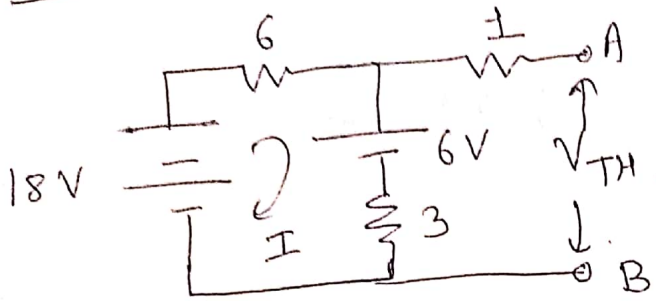
Q.2 A.

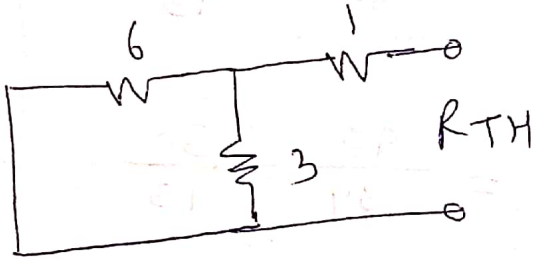


$$6I + 6 + 3I - 18 = 0$$

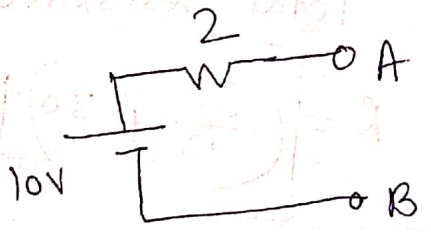
$$9I - 12 = 0$$

$$I = \frac{12}{9} = \frac{4}{3} A$$

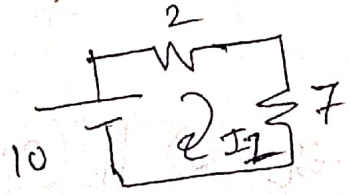
$$V_{TH} = 6 + 3I = 6 + 3 \cdot \frac{4}{3} = 10 V.$$ — (2) marks



$$R_{TH} = (6 \| 3) + 1 = \frac{18}{9} + 1 = 2\,\Omega$$ — (1) mark



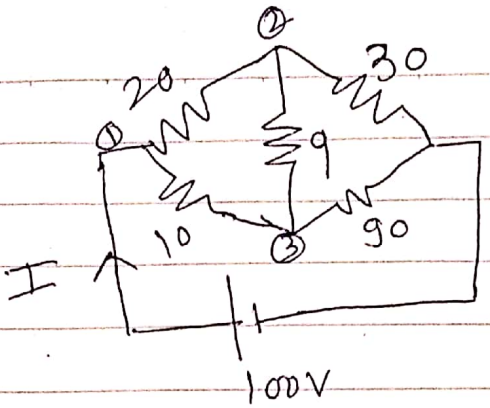
Thevenin's equivalent ckt — (1) mark



$$I_7 = \frac{10}{2+7} = \frac{10}{9} A$$ — (1) mark

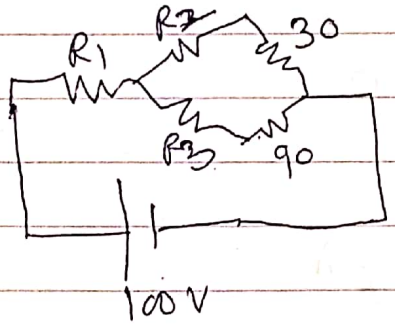
Page No.
Date : / /201

Q.2 B)



Find I

- Δ to Y conversion by ① ② & ③ pts.



