Alexandria University
Faculty of Engineering
Electrical Engineering Department

ECE: Principles and Applications of Electronic Engineering
Sheet 5

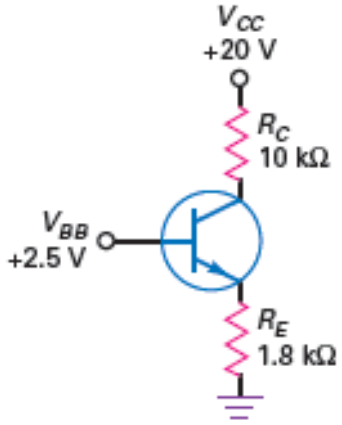

Figure 1

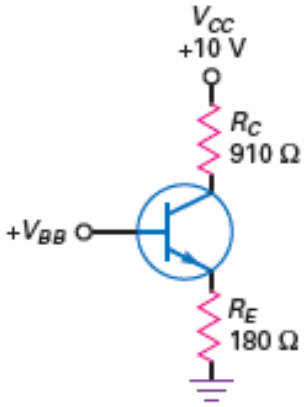

Figure 2

1. What is the collector voltage in Fig. 1? The emitter voltage?
2. If the emitter resistor is doubled in Fig. 1, what is the collector-emitter voltage?
3. If the collector supply voltage is decreased to 15 V in Fig. 1, what is the collector voltage?
4. What is the collector voltage in Fig. 2 if VBB 5 = V?
5. If the emitter resistor is doubled in Fig. 2, what is the collector- emitter voltage for a base supply voltage of 2.3 V?
6. If the collector supply voltage is increased to 15 V in Fig. 2, what is the collector-emitter voltage for VBB = 1.8 V?

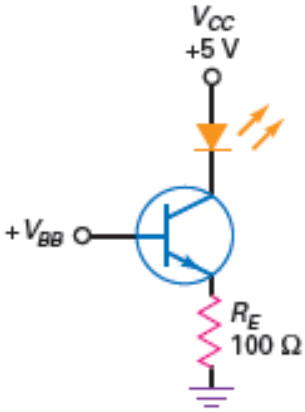

Figure 3

7. If the base supply voltage is 2 V in Fig. 3, what is the current through the LED?
8. If VBB = 1.8 V in Fig. 3, what is the LED current? The approximate VC?

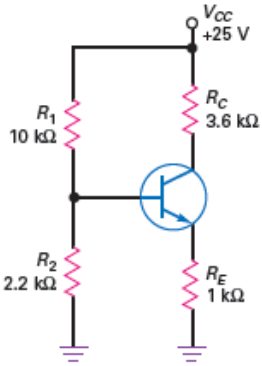

Figure 4

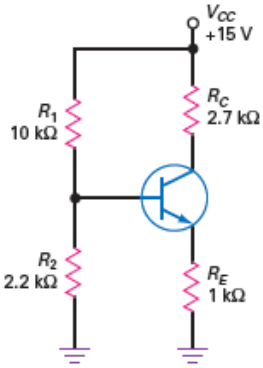

Figure 5

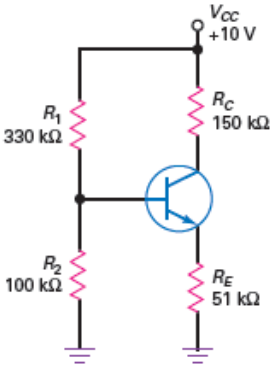

Figure 6

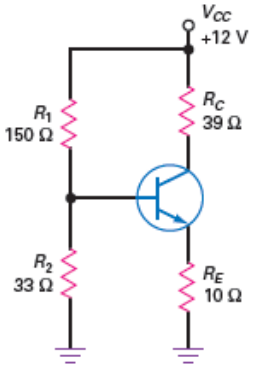

Figure 7

9. What is the emitter voltage in Fig. 4? The collector voltage?
10. What is the emitter voltage in Fig. 5? The collector voltage?
11. What is the emitter voltage in Fig. 6? The collector voltage?
12. What is the emitter voltage in Fig. 7? The collector voltage?
13. What is the Q point for Fig. 4?
14. What is the Q point for Fig. 5?
15. What is the Q point for Fig. 6?
16. What is the Q point for Fig. 7?

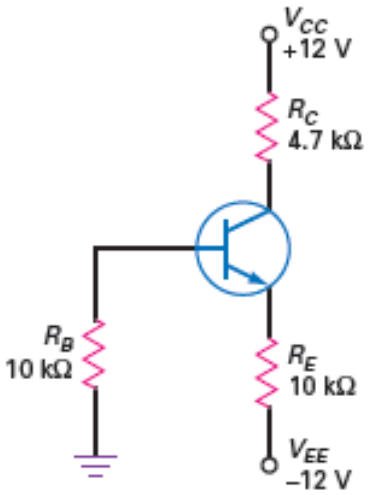

Figure 8

17. What is the emitter current in Fig. 8? The collector voltage?
18. If all resistances are doubled in Fig. 8, what is the emitter current? The collector voltage?
19. Does the collector voltage increase, decrease, or remain the same in Fig. 7 for small changes in each of the following?
    a. R1 increases d. RC decreases
    b. R2 decreases e. VCC increases
    c. RE increases f. βdc decreases

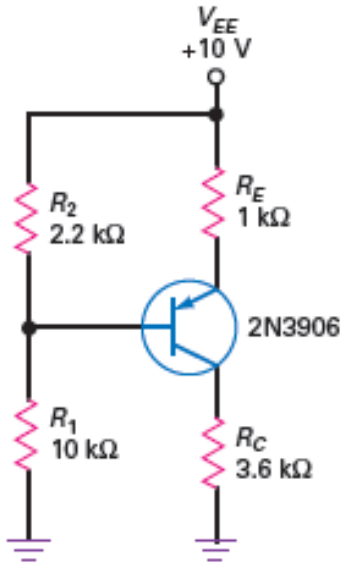

Figure 9

20. Does the collector voltage increase, decrease, or remain the same in Fig. 9 for small increases in each of the following circuit values?
    a. R1 d. RC
    b. R2 e. VEE
    c. RE f. βdc