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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
MID TERM EXAMINATION - OCT 2023**

**Semester :** Semester I - 2023

**Course Code :** ECE1006

**Course Name :** Sem I - ECE1006 - Basic Electronics Engineering

**Program :** B. TECH

**Date :** 31-OCT-2023

**Time :** 11:30AM - 1:00PM

**Max Marks :** 50

**Weightage :** 25%

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**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.
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**PART A**

**ANSWER ALL THE QUESTIONS**

**(5 X 2 = 10M)**

1. Intrinsic semiconductor behaves like insulator, to increase the conductivity of these semiconductor an impurities are added. Intrinsic semiconductor are made extrinsic by doping..... and ..... type of impurities.  
(CO1) [Knowledge]
2. Color coding is a technique to find out the value of the resistor. Saurabh needs a resistance of 10KΩ with 20% tolerance. What is the color coding for it.  
(CO1) [Knowledge]
3. Silicon diode is having higher temperature coefficient than germanium diode. A Silicon diode working at 25°C with its reverse saturation current as 10μA and forward voltage of 0.8V with  $\eta=2$ . Determine the forward current flowing through the diode.  
(CO1) [Knowledge]
4. Capacitor is used as a filter in rectifier circuit. The charging time should be ..... than discharging time.  
(CO1) [Knowledge]
5. Zener Diode is always connected in parallel to the load resistance. It is mainly used as \_\_\_\_\_.  
(CO1) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(2 X 10 = 20M)**

6. (i) A half-wave rectifier is used in soldering iron types of circuits and is also used in mosquito repellent to drive the lead for the fumes. Design a half wave rectifier with waveform which can be built using a step-down transformer with  $N_1$  and  $N_2$  turns and a diode  $D$  connected with load resistor  $R$ . (5 Marks)

(ii) A Zener diode is a silicon semiconductor device that permits current to flow in either a forward or reverse direction. Explain in detail with the required equations the working of zener diode as shunt voltage regulator. (5 Marks)

(CO1) [Comprehension]

7. i) Mita works in LED TV manufacturing company, help her in designing the a full wave bridge rectifiers which will be suitable for LED TV with a step down transformer and suitable use the required number of diodes and resistors required and explain how it works with relevant waveforms and circuit diagram. (5Marks)

ii) A Zener diode is a silicon semiconductor device that permits current to flow in either a forward or reverse direction. Elucidate the working of zener diode as voltage regulator with required equations. (5Marks)

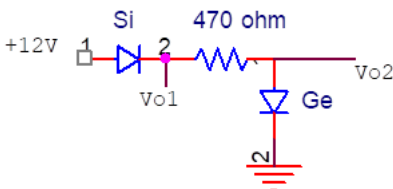
(CO1) [Comprehension]

**PART C**

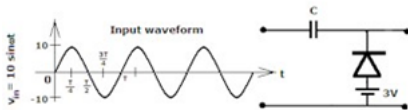
**ANSWER THE FOLLOWING QUESTION**

**(1 X 20 = 20M)**

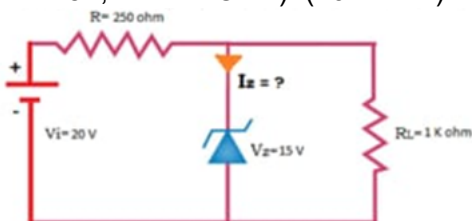
8. a(i) The diodes are connected in series to increase the forward conducting voltage. Determine the the output voltage  $V_{o1}$  &  $V_{o2}$  and current ( $I$ ) for the circuit shown in **figure (5 Marks)**



a(ii) A clamper circuit consist a capacitor and a diode to clamp the input signal and output is taken across the diode. Draw the output waveform for the circuit shown in figure. Given ( $V_i=10V$ ,  $V=3V$ , Assume Diode  $D$  is Ideal) (5 Marks)



(b) Zener diodes are widely used as voltage references and as shunt regulators to regulate the voltage across small circuits. In the given figure zener diode has breakdown volatage =15V, which is used in voltage regulator circuit. Find the current flowing through the zener diode.(Given  $R=250$  Ohm,  $V_i=20V$ ,  $V_z=15V$ ,  $R_L=1K$  Ohm) (10 Marks)



(CO1) [Application]