United International University (UIU)
Dept. of Computer Science & Engineering (CSE)
**Mid-Term Exam: Trimester: Fall 2023**

**Course Code:** EEE 2123; **Course Title:** Electronics
**Total Marks:** 30; **Duration:** 1 hour 45 minute

**Any examinee found adopting unfair means would be expelled from the trimester/ program as per UIU disciplinary rules.**

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**Q1.** I/V characteristics of a diode operating at a fixed temperature is given below. [3+2+2]

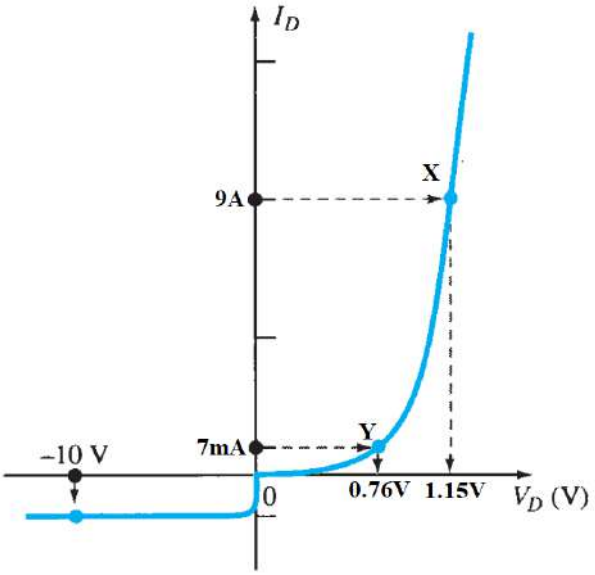


***Fig 1: Diagram for Q1***

Determine the followings:

(a) The operating temperature (for n = 2). [ Hint: Use $I_D = I_S\left(e^{\frac{V_D}{nV_T}}\right)$ ]

(b) Reverse saturation current at that temperature.

(c) Draw the approximate I/V curve for a different operating temperature of 50℃ with reference to the given I/V curve.

**Q2.** For the following circuit :

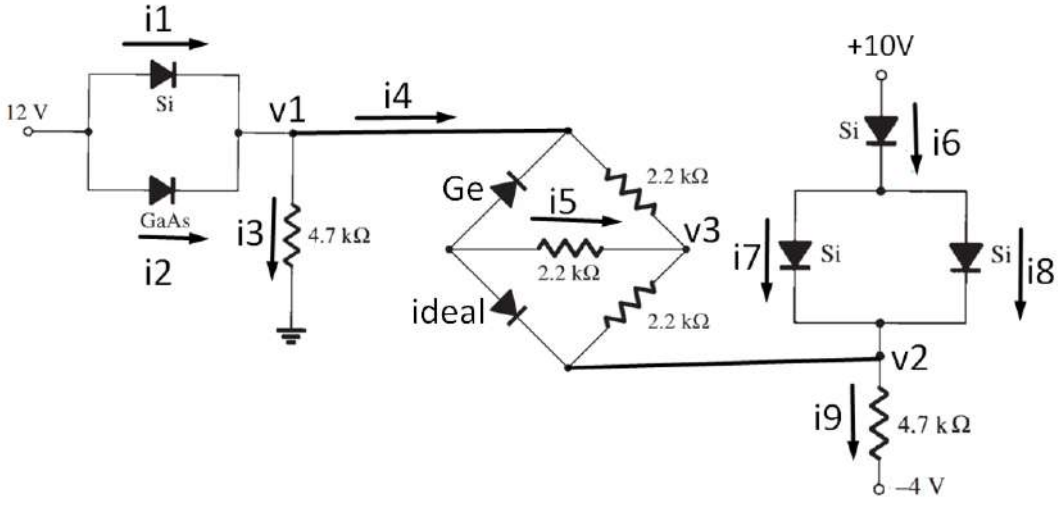


***Fig 2: Circuit diagram for Q2***

Draw the simplified diagram and hence find the values of $i_1$, $i_2$, $i_3$, $i_4$, $i_5$, $i_6$, $i_7$, $i_8$, $i_9$ and $v_1$, $v_2$, $v_3$. [8]

