Basic Electronics BJT amplifiers

Common-Emitter Fixed-