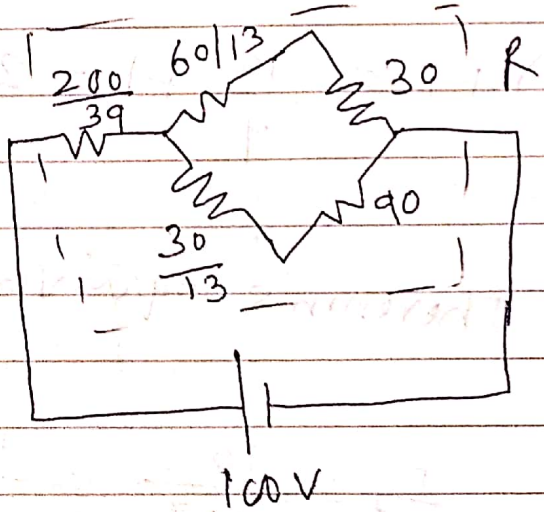
$$R_1 = \frac{20 \times 10}{20+10+9}$$

$$R_1 = \frac{200}{39}$$

$$R_2 = \frac{20 \times 9}{39} = \frac{180}{39} = \frac{60}{13}$$

$$R_3 = \frac{10 \times 9}{39} = \frac{90}{39} = \frac{30}{13}$$

(2) marks.



Total resistance R

$$R = \left[\left(\frac{60}{13} + 30\right) \| \left(\frac{30}{13} + 90\right)\right] + \frac{200}{39}$$

$$R = \left[(4.62 + 30) \| (2.31 + 90)\right] + \frac{200}{39}$$

Teacher's Signature.....

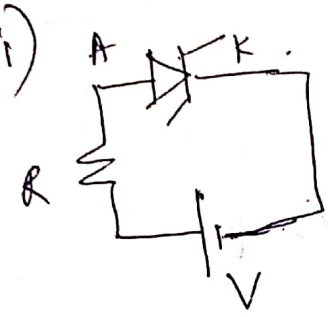
$$R = (34.62 \parallel 92.31) + 5.13$$

$$R = 25.17 + 5.13 = 30.31 \quad \text{— (2) marks}$$

$$I = \frac{100}{30.31} = 3.299\ A \quad \text{— (1) mark.}$$

Q.3 i)

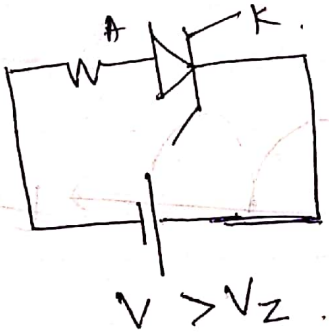
A)



i) Forward biased.

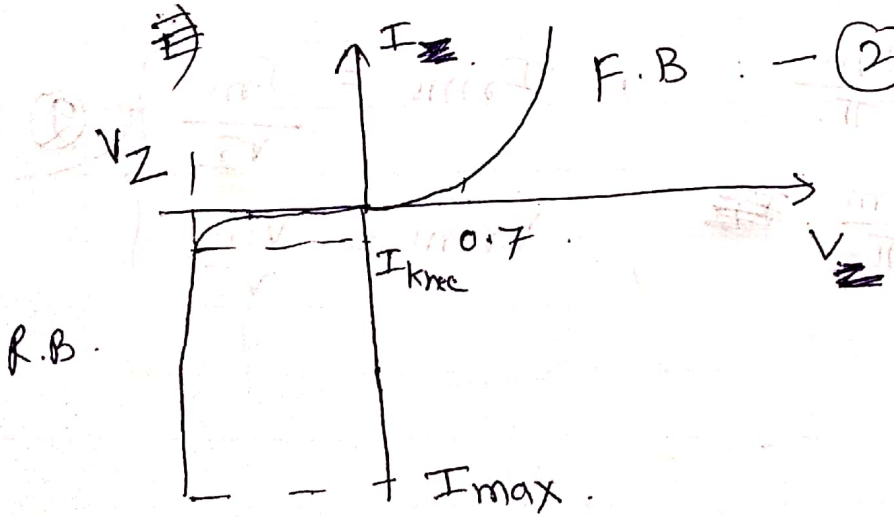
— (2) marks.

ii)



ii) Reverse biased.

