



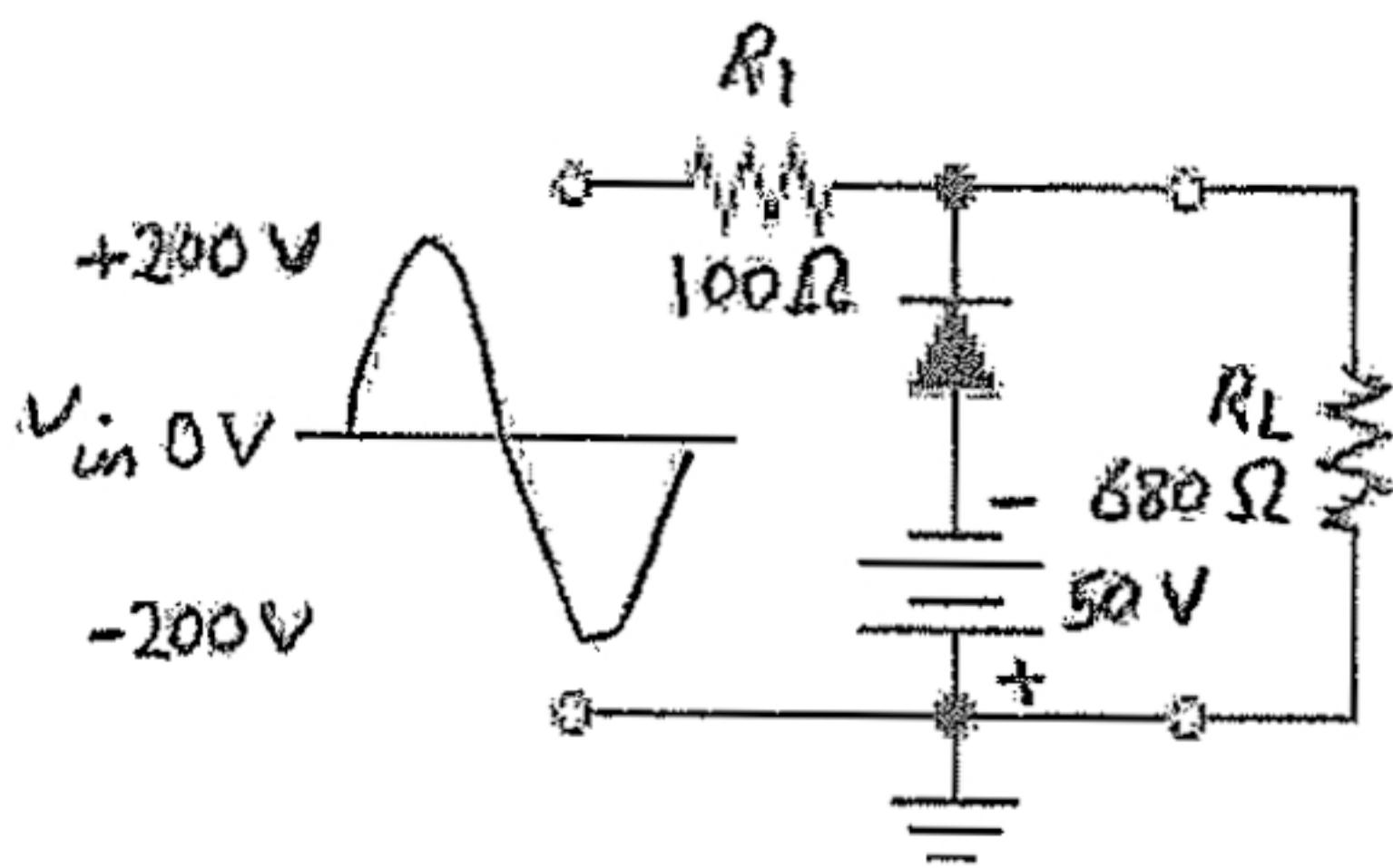
[1] Question One:

A) Explain each of the following:

