University of New Mexico

ECE321-Electronics I (Fall 2012)

Homework Solution # 4

$$I = \frac{5 - (-5)}{10k} = ImA$$

$$V = -5$$

27.2
$$I = \frac{5 - (-5)}{10k} = ImA$$

(a) $I = \frac{5 - (-5)}{10k} = ImA$

(b) $I = 0$

(c) $V = 5$

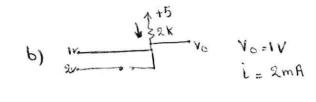
(d) $V = 5$

C)
$$V=5V$$
 $i=ImA$

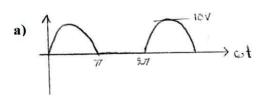
d)
$$I \downarrow \int_{-5}^{+5} I = 0$$

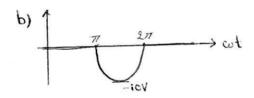
$$V_0 = -5V$$

a) $\frac{1}{2v}$ $\frac{1}{1}$ $\frac{1}{2}$ $\frac{1}{2}$

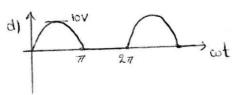


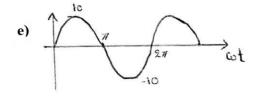
V5=Vp Sin cot

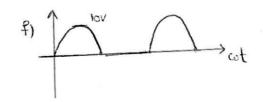


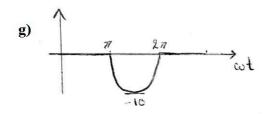


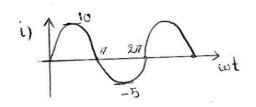












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Department of Electrical and Computer Engineering

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Homework Solution # +

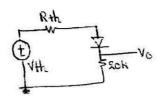
4.10

a) Rth =
$$\hat{x}$$
ck | 10k = 6.67 kQ
Vth = $6v \times \frac{80k}{30k} = 4v$

Ve = $(\frac{20k}{20k+R_{Th}})^2 + 3v$

Vth = $6v \times \frac{80k}{30k} = 4v$

Vth = $\frac{2}{5}v$
 $\frac{2}{5}v$
 $\frac{2}{5}v$
 $\frac{2}{5}v$
 $\frac{2}{5}v$
 $\frac{2}{5}v$



$$V_{c} = \left(\frac{2ck}{2ck+R\tau k}\right)^{2} + \frac{3V}{2ck+R\tau k}$$

$$I = \frac{2V}{2ck+R\tau k} = 15c\mu A$$

I =0

1 =0

2.5 The voitage across the diade is -0.5 v

V=+3V \longrightarrow De is off and Di is on \longrightarrow Red lamp is on. V=0 V _____ D18 D2 are Off _____ Neither is on. V=-3V \longrightarrow Do is on and D₁ is off \longrightarrow Sizen lamp is on.

4.17 $V_{T} = \frac{kT}{q}$ $T = 40^{\circ}C \rightarrow V_{T} = 22.11 \text{mV}$ $T = 40^{\circ}C \rightarrow V_{T} = 24.01 \text{mV}$ $K = 1.58 \times 10^{-13}C$ $T = 0^{\circ}C \rightarrow V_{T} = 23.56 \text{mV}$ $T = 150^{\circ}C \rightarrow V_{T} = 230 \text{ k} = 17^{\circ}C$ $V_{T} = 25 \text{mV}$ $V_{T} = \frac{kT}{q} \rightarrow T = \frac{V_{T}q}{k} \rightarrow T = 230 \text{ k} = 17^{\circ}C$

4.18 In= Is(e NO/VT-1) $10=1_5(e^{V_0/V_1})$ $\longrightarrow V_0=0.179V$ $I_0=I_3(e^{0.7/0.025})=(492.7\times10^{-19})I_5$ VT = 0.025

@ room temperature Vo=0.7v 4.19

$$I_{5} = \frac{I_{D}}{(e^{VOIVT} - 1)} = \frac{I_{MA}}{(e^{c\cdot7/c.c259} - 1)} = \frac{1.83 \times 10^{-15} \text{ A}}{(e^{c\cdot7/c.c259} - 1)}$$

$$V_{0} = c.5 \text{ V} \longrightarrow I_{D} = (1.83 \times 10^{-15}) (e^{c\cdot5/o.c259} - 1) \longrightarrow I_{D} = 2143.11 \text{ pA}$$