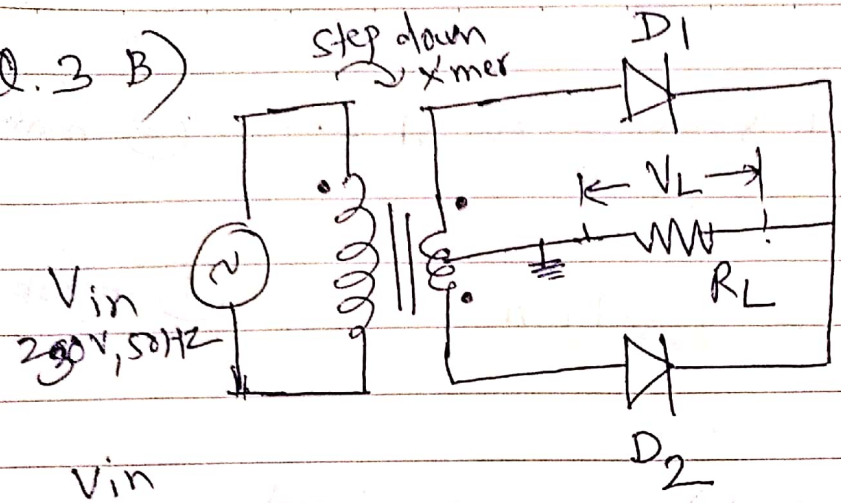
— (2) marks.



F.B : — (2) marks.

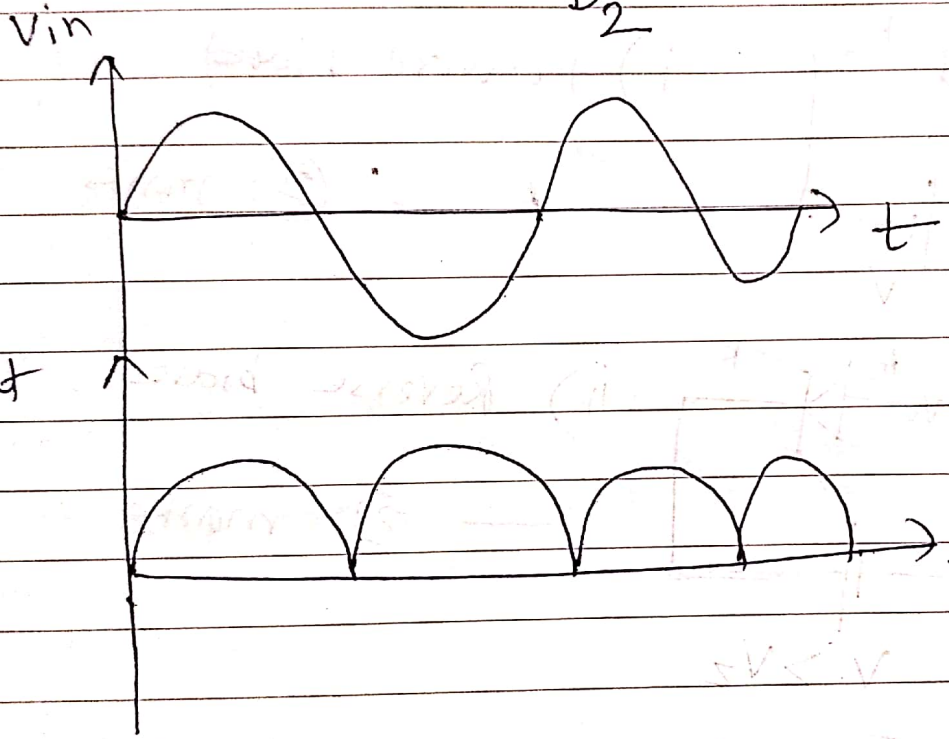
Page No.
Date : / /201

(Q.3 B)