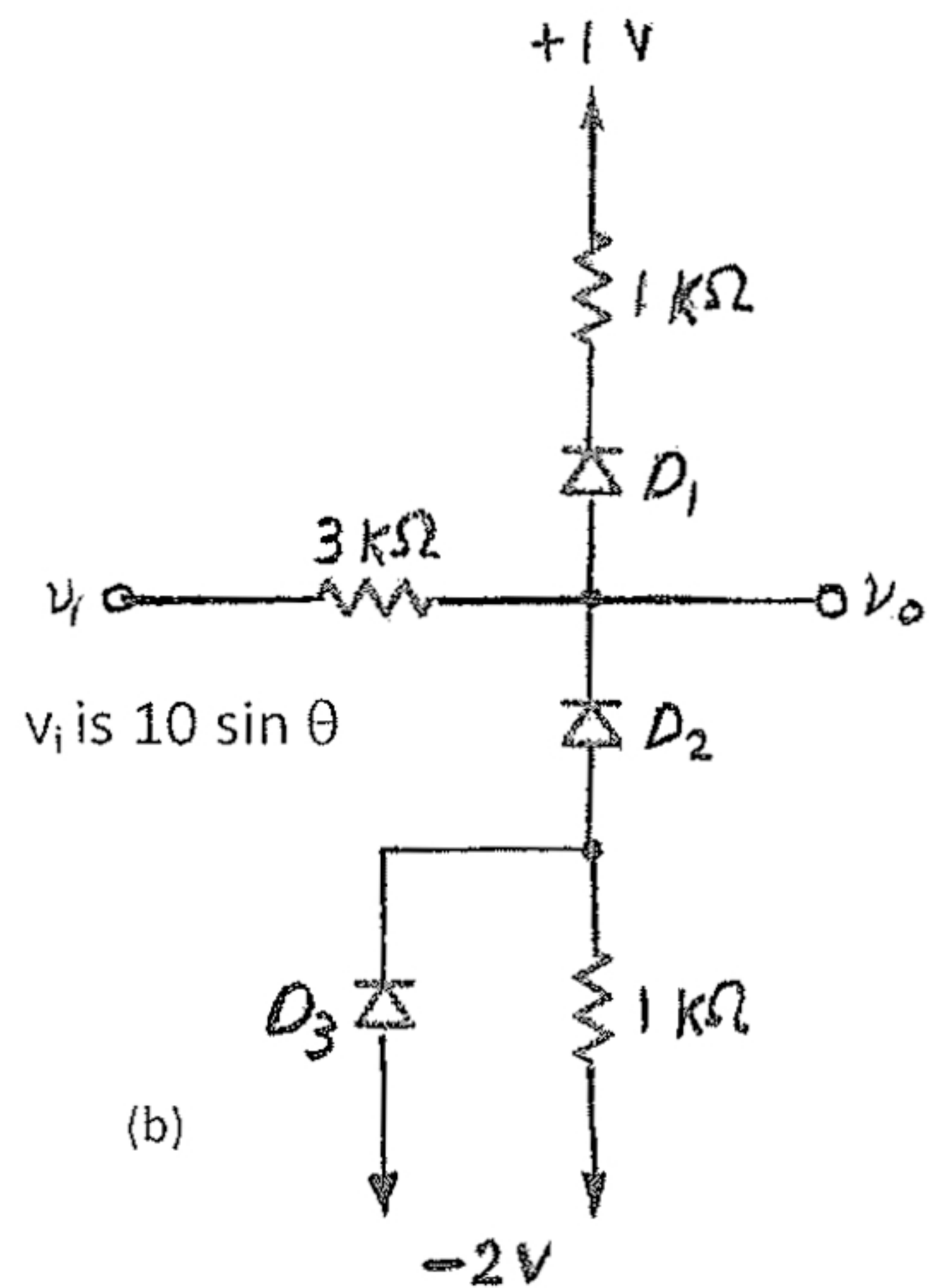
- a. Mobility of charged particle.
- b. Energy hill.
- c. saturation velocity.
- d. Static resistance and dynamic resistance of a diode.
- e. junction potential.

B) Derive expression for charges stored in the depletion region, then find the depletion region's width.

C) Determine v_o for each network of shown below for the input shown.



(a)



(b)

[2] Question Two:

- A) To obtain equal electron and hole drift currents. How should the carrier density to obtain? then define the other type of current?
- B) Explain conductivity of p type semiconductor .
- C) Draw the circuit of bridge rectifier and explain its operation with the help of input and output waveforms.
- D) Find the current flow in a silicon bar of $10 \mu\text{m}$ length having a $5 \mu\text{m} \times 4 \mu\text{m}$ cross-section and having free electron and hole densities of $10^{15}/\text{cm}^3$ and $10^{15}/\text{cm}^3$, respectively, with 1 V applied end-to-end. Use $\mu_n = 1200 \text{ cm}^2/\text{V-s}$ and $\mu_p = 500 \text{ cm}^2/\text{V-s}$.