PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester I - 2023
Course Code : ECE1001
Course Name : Sem I - ECE1001 - Elements of Electronics Engineering
Program : B. TECH

Date : 31-OCT-2023
Time : 11:30AM - 1:00PM
Max Marks : 50
Weightage : 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS   **(5 X 2 = 10M)**

1. Resistor is a passive device which resists the flow of current through it .The color coding in a certain resistor is found to be 1st band=red, 2nd band=black, 3rd band=yellow, 4th band=gold. Calculate the value of the resistor with its tolerance range.

    (CO1) [Knowledge]

2. A water heater carrys a current of **12A** from a **230V** source for **15hours**.calculate the energy consumed in Kilowatt hours.

    (CO1) [Knowledge]

3. The parameters of the diode explains about the operation of the diode in forward and reverse bias conditions. The voltage at which forward bias current increases rapidly is called as _____ and the current produced in reverse-bias is called as _____.

    (CO1) [Knowledge]

4. The AC component in a rectifier circuit is removed using a filter circuit.--------------------is the component used as a smoothening filter.

    (CO2) [Knowledge]

5. Half-wave rectifiers transform AC voltage to DC voltage. List the components in half wave rectifier.

    (CO2) [Knowledge]

ANSWER ALL THE QUESTIONS   **(2 X 10 = 20M)**
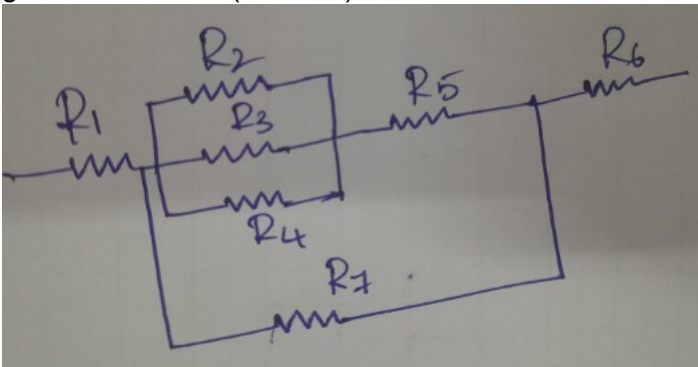
6. The output waveform of a halfwave rectifier is a pulsating DC waveform. Filters in halfwave rectifiers are used to transform the pulsating waveform into constant DC waveforms. A capacitor can be used as a filter. Design a half wave rectifier with capacitor filter and draw the expected waveforms.

                                                                    (CO2) [Comprehension]

7. The **V-I** characteristics of a **P-N** junction diode is a curve between the voltage and current through the circuit. The parameters in the **V-I** curve explains about the diode .List out and explain in detail all the parameters in the **V-I** characteristics of a diode .

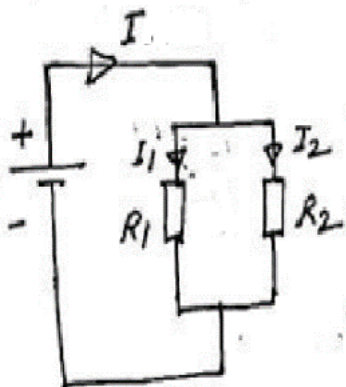   (CO1) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION   **(1 X 20 = 20M)**

8.

   a) Raju has a silicon diode working at a temperature of **45degree C.** If **0.7v** is the forward voltage applied across the diode with a reverse saturation current as **28nA**,calculate the forward diode current **with** ideality factor as **2**.(7 marks).

   b) Chaishvi is working on an analog circuit in which an equivalent Resistor should be used in place of given circuit. In a series circuit, the output current of the first resistor flows into the input of the second resistor; therefore, the current is the same in each resistor. In a parallel circuit, all of the resistor leads on one side of the resistors are connected together and all the leads on the other side are connected together. Calculate the equivalent resistance value across the given circuit if all resistor values are given as **5 ohms**.(7 marks).

   c) Disha is a student working for a project which has a circuit shown in the circuit below. Prototype circuit is made on the bread board. Help her to estimate branch currents (**I1,I2**)and the voltage required if **R1=5 ohms ,R2=10 ohms,I=4amps.** (6 marks)

                                                                    (CO1) [Application]