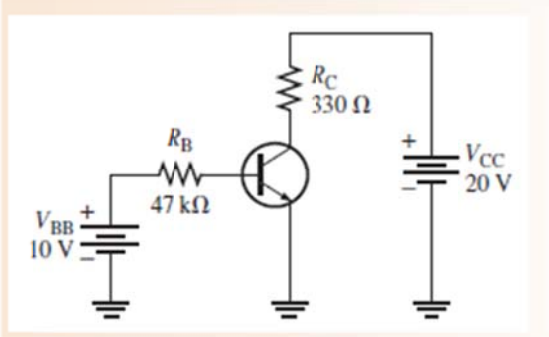
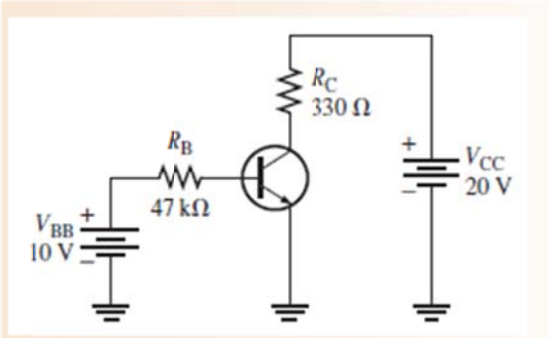
Electronic Circuits II – Tutorial 01

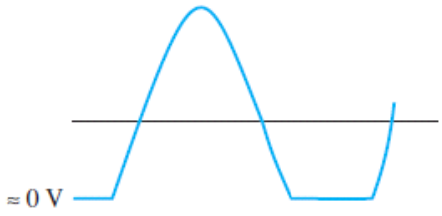
T & F

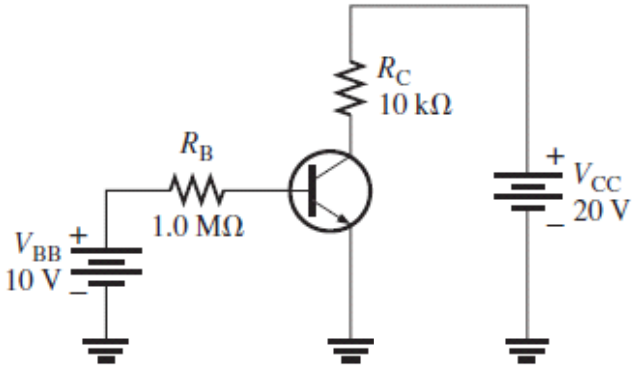
1	The linear region of a transistor's operation lies between saturation and cutoff.	T

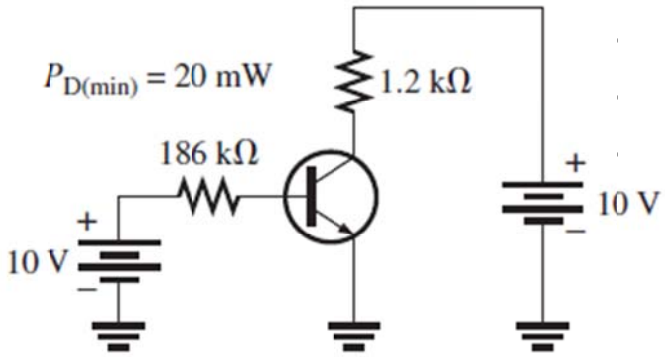
MCQ

#	Question	
1	If VBB in Figure is increased, the Q-point value of collector current will  (a) increase (b) decrease (c) not change	a
2	If VBB in Figure is increased, the Q-point value of VCE will  (a) increase (b) decrease (c) not change	b

Problems

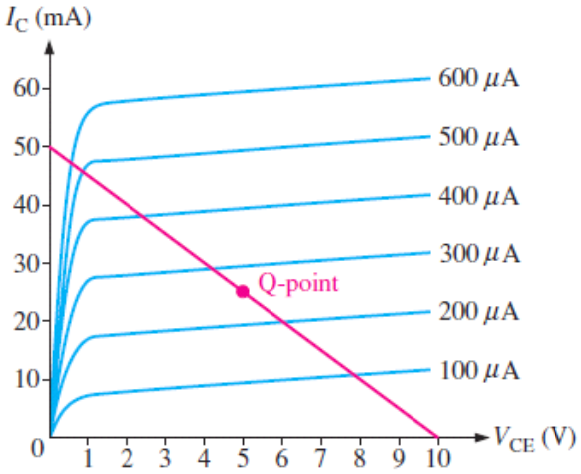
Q1	The output (collector voltage) of a biased transistor amplifier is shown in Figure . Is the transistor biased too close to cutoff or too close to saturation? 
Sol 1	.....

Q 2	Determine the intercept points of the dc load line on the vertical and horizontal axes of collector-characteristic curves for the circuit in Figure 
Sol 2	.... $V_{CE} = 20\ \text{V}; I_{C(sat)} = 2\ \text{mA}$ ....

Q3	Design a biased-transistor circuit using $V_{BB} = V_{CC} = 10$ V for a Q-point of $I_C = 5$ mA and $V_{CE} = 4$ V. Assume $\beta_{DC} = 100$. The design involves finding R_B, R_C, and the *minimum* power rating of the transistor. (The actual power rating should be greater.) Sketch the circuit.
Sol 3	

Q4

▶ FIGURE



From the collector characteristic curves and the dc load line in Figure , determine the following:

(a) Collector saturation current

(b) V_{CE} at cutoff

(c) Q-point values of I_B, I_C, and V_{CE}

Sol 4

(a) $I_{C(sat)} = 50\ \text{mA}$

(b) $V_{CE(CUTOFF)} = 10\ \text{V}$

(c) $I_B = 250\ \mu\text{A}; I_C = 25\ \text{mA}; V_{CE} = 5\ \text{V}$