Green University of Bangladesh

Department of Computer Science and Engineering

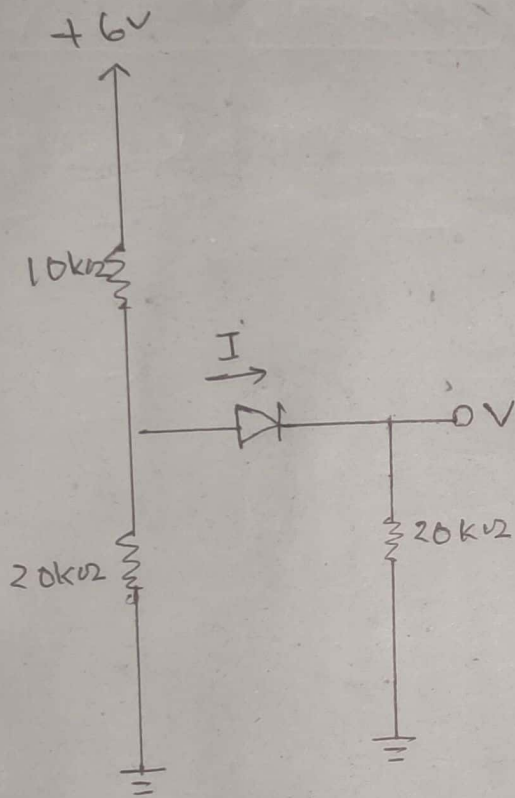## Mid Assignment

Course Title: Electronic Devices and Pulse Techniques
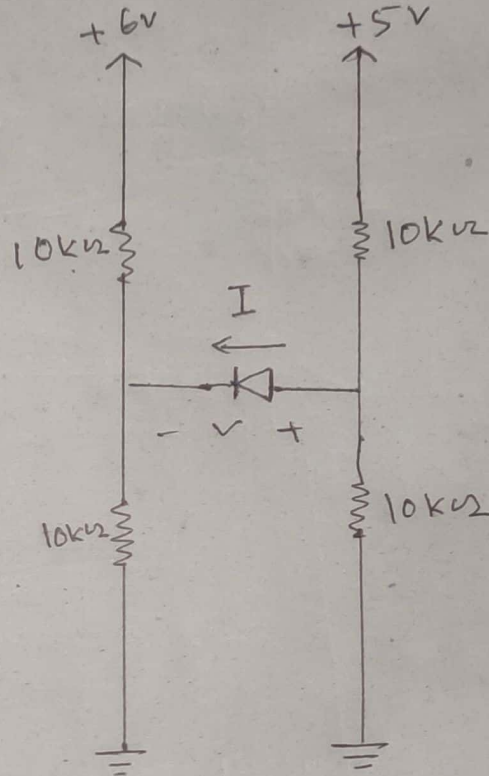
Course code: EEE-203

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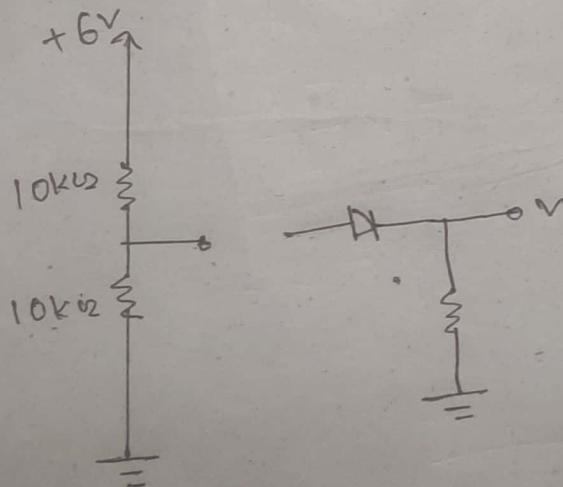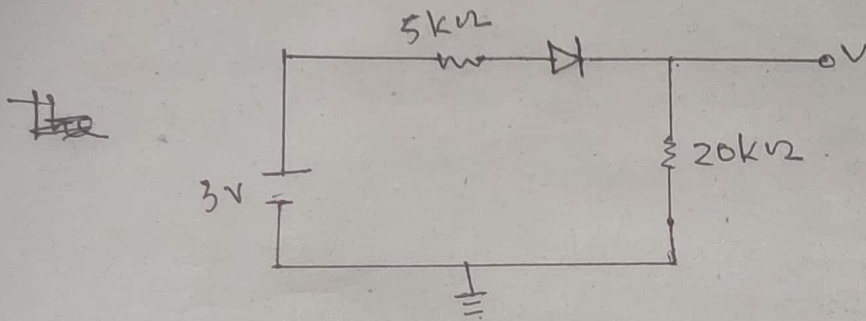| Submitted to:	Submitted by :
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Green university of Bangladesh	Department : CSE
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(a)