2 marks

1½ marks



1 mark

½ mark

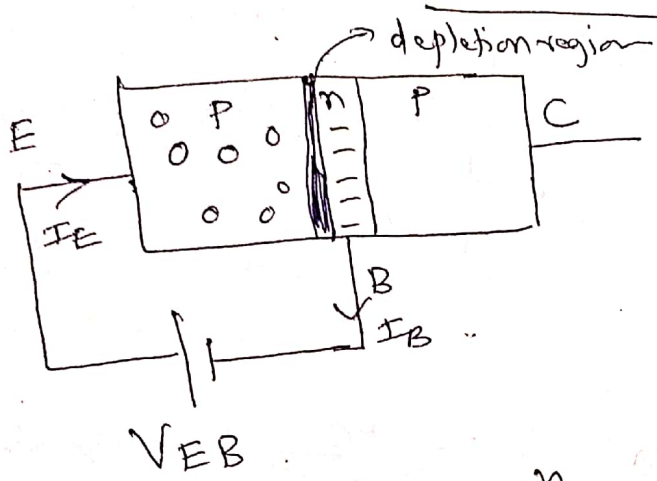
$I_{dc} = \frac{2I_m}{\pi}$, $I_{rms} = \frac{I_m}{\sqrt{2}}$

$V_{dc} = \frac{2V_m}{\pi}$, $V_{rms} = \frac{V_m}{\sqrt{2}}$

2 mark

OR

Q.3. CB — construction dia.



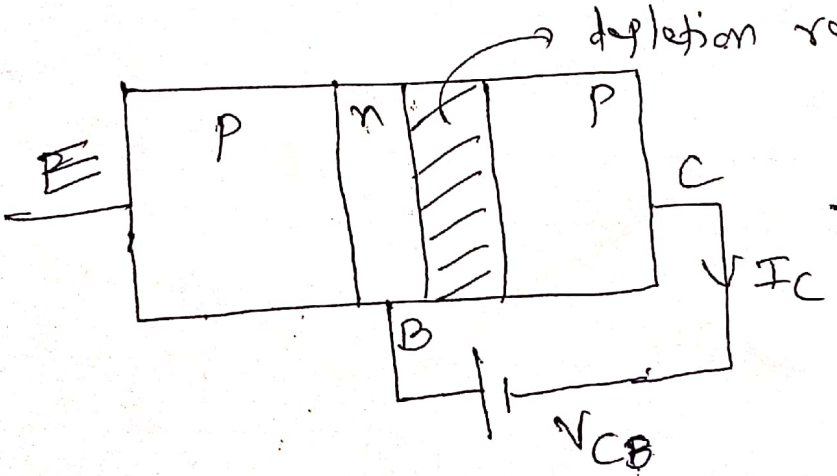
→ (2) marks.

- Forward biased E-B j^n.
- Width of depletion region reduces resulting in heavy flow of majority carrier current from p to n.

(2) marks.

p — holes are majority carriers.

n — electrons are majority carriers.



(2) marks.

- Reverse biased B-C j^n.
- Width of depletion region increases

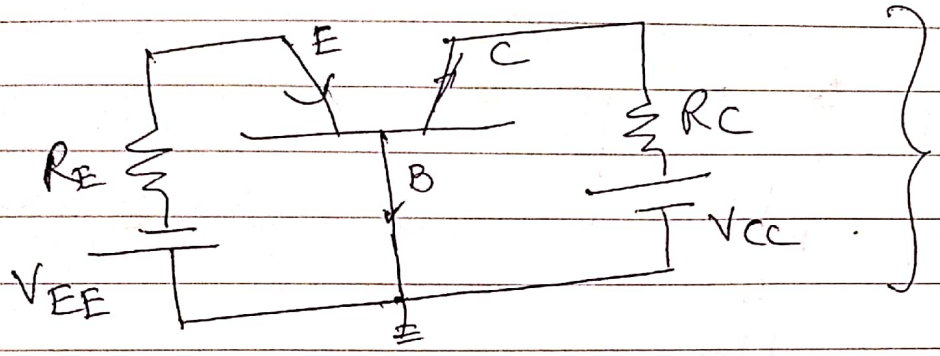
(2) marks

(OR)

Page No.
Date : / /201

OR.

CB - configuration dia.



(4) marks.

current gain, $\alpha = \frac{I_C}{I_E}$ ——— (1) mark.