Green University of Bangladesh

Department of Computer Science and Engineering

Mid Assignment

Course Title: Electronic Devices and Pulse Techniques

Course code: EEE-203

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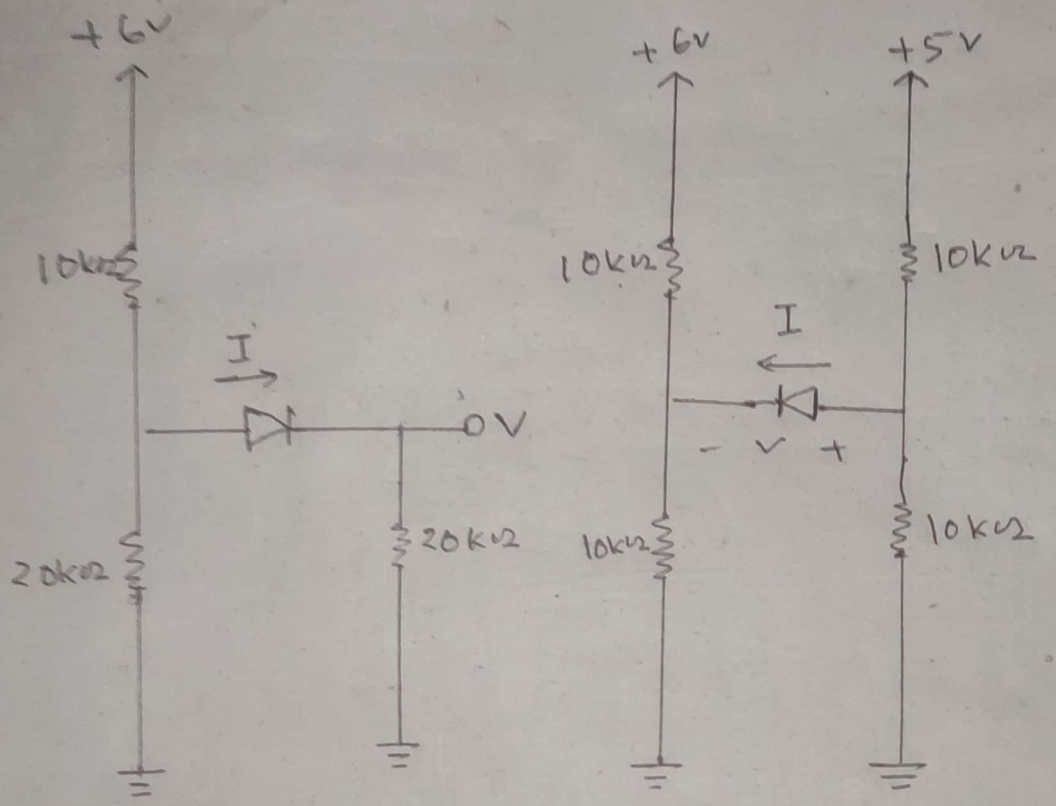
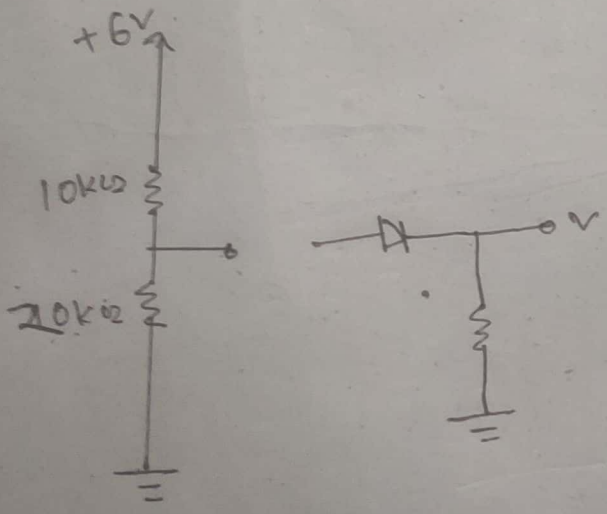
Ans to the Q.no: 1



