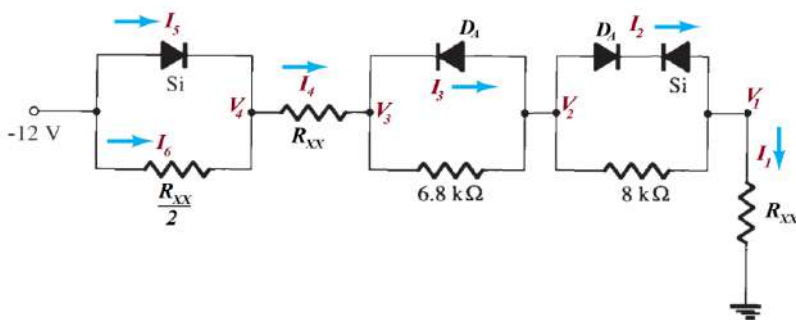


Any examinee found adopting unfair means would be expelled from the trimester/ program as per UIU disciplinary rules.

**Q1.** Let a 0.75 V battery be connected across a Silicon diode. Current through the diode is found to be 25 mA at 50° C. Consider,  $n = 1.x$ ; where  $x$  = last digit of your ID.

- Determine reverse saturation current at 50° C. [1]
- Draw the approximate I-V curves of the diode at 25, 50 and 75° C in a single graph. Clearly mention the temperatures in your graph. [2]
- Determine the diode currents at 25° C and 75° C. Sort the dc static resistances of the diode at above three temperatures in ascending order. [1.5+1.5]

**Q2.** Determine the values of  $I_1, I_2, I_3, I_4, I_5, I_6, V_1, V_2, V_3$  &  $V_4$  from the circuit of Fig. 1 [6]



$V_{ON}$ of $D_A$	Last digit of your ID $\times 0.3$ (V)
$R_{XX}$	Last digit of your ID (k $\Omega$ )

Fig 1: Circuit diagram for Q2

**Q3.** Consider the following circuit in Fig 4. Answer the following.

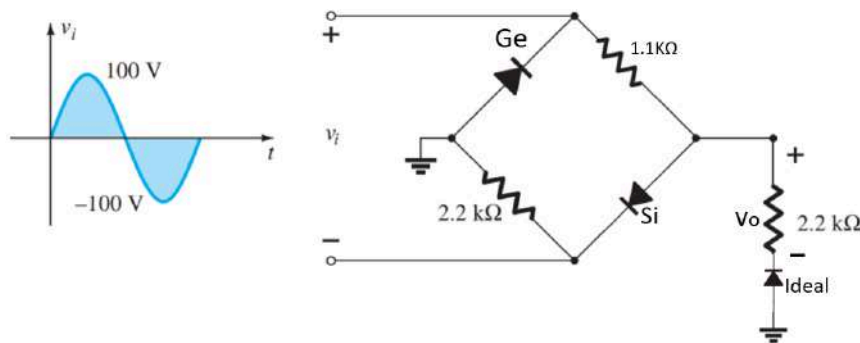


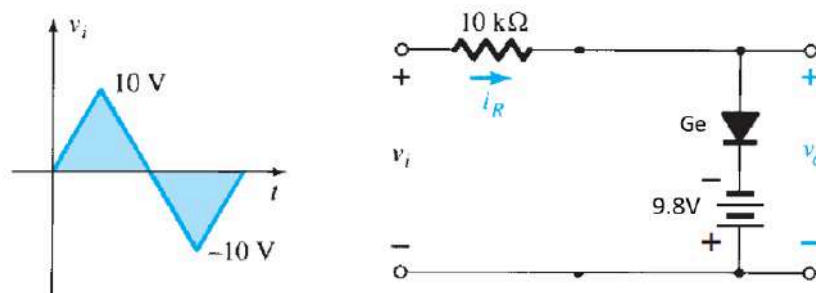
Fig 4: Circuit diagram for Q3

(P.T.O.)

a) Derive the output voltage expression and sketch proper labels and peak values in your graph. [4]

b) Calculate PIV of Si diode given in the above network. If the diodes can Withstand a maximum reverse voltage of 80V, then explain whether the circuit is safe or not. [2]

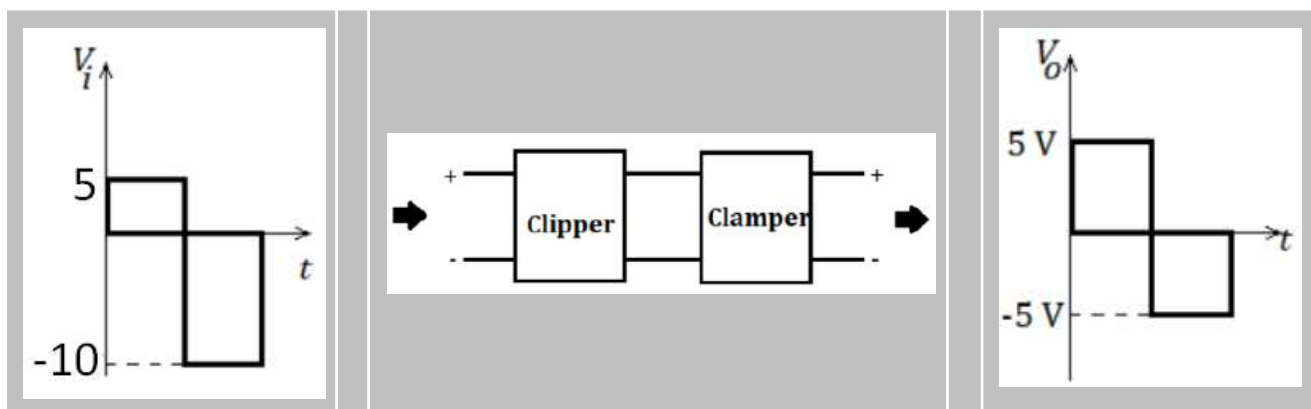
**Q4.** Analyze and sketch  $V_o$  and find  $i_r$  for the network of the following circuit for the input shown below. Clearly mention the peak values in your sketch. [3+3]



*Fig 5: Circuit diagram for Q4*

**Q5.** Design the clipper and clamper circuit to produce the following output voltage ( $V_o$ ) according to the given input voltage ( $V_i$ ). Assume the diodes in clipper circuit to be Si and Clamper circuit to be GaAs.

*Hints: Try to achieve a signal with 2V to -8V peak values at the end of the clipper network.* [3+3]



*Fig 6: Diagram for Q5*