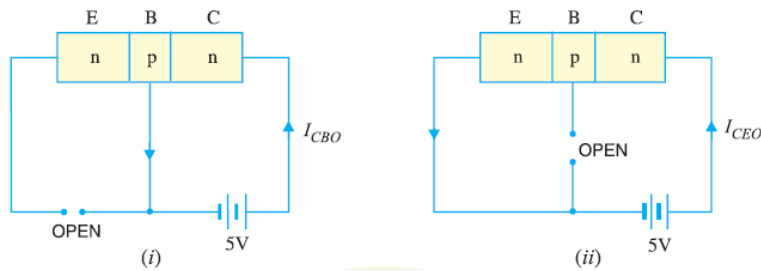1. An n-p-n transistor at room temperature has its emitter disconnected. A voltage of 5 V is applied between collector and base. With collector positive, a current of 0.2 μA flows. When the base is disconnected and the same voltage is applied between collector and emitter, the current is found to be 20 μA. Find α, IE and IB when collector current is 1 mA.
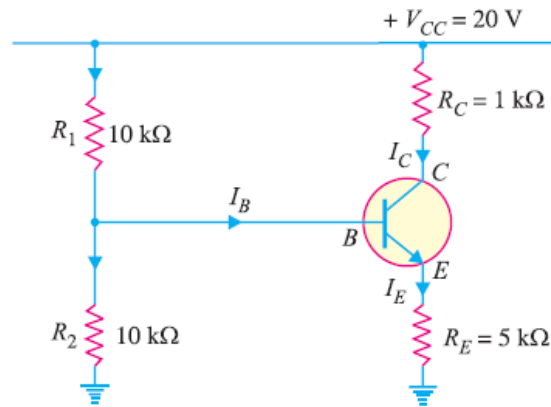

(i)   (ii)

2. Determine VCB in the transistor circuit shown in Fig. (i). The transistor is of silicon and has $\beta = 150$.

(i)   (ii)
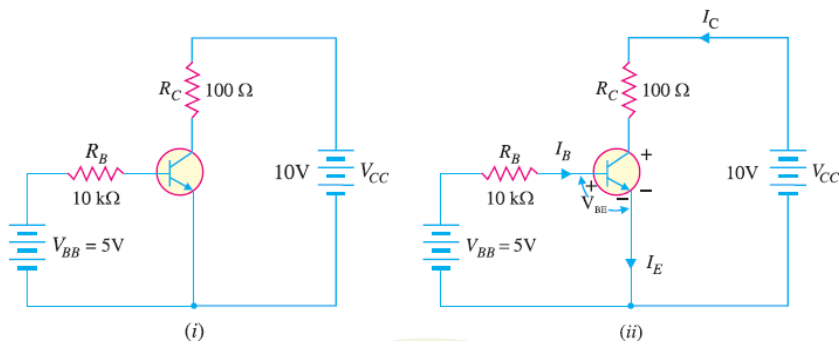
3. For the circuit shown in Fig. 30, find the transistor power dissipation. Assume that $\beta = 200$.
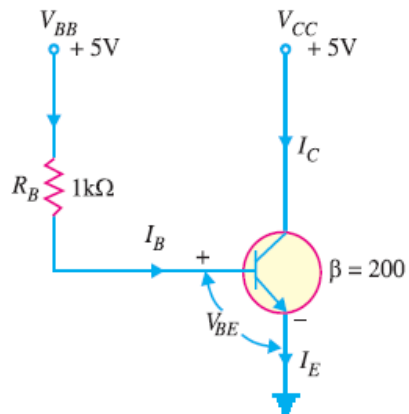
4. Calculate the emitter current in the voltage divider circuit shown in Fig. find the value of I_E, V_{CE} and collector potential V_C.

+ $V_{CC} = 20$ V

$R_C = 1$ kΩ

R_1 10 kΩ

I_C C

I_B

B

I_E E

R_2 10 kΩ

$R_E = 5$ kΩ

5. An npn transistor circuit as shown in Fig. has α = 0.985 and $V_{BE} = 0.3$V. If $V_{CC}=16$V, calculate R1 and R_C to place Q point at $I_C = 2$mA, $V_{CE} = 6$ volts.

+ $V_{CC} = 16$ V

I_1

R_C

R_1

I_B

I_2

V_{BE}

R_2 20 kΩ

2 kΩ