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CBCS SCHEME

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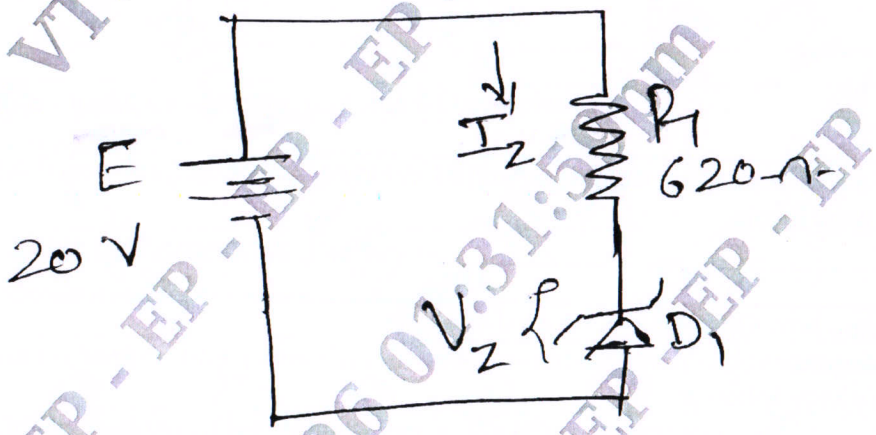
BBEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, June / July 2026

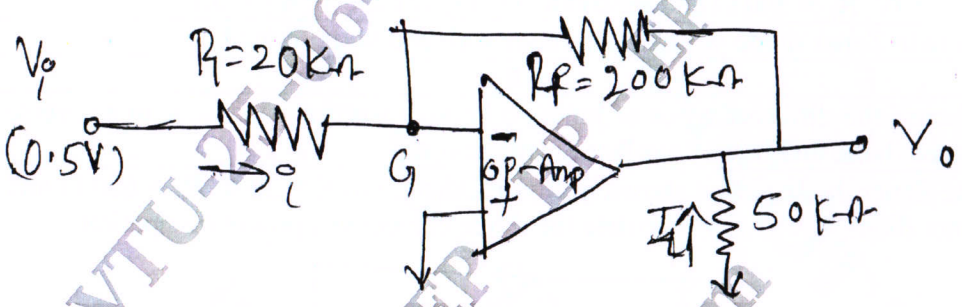
Basic Electronics for EEE Stream

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
Q.1	a.	With a neat sketch of VI characteristics of PN junction diode, explain forward and reverse characteristics of it.	07	L2	CO1
	b.	Determine the peak output voltage and current for the bridge rectifier having $V_i = 30V$ $R_L = 300\ \Omega$ and the diode having voltage of $V_F = 0.7$ V.	06	L2	CO1
	c.	Explain Zener diode voltage Regulator with and without load.	07	L2	CO1
		OR			
Q.2	a.	Discuss the different types of junction breakdown that can occur in a reverse biased diode and briefly explain its operation.	06	L2	CO1
	b.	The Zener diode circuit shown in figure Q2(b), has E = 20 V $R_1 = 620\ \Omega$ and zener diode $V_2 = 7.5$ V calculate the diode current and power dissipation.  Fig.Q 2 (b)	06	L3	CO1
	c.	Describe the working of full wave rectifier, with a neat circuit diagram and necessary waveforms.	08	L2	CO1
		Module – 2			
Q.3	a.	Explain the output characteristics of a transistor in common Emitter configuration.	06	L2	CO2
	b.	With a neat diagram, explain the construction working and characteristics of N – channel JFET.	08	L2	CO2
	c.	Calculate I_C & I_E for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100\ \mu A$. Also determine the value of β_{dc} for the transistor.	06	L3	CO2
		OR			
Q.4	a.	Explain the enhancement type MOSFET along with the drain characteristics.	08	L2	CO3
	b.	Discuss the common Emitter input and output characteristics.	06	L2	CO3
	c.	Draw the DC Load line for transistor and identify Q points.	06	L2	CO3

Module – 3

Q.5	**a.**	Define the terms with respect to Op – Amp i) Slew rate ii) CMRR iii)SVRR iv) Common mode gain Acm v) Virtual ground vi) Offset voltage vii) Bandwidth	**07**	**L2**	**CO2**
	b.	An inverting Amplifier shown in fig.Q.5 (b) below has a load resistor of 50 KΩ connected to its outputs. If the input voltage is 0.5 V, find the load current, output voltage and input currents.  Fig.Q 5 (b)	**06**	**L3**	**CO2**
	c.	Explain the operation of an Op-Amp as inverting Amplifier with neat diagram and waveforms.	**07**	**L2**	**CO2**
		OR			
Q.6	**a.**	Explain how Op-Amp can be used as : i) Integrator ii) Voltage follower.	**08**	**L2**	**CO2**
	b.	What is an Op-Amp? List the characteristics of an ideal Op – Amp.	**06**	**L2**	**CO**
	c.	With a neat block diagram explain the Operational Amplifier.	**06**	**L2**	**CO2**
		Module – 4			
Q.7	**a.**	State and prove DC - Morgan's theorem using suitable Truth table.	**04**	**L2**	**CO4**
	b.	i) Perform the following using 1's complement a) 1111 – 1011 b) 110011 – 100101 ii) Perform the following using 2's complement a) 10111 -10011 b) 1101 – 1001	**08**	**L3**	**CO4**
	c.	Design full circuit, write expression for sum and carry with suitable truth table.	**08**	**L2**	**CO4**

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OR

Q.8	**a.**	Perform the following operations. i) $(ABCD)_{16} = (\quad)_2 = (\quad)_8$ ii) $(IC00)_{16} = (\quad)_8$ iii) $(532.65)_{10} = (\quad)_{16} = (\quad)_2$ iv) $(B4D)_{16} = (\quad)_2$ v) $(7AF4)_{16} = (\quad)_2$ vi) $(11010.01101)_2 = (\quad)_{16}$	**08**	**L3**	**CO4**
	b.	Simplify the following using Boolean Algebra. i) $Y = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,B\,\overline{C} + A\,\overline{B}\,\overline{C}$ ii) $Y = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,B\,\overline{C} + A\,\overline{B}\,\overline{C} + A\,\overline{B}\,\overline{C}$ iii) $Y = (A + B)\ (A + \overline{B})\ (\overline{A} + B)$ iv) $Y = A \oplus B \oplus C$	**08**	**L3**	**CO4**
	c.	Write the symbol and truth table of the following gates : i) AND ii) NOR iii) XOR iv) NAND	**04**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	What is modulation? Explain the need for modulation.	**06**	**L2**	**CO5**
	b.	Explain the working of Linear Variable Differential Transducer (LVDT).	**08**	**L2**	**CO5**
	c.	Write a note on Piezoelectric Transducer.	**06**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the various blocks involved in an electrical communication system.	**06**	**L2**	**CO5**
	b.	Explain the working of the Potentiometric Resistive Transducer.	**08**	**L2**	**CO5**
	c.	Differentiate between AM and FM.	**06**	**L2**	**CO5**

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