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**PRESIDENCY UNIVERSITY
BENGALURU**

SET B

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

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

Date : 9-DEC-2023
Time : 11:30 AM - 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. Three resistors R1,R2,R3 are connected in parallel across a DC voltage source with voltage across it as **V** volts. What is the total current **I** flowing in the circuit?
(CO1) [Knowledge]
- 2. A **P-N** junction diode has two modes of operation .The range of current flowing in Forward Bias mode is----- and in Reverse Bias mode is-----.
(CO1) [Knowledge]
- 3. The Knee voltage is the minimum voltage required for the diode to conduct.The Diode will conduct when the potential difference between the anode and the cathode exceeds the barrier voltagevolts for Ge andvolts for Si.
(CO1) [Knowledge]
- 4. Rectifier is the circuit which converts AC to DC .The Ripple factor of Half wave rectifier and Full wave Rectifier in terms of its ratio is ----- & -----respectively.
(CO2) [Knowledge]
- 5. Rectification is the process of converting AC to DC. The total number of diodes in full wave bridge rectifier is.....and total number of diodes in center tapped full wave rectifier.....
(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

6. The circuit of the full wave rectifier can be constructed in two ways. The first method uses a centre tapped transformer and two diodes. This arrangement is known as a centre tapped full wave rectifier. The second method uses a standard transformer with four diodes arranged as a bridge. Design a full wave rectifier using two diodes with N1 and N2 primary and secondary coil in transformer, also plot the graph of expected wave forms.

(CO2) [Comprehension]

7. (a) Diode is an electronic device that conduct electricity in one direction. The mode of operation and the required details is represented by the Diode Approximation models. Explain all three Diode Approximation models with the required circuits and graphs. **(5 marks)**

- (b) A PN junction diode is made by sandwiching one P-type and N-type of material . It works in two modes. With the relevant diagrams Explain the working of PN junction diode. **(5 marks)**

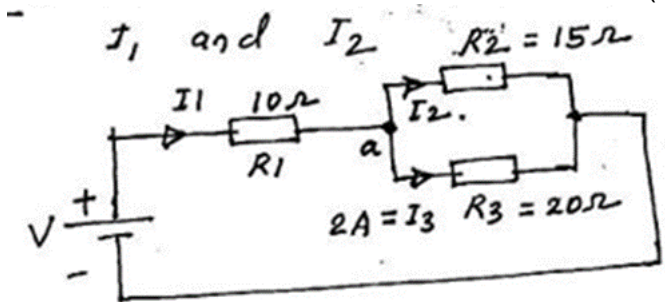
(CO1) [Comprehension]

PART C

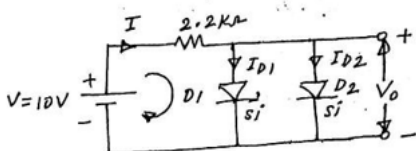
ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. a) When one end of all the resistances is connected to a common point and the other end of all the resistances is connected to another common point, so that there are as many number of paths for current flow as the resistances, then this is known as **parallel combination of resistances**. Estimate the total current I and I_2 if the the V value is $5v$ (7 marks).



- b) Mita is designing a semiconductor device-based circuit for her project help her to estimate the current through the diode D_1 and D_2 and total current I . consider both the diodes to be silicon(6 marks).



- c) Ram has a silicon diode working at a temperature of **40degree C**. If **0.7v** is the forward voltage applied across the diode with a reverse saturation current as **26nA**, calculate the forward current through the diode. consider **ideality factor as 2**.(7 marks).

(CO1) [Application]