

10- Calcular el punto de operación (Q) del sig. circ.  
 $V_E$ ,  $V_B$  y  $V_C$

$n=22$

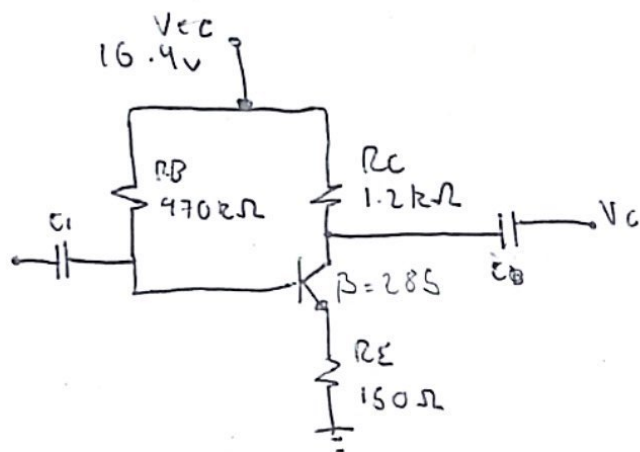
$$\beta = 175 + (n \times 5) = 285 \checkmark$$

$$V_{CC} = 12 + (n \times 0.2) V = 16.4 V \checkmark$$

$$R_{B1} = 470 k\Omega \checkmark$$

$$R_C = 1.2 k\Omega \checkmark$$

$$R_E = 150 \Omega$$



$$I_B = \frac{V_{CC} - V_{BE}}{R_{B1} + (\beta + 1)R_E} = \frac{16.4 - 0.7}{470k + (285 + 1)150}$$

$$I_B = 3.061025 \times 10^{-5} A$$

$$I_C = \beta I_B = 285 (3.061 \times 10^{-5})$$

$$I_C = 8.723922 \times 10^{-3} A$$

$$V_{CE} = V_{CC} - I_C (R_C + R_E)$$

$$= 16.4 - [8.7239 \times 10^{-3} (1200 + 150)]$$

$$= 4.6227 V$$

$$Q(8.7239 mA, 4.62 V)$$

$$V_B = V_{R_{B1}}$$

$$V_B = I_B R_{B1}$$

$$V_B = (3.061 \times 10^{-5}) (470k)$$

$$V_B = 14.3868 V$$

$$V_E = V_B - V_{BE} =$$

$$V_E = V_B - 0.7 V$$

$$V_E = 13.68 V$$

$$V_C = V_{R_C}$$

$$V_C = I_C R_C$$

$$V_C = (8.723 \times 10^{-3}) (1200)$$

$$V_C = 10.4687 V$$