO2
	c.	Explain the common emitter input and output characteristics.	8	L2	CO2
		OR			
4	a.	Explain the construction, working and characteristics of an n-channel depletion – enhancement MOSFET.	10	L2	CO2
	b.	Explain the construction, working and characteristics of on n–channel JFET.	10	L2	CO2

		Module – 3			
5	a.	List the ideal characteristics of an Op-Amp.	5	L2	CO2
	b.	Explain the following Op-Amp parameters. i. Input offset current ii. Slew rate iii. PSRR iv. CMRR.	8	L2	CO2
	c.	Explain the operation of Op-Amp with the help of a block diagram.	7	L2	CO2
		OR			
6	a.	Design on adder circuit using Op-Amp to obtain an output voltage, $V_0 = -[2V_1 + 3V_2 + 5V_3]$, Assume $R_F = 10\ K\Omega$.	6	L3	CO2
	b.	Explain the working of Op-Amp as a non-inverting operational amplifier.	7	L2	CO2
	c.	Explain the working of Op-Amp as an integrator.	7	L2	CO2
		Module – 4			
7	a.	State and prove Demorgan's theorem.	4	L2	CO3
	b.	Perform the following conversions : i. $(1234.56)_8 = (?)_{10}$ ii. $(10110101001.101011)_2 = (?)_{16}$ iii. $(988.86)_{10} = (?)_2$ iv. $(532.65)_{10} = (?)_{16}$ v. $(ABCD.EF)_{16} = (?)_8$.	10	L3	CO3
	c.	Subtract using 2's complement representation. $(15)_{10} - (28)_{10}$.	6	L3	CO3
		OR			
8	a.	Simplify the following Boolean expression : $\overline{XY + XYZ + X(Y + X\overline{Y})}$.	6	L3	CO3
	b.	Explain the following gates : i) X – NOR ii) NAND iii) OR.	6	L2	CO3
	c.	Explain the working of full adder with circuit diagram and truth table.	8	L2	CO3
		Module – 5			
9	a.	Explain the elements of a communication system.	8	L2	CO4
	b.	Explain the working of Resistive transducer with neat circuit diagram.	7	L2	CO5
	c.	Explain about thermal transducers.	5	L2	CO5
		OR			
10	a.	Explain the working of piezoelectric transducer with circuit diagram.	8	L2	CO5
	b.	Explain about inductive transducers.	6	L2	CO5
	c.	Define Modulation. Explain the need for modulation.	6	L2	CO4

* * * * * *