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**PRESIDENCY UNIVERSITY
BENGALURU**

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

Semester : Semester I - 2023

Course Code : ECE1006

Course Name : Sem I - ECE1006 - Basic Electronics Engineering

Program : B.TECH

Date : 09-DEC-2023

Time : 11:30 PM - 01:00 PM

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. Semiconductors are the materials whose conductivity lies between insulator and conductor. The two types of semiconductor materials are intrinsic and extrinsic semiconductors. Mention any two intrinsic and extrinsic semiconductor materials.
(CO1) [Knowledge]
2. Color coding is a technique to find out the value of the resistor. The equivalent value of resistance for color code Violet, Red Green and Silver is
(CO1) [Knowledge]
3. Germanium diode is having less break down voltage than Silicon diode. When a reverse bias is applied to a germanium PN junction diode, the reverse saturation current at room temperature is $0.3\mu\text{A}$. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature with $\eta=1$.
(CO1) [Knowledge]
4. Some circuits are used to smoothen the rectifier output. Name the component
(CO1) [Knowledge]
5. Zener diode under goes a break down, which provides a constant voltage connected under reverse bias condition. This break down is known as
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

6. A PN-junction diode is formed when a p-type semiconductor is fused to an n-type semiconductor creating a potential barrier voltage across the diode junction. Explain the working of two modes of PN junction diode. (10 Marks)
(CO1) [Comprehension]

7. A PN-junction diode is formed when a p-type semiconductor is fused to an n-type semiconductor creating a potential barrier voltage across the diode junction. Explain in detail the V-I characteristics of PN Junction diode. (10 Marks)

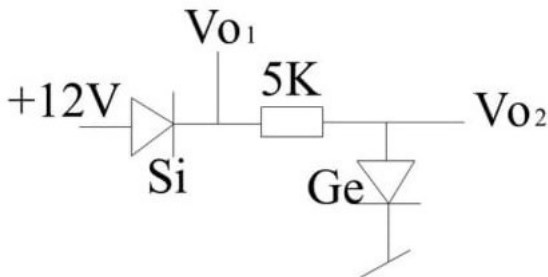
(CO1) [Comprehension]

PART C

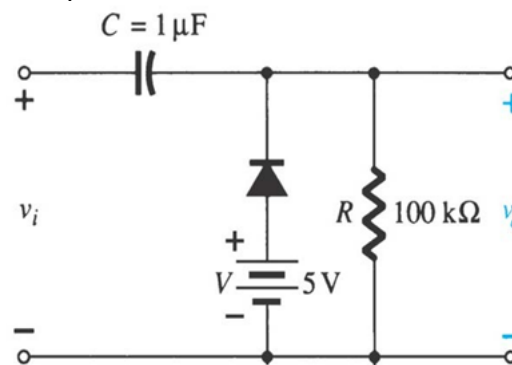
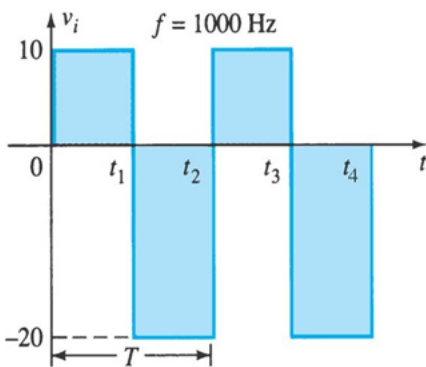
ANSWER THE FOLLOWING QUESTION

(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 **fig** (5Marks)



- a (ii) Electronic circuit which shift either positive or negative peak of the signal at a desired DC level is called a clamping or clamper circuit. Draw the output waveform for the circuit shown in figure. (5 Marks)



- (b) Zener diode is a bidirectional device used as voltage regulator. In the circuit shown the zener current (I_z) of zener diode is 10mA which is applied to maintain 5V across R_L . Find the minimum value of load resistance and the current across the load. (Given $R=100$ Ohms, $V_z=5V$, $I_z=10mA$, $V_i=10V$) (10 Marks)