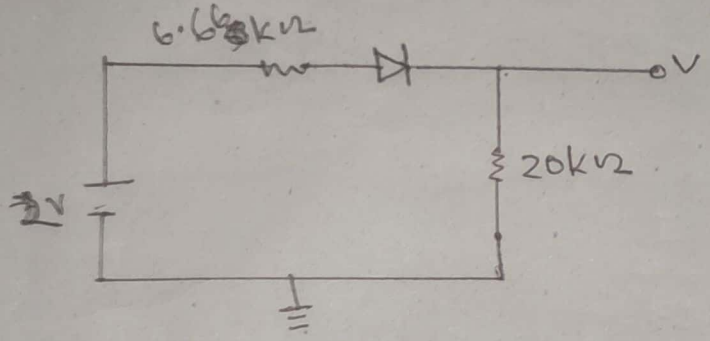
draw circuit diagram. Fig(a)



$$V_{th} = \frac{6}{10+20} \times 10 = 2V$$

R_{th} = ~~10kΩ~~ 20kΩ || 10kΩ = ~~5kΩ~~ 6.66kΩ

now,



the Diode is in forword Bias.

$$V = \frac{20}{20+5} \times 2$$

$$= 1.60V$$

$$I = \frac{2}{6.66 + 20}$$

$$= 0.75\ mA$$

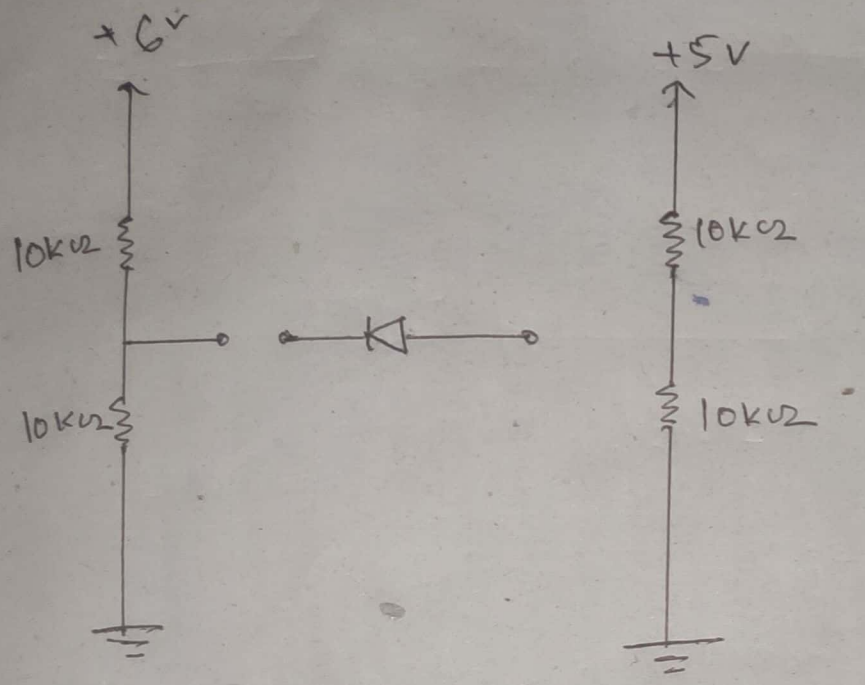
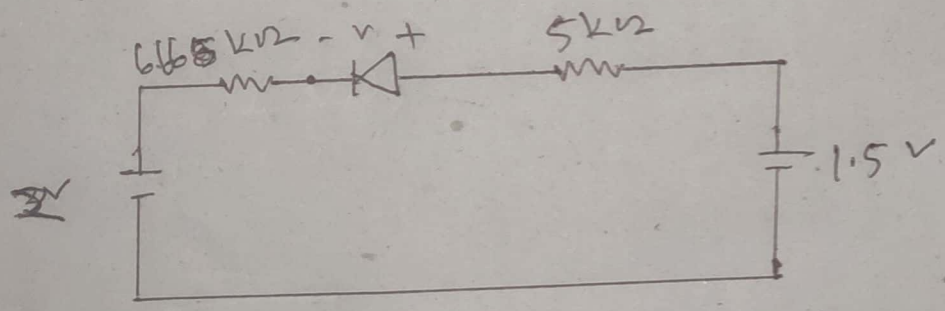


Fig:(b)

Now,



this Diode Reverse Bias because Anode voltage < Cathode voltage.