(b)

draw circuit diagram. Fig(a)

$$V_{th} = \frac{6}{10+10} \times 10 = 3V$$

$R_{th} = \cancel{10k} \parallel 10k\Omega = 10k\Omega \parallel 10k\Omega = 5k\Omega$

now,

the Diode is in forward Bias.

$$V = \frac{20}{20+5} \times 3$$
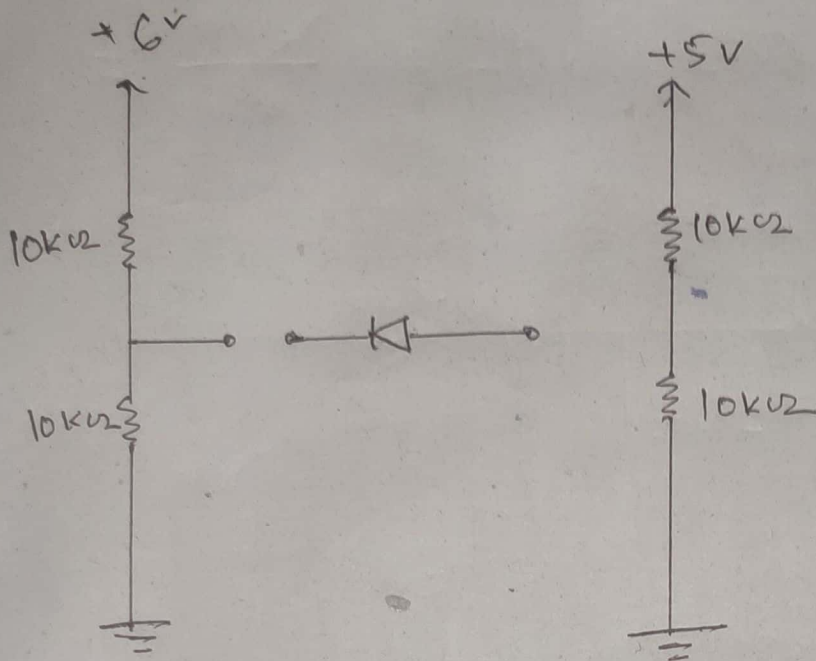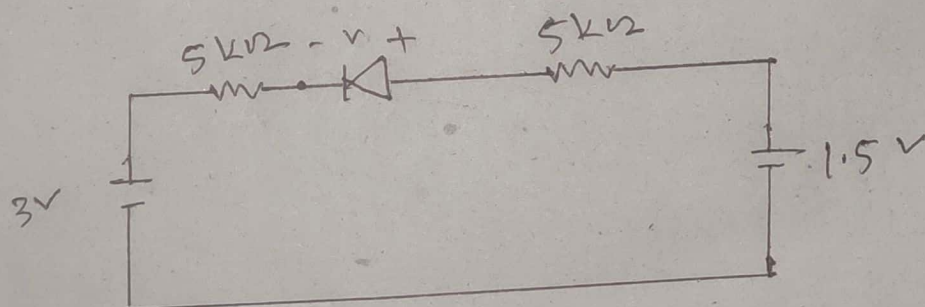
$$= 2.4 \, V$$

$$I = \frac{3}{5+20}$$

$$= 0.12 \, A$$

+6v

10kΩ

10kΩ

Fig:(b)

+5v

10kΩ

10kΩ

∴ now,

5kΩ - v +   5kΩ

3v   1·5 v

this Diode Reverse Bias because Anode voltage <

Cathode voltage.

$I = 0 A$

$v = 1.5 - 3 = -1.5 v$

Result : forward Bias, $I = 0.12 A$, $v = 2.4 v$

Reverse Bias, $I = 0 A$, $v = -1.5 v$ Ans.

