Name Muhammad Ali

Reg.no 19pwcse1801

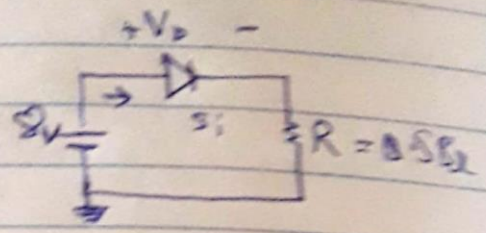
Section A

Day: M T W T F S

Date: ___/___/___

Question No 1

Solution:-



$E = 8V$

$R = 0.58k\Omega$

We know that Si diode on $V = 0.7V$, so

$$\boxed{V_d = 0.7V}$$

$$V_R = E - V_o$$

$$V_R = 8 - 0.7$$

$$\boxed{V_R = 7.3\ V}$$

$$I_D = \frac{V_R}{R}$$

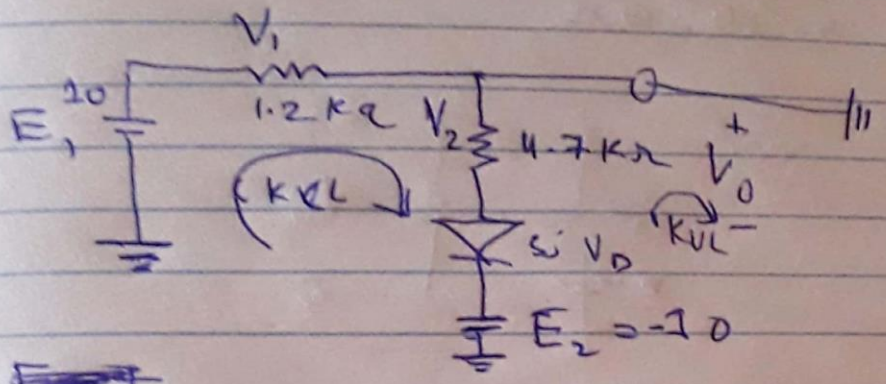
$$I_D = \frac{7.3}{0.58K\Omega}$$

$$I_D = 12.5mA$$

Question No 2

$E_1 = 10$

$E_2 = -10$



$$E_1 + E_2 - V_D = I(R_1 + R_2)$$

$$I_d = \frac{10 - 10 - 0.7}{(1.2K) + (4.7K\Omega}$$

$$I_d = \frac{-0.7}{5.9 \times 10^3}$$

$$\boxed{I_d = 0.11\ mA}$$

To find "V_o"

Applying KVL on second loop

$$-E_2 + V_D + V_2 - V_o = 0$$

$$V_o = -(-10) + (0.7) + I R_2$$

$$V_o = 9.3 + (0.11 \times 10^{-3})(4.7K\Omega)$$

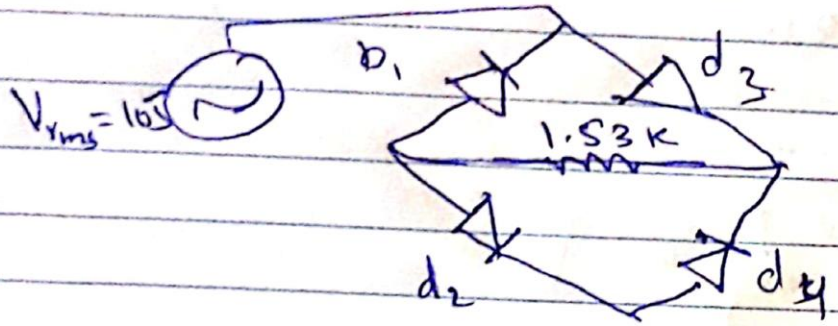
$$\boxed{V_o = 4.80V}$$

Date: / /

Question No 3

$V_1 = 105\ V$

$R = 1.53K\Omega$



first convert rms values to peak - to peak

$$V_{rms} = \frac{V_m}{\sqrt{2}}$$

$$V_m = (105)(\sqrt{2})$$

$$\boxed{V_m = 148.4\ V}$$

Si diod has $V_d = 0.7\ V$

So for full half cycles two Si diod have values

$$V = 0.7 + 0.7$$

$$V = 1.4\ V$$

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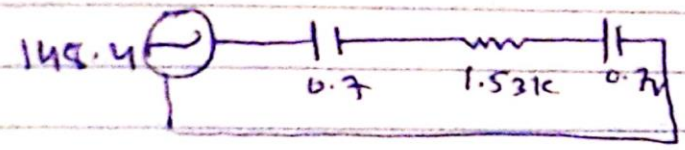
(a) By KVL equation, we get

$$V_{dc} = \frac{2V_m - 2V}{\pi}$$

$$V_{dc} = \frac{2(148.4) - 2(1.4)}{\pi}$$

$$\boxed{V_{dc} = 93.6\ V}$$

(b)