**Q3.**

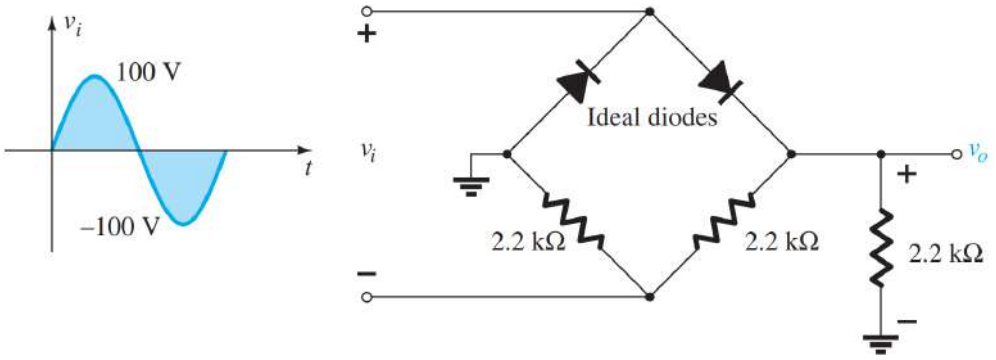


***Fig 3: Circuit diagram for Q3***

(a) Express $v_0$ in terms of $v_i$. [2]
(b) Find the maximum value and average value of $v_0$. [2]
(c) Sketch $v_0$ and $v_i$ in the same plot mentioning peak values. [2]
(d) Calculate PIV of any diode given in the above network. [1]

**Q4.** Sketch $\mathbf{i_R}$ and $\mathbf{v_o}$ for the network of following circuit for the input shown below: [4]

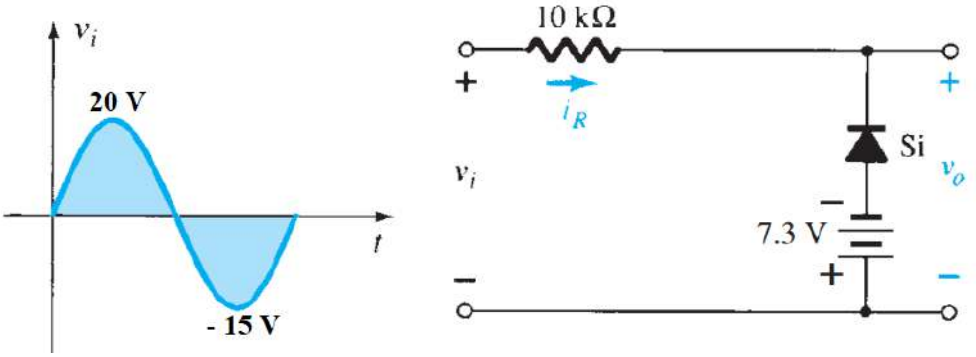


***Fig 4: Circuit diagram for Q4***

**Q5.** Design a clamper to perform the function indicated in following figure(Fig 5): [4]

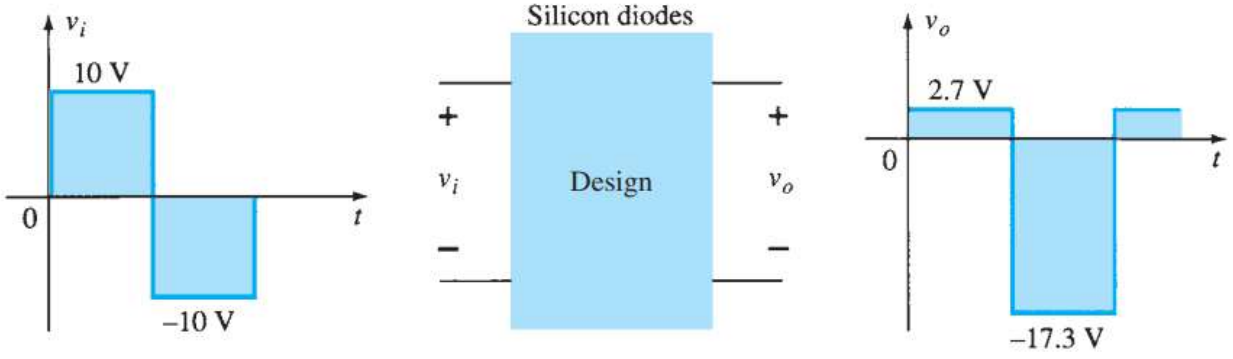


***Fig 5: Diagram for Q5***