Ans to the Q.NO:2

Given that,

$$v^+ = +10V$$

$$V_E = 0.7v$$

$$R_E = 2k\Omega$$

$$R_c = 1k\Omega$$

$$\downarrow I_c$$

$$v^- = -10$$
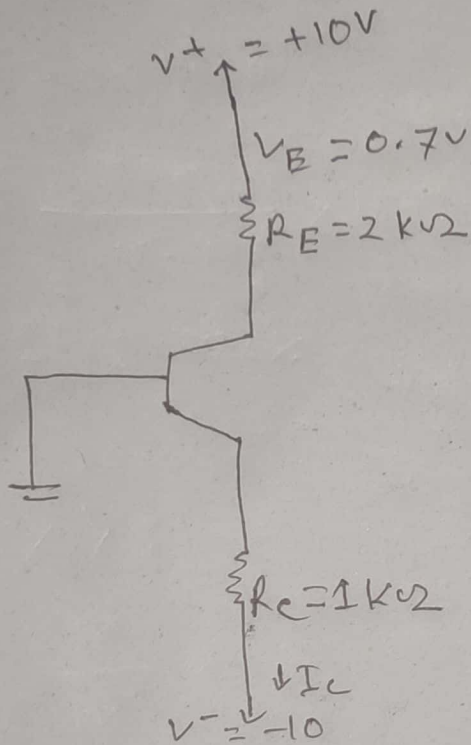
It's a pnp transistor is grounded. The emitter is connected to a positive supply $v^+ = +10v$ through R_E. The emitter base junction will be forward biased.

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

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,

$$I_c = \alpha I_E$$

$$= 0.99 \times 4.65 \, mA$$

$$= 4.6 \, mA$$

Here,

$$\alpha = 0.99$$

$$I_E = 4.65 \, mA$$

The collector voltage will be,

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

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

$$= -5.4 \, v$$

Here,

$$V^- = -10 \, v$$

$$I_c = 4.6 \, mA$$

$$R_c = 1$$

$$V_c = ?$$

and,
the Base current will be,

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

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

$$= 0.05 \, mA$$

Here,

$$I_E = 4.65 \, mA$$

$$\beta = 100$$

$$I_B = ?$$

Result: voltage $-5.4 \, v$ and current $0.05 \, mA$

Ans.

Ans to the Q.NO: 3
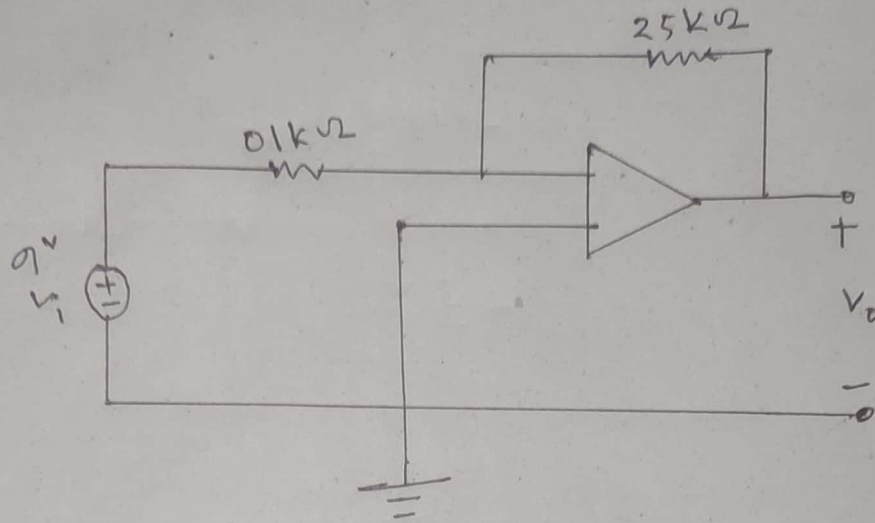
This is inverting conection.

we know,

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

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

$$= -225 \text{ V}$$

Here,

Feedback Resistor, $R_f = 25 k\Omega$

input Resistor, $R_i = 01 k\Omega$

input voltage, $V_i = 9v$

output voltage, $V_o = ?$

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∴ Output voltage is, $V_o = -225 \text{ V}$

Ans.