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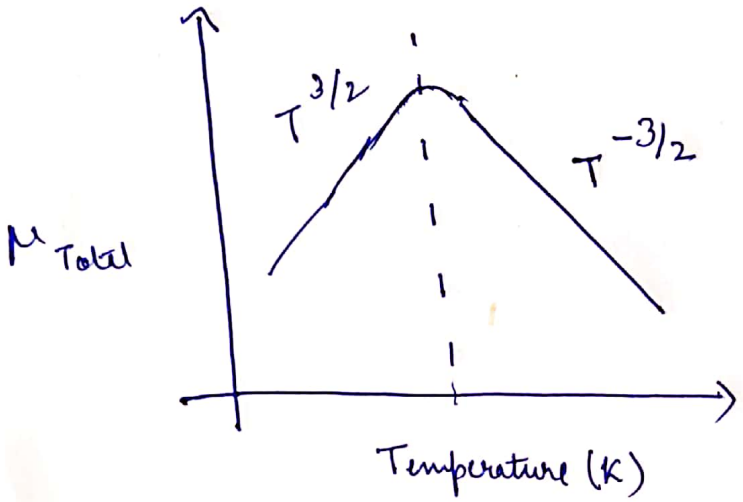
Q1) A) $\frac{1}{\mu_T} = \frac{1}{\mu_{IP}} + \frac{1}{\mu_P}$

When doping is low $\mu_{I.P.} >> \mu_P$

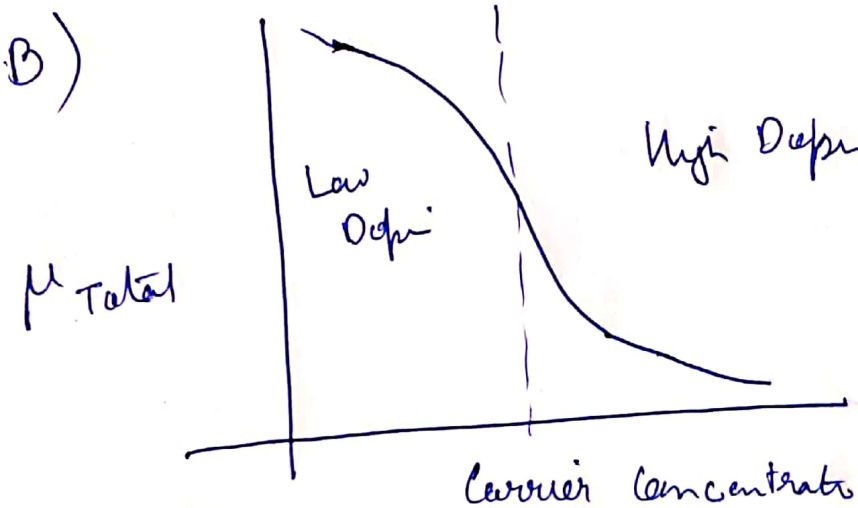
So $\frac{1}{\mu_T} \approx \frac{1}{\mu_P}$



When Temp is high $\mu_T \approx \mu_P$

When Temp is low $\mu_T \approx \mu_{IP}$

B)



Because at high doping there is a lot of collisions so μ_{Total} decreases, while

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at low ~~temp~~ doping, carrier concentration increases & but rate of collision is still low so doping increases

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Q6)

$$C = 8 \times 10 e^{-\lambda x}$$

$$2 = 8 \times 10 e^{-\lambda \times 0.5 mm}$$

$$\frac{1}{4} = 10 e^{-\lambda \times 0.5 \times 10^{-3}}$$

$$-\ln 4 = \lambda \times 0.5 \times 10^{-3}$$

$$\lambda = \frac{\ln 4}{0.5}$$

$$C = 8 \times 10 e^{-\frac{\ln 4}{0.5} x}$$

$$C = 8 \times 4^{-2x}$$

where x is in mm