$$PIV = V_m - V_d = 148.4 - 0.7$$

$$\boxed{PIV = 147.7}$$

PIV is for both diode

(c) Find maximum current I_m

Applying KVL on above circuit

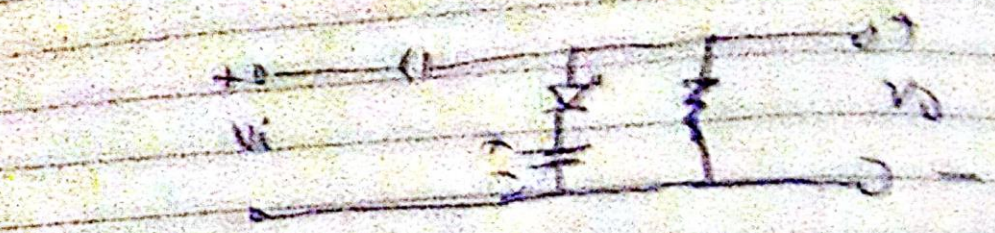
$$V_m - V - I_{dmax} R_L = 0$$

$$I_{d(max)} = \frac{V_m - V}{R_L}$$

$$I_{d(max)} = \frac{(148.4 - 1.4)}{(1.53K\ \Omega)}$$

$$\boxed{I_{d(max)} = 96\ mA}$$

Question No 1



$V_m = 187$ V

$E = 16$ V

(+) half cycle

$V_m - E - 0.7 - V_{cap} = 0$

$V_{cap} = 187 - 16 - 0.7$

$\boxed{V_{Cap} = 170.3}$

So

$V_{m+} = 16 + 0.7$

$\boxed{V_{m+} = 16.7\ V}$

For (-) half cycle

$V_{cap} = V_m - V_c$

$= 187 - 170.3$

$\boxed{V_{cap} = 16.7}$

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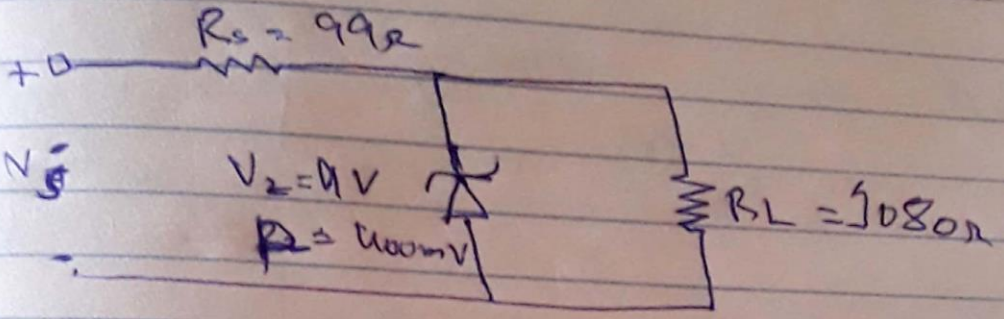
Question No 5

Solution :-

$R_s = 99\Omega$

$V_z = 9V$

$R_L = 1080\Omega$



To find the value of V_o we use voltage divider rule

$$R_L = \frac{R_s V_z}{V_i - V_z}$$

$$I_z = \frac{P}{V_z} = \frac{100mW}{9V}$$

$$I_z = 4.35mA$$

$$V_i R_L - V_z R_L = R_s V_z$$

$$V_i = \frac{R_s V_z + V_z R_L}{R_L}$$

$$V_i = \frac{(99)(9) + (9)(1080\Omega)}{1080\Omega}$$

$$V_i = \frac{10611}{1080\Omega}$$

$$\boxed{V_i = 9.8V}$$

$V_{RL} = V_j - V_z$

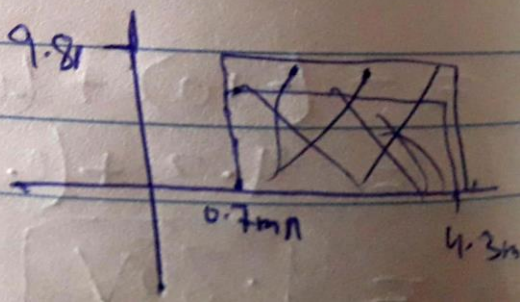
$= 9.8 - 9$

$\boxed{V_{RL} = 0.8V}$

$I_{R_L} = \frac{0.8V}{1080} = 0.7mA$

$V_{min} = 0.8V$

$V_{max} = 9.8V$



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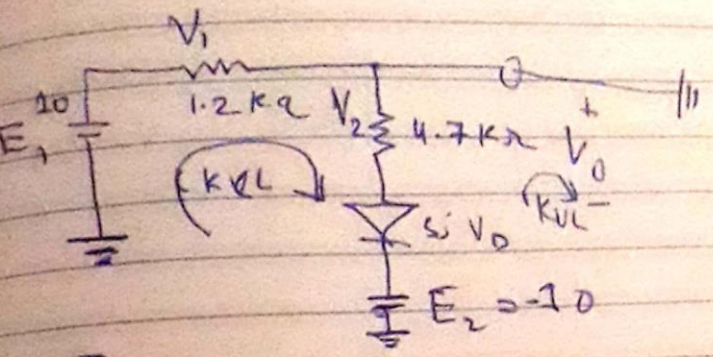
$E_2 = -10$



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To find "V_o"

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$$-E_2 + V_D + V_2 - V_o = 0$$

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$$V_o = 9.3 + (0.11 \times 10^{-3})(4.7K\Omega)$$

$$\boxed{V_o = 4.80V}$$