$I = 0A$

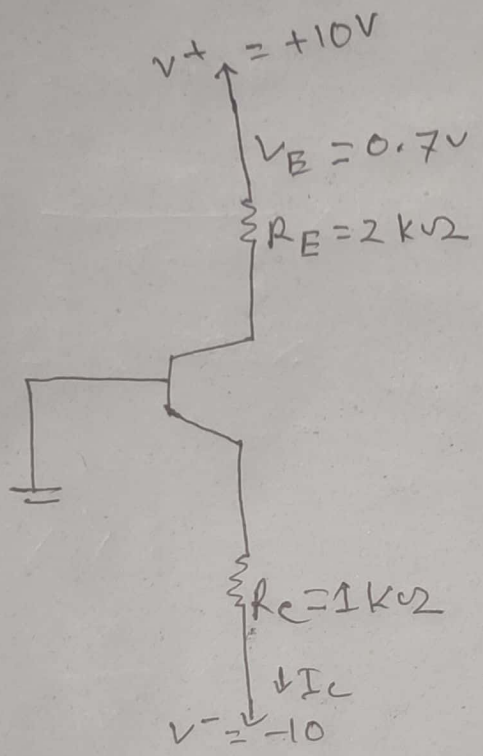
$V = 1.5 - 2 = -0.5V$

Result: ~~forword~~ Bias, $I = \frac{0.375}{0.75}A$, $V = \frac{1.50V}{2.4V}$

Reverse Bias, $I = 0A$, $V = -0.5V$ Ans.

Ans to the Q.NO:2

Given that,



It's a Pnp transistore is grounded. the emitter is connected to a positive supply $V^+ = +10V$ through R_E. the emitter base junction will be forward biased.

$$V_E = V_{EB} \simeq 0.7V$$

now, emitter current,

$$I_E = \frac{V^+ - V_E}{R_E} = \frac{10 - 0.7}{2}$$

$$= 4.65\,mA$$

Given that,

$V^+ = 10$

$V_E = 0.7$

$R_E = 2$

$I_E = ?$

We know,

$$I_c = \alpha I_E$$

$$= 0.99 \times 4.65 \text{ mA}$$

$$= 4.6 \text{ mA}$$

Here,

$\alpha = 0.99$

$I_E = 4.65 \text{ mA}$

The collector voltage will be,

$$V_c = V^- + I_c R_c$$

$$= -10 + 4.6 \times 1$$

$$= -5.4 \text{ V}$$

Here,

$V^- = -10 \text{ V}$

$I_c = 4.6 \text{ mA}$

$R_c = 1$

$V_c = ?$

and,
the Base current will be,

$$I_B = \frac{I_E}{\beta + 1}$$

$$= \frac{4.65}{100 + 1}$$

$$= 0.05 \text{ mA}$$

Here,

$I_E = 4.65 \text{ mA}$

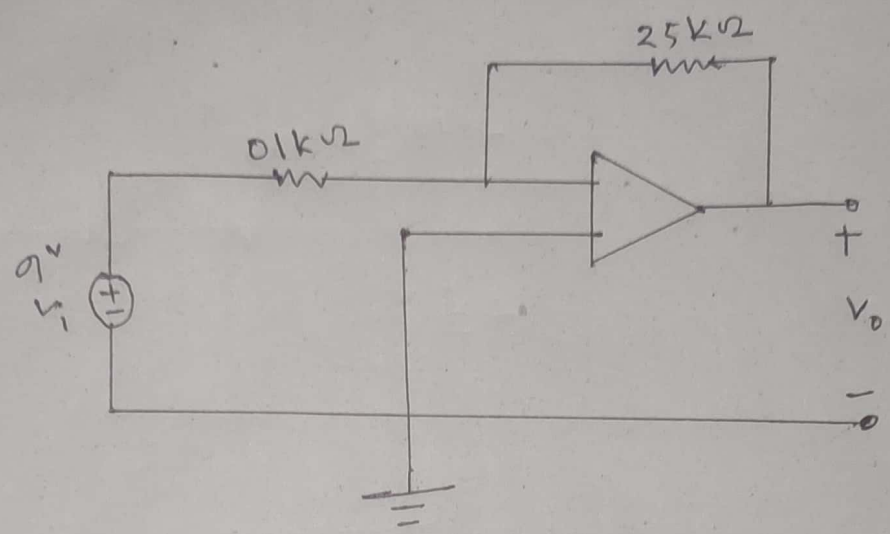
$\beta = 100$

$I_B = ?$

Result : voltage -5.4 V and current 0.05 mA

Ans.

Ans to the Q.NO: 3



This is inverting conection.

we know,

$$V_o = -\frac{R_f}{R_i} \times V_i$$

$$= -\frac{25}{1} \times 9$$

$$= -225\ V$$

Here,

Feedback Resistor, $R_f = 25k\Omega$

input Resistor, $R_i = 01k\Omega$

input voltage, $v_i = 9v$

output voltage, $v_o = ?$

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∴ Output voltage is, $v_o = -225\ v$

Ans.