Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Make up Examinations – December 2025

Date: 31 – 12- 2025 **Time:** 09:30am – 12:30pm

School: SOE	**Program:** B.TECH	
Course Code:ECE1001	**Course Name:** ELEMENTS OF ELECTRONICS	
Semester: MK	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	26	24	24	

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

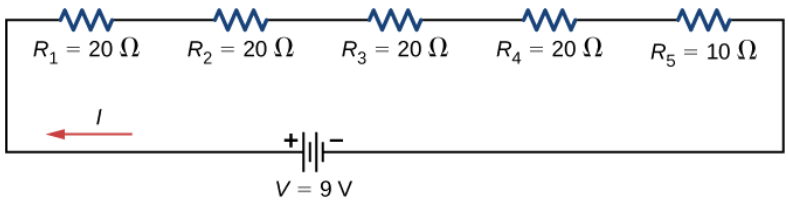
Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Resistors don't need an external power source to function. They use some other property to control the electrical signal. Resistor is an _____ component or device.	**2 Marks**	**L2**	**CO2**
2.	The parameters of the diode explain about the operation of the diode in forward bias and reverse bias conditions. The voltage at which the current increases rapidly is called as _____ and the current produced in reverse bias is called as _____.	**2 Marks**	**L1**	**CO1**
3.	Identify and describe the working of basic electronic components used in rectifier circuits.	**2 Marks**	**L2**	**CO2**
4.	Identify the three regions of operation in a Bipolar Junction Transistor (BJT).	**2 Marks**	**L2**	**CO1**
5.	A semiconductor diode operates with a minimum knee voltage of _____ for Ge and _____ for Si.	**2 Marks**	**L2**	**CO3**
6.	A water heater carries current of 18A from a 230V source for 15 hours. Calculate the energy consumed in kilowatts hours.	**2 Marks**	**L1**	**CO3**

7.	Logic gates are the basic building blocks of any digital system. It is an electronic circuit having one or more than one input and only one output. The relationship between the input and the output is based on a certain logic. Based on this, logic gates are named as AND gate, OR gate, NOT gate etc. The inputs of a NAND gate are connected together. The resulting circuit is _____.	**2 Marks**	**L1**	**CO4**
8.	In a common base connection, I_E = 1mA, I_C = 0.95mA. Calculate the value of I_B .	**2 Marks**	**L1**	**CO4**
9.	_____ and _____ gates are classified as universal gates. These gates are called "universal" because they can be combined to create any other logic gate, such as AND, OR, and NOT, making them versatile building blocks for digital circuits. .	**2 Marks**	**L1**	**CO1**
10.	Number system conversion involves changing a number from one base (or radix) to another. X_2=(11101) find $Y_{10.}$	**2 Marks**	**L1**	**CO2**

Part B

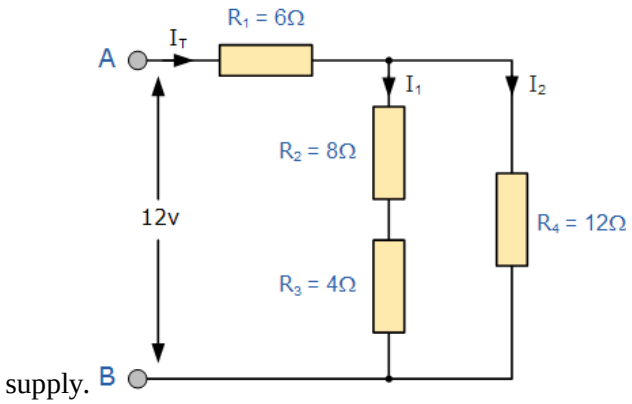
Answer the Questions. **Total Marks 80M**

11.	**a.**	A battery with a terminal voltage of 9 V is connected to a circuit consisting of four 20Ω and one 10Ω resistors all in series • Calculate the equivalent resistance of the circuit. • Calculate the current through each resistor. • Calculate the potential drop across each resistor. • Determine the total power dissipated by the resistors and the power supplied by the battery. 	**10 Marks**	**L2**	**CO 1**
	b.	An a.c. voltage of peak value 20 V is connected in series with a silicon diode and load resistance of 500 Ω. If the forward resistance of diode is 10 Ω, find : (i) peak current through diode (ii) peak output voltage What will be these values if the diode is assumed to be ideal ?	**10 Marks**	**L3**	**CO 1**
		Or			
12.	**a.**	Modulation is the process of encoding information onto a carrier signal, while demodulation is the reverse process of extracting that information from the carrier signal. Explain the different types of modulation.	**10 Marks**	**L2**	**CO 1**
	b.	The 8085 is an 8-bit microprocessor developed by Intel. It was widely used in various applications, especially in embedded systems and early personal computers. Explain the pin diagram of 8085 microprocessor.	**10 Marks**	**L2**	**CO 1**

13.	**a.**	A diode is a two-terminal electronic component that conducts electric current primarily in one direction (asymmetric conductance).Identify and explain the key parameters associated with the V-I characteristics of a diode.	**10 Marks**	**L1**	**CO 2**
	b.	A 6.0V stabilised power supply is required to be produced from a 12V DC power supply input source. The maximum power rating P_Z of the zener diode is 2W. Using the zener regulator circuit above calculate:	**10 Marks**	**L3**	**CO 2**
		Or			
14.	**a.**	Biasing a PN junction diode involves applying an external voltage to control the direction of current flow. Analyze the behavior of semiconductor devices under different biasing conditions.	**10 Marks**	**L1 2**	**CO 2**
	b.	A Zener diode is a type of diode designed to exploit the Zener effect to affect electric current to flow against the normal direction from anode to cathode.Explain the working of zener diode as voltage regulator.	**10 Marks**	**L2**	**CO 2**

15.	**a.**	A communication system is a collection of components that transmit information from a sender to a receiver. Explain the block diagram of communication system.	**10 Marks**	**L2**	**CO 3**
	b.	FULL-wave rectifiers transform AC voltage to DC voltage. Illustrate the operation of FULL rectifier circuits and evaluate their performance parameters. Also draw the wave forms.	**10 Marks**	**L2**	**CO 3**
		Or			
16.	**a.**	A half-wave rectifier **converts an AC signal to DC** by passing either the negative or positive half-cycle of the waveform and blocking the other. Illustrate the operation of HALF rectifier circuits and evaluate their performance parameters.	**10 Marks**	**L3**	**C3 O**
	b.	An n-p-n transistor at room temperature has its emitter disconnected. A voltage of 5 V is applied between collector and base. With collector positive, a current of 0.2 μA flows. When the base is disconnected and the same voltage is applied between collector and emitter, the current is found to be 20 μA. Find α, I_E and I_B when collector current is 1 mA.	**10 Marks**	**L3**	**CO 3**

17.	**a.**	A Bipolar Junction Transistor (BJT) is a three-terminal semiconductor device used as an amplifier or switch. Explain the operation of a Bipolar Junction Transistor (BJT) as an amplifier.	**10 Marks**	**L3**	**CO 4**

	b.	In the following circuit calculate the total current (I_T) taken from the 15v supply. 	**10 Marks**	**L3**	**CO 4**
		Or			
18.	**a.**	1. Prove that A + A·B = A 2. Prove (A + B)·(A + C) = A + B·C	**10 Marks**	**L3**	**CO 4**
	b.	Convert the following: i. $(232)_{10}=(?)_{16}$ ii. $(346)_{10}=(?)_{8}$ iii. $(ACA)_{16}=(?)_{10}$	**10 Marks**	**L3**	**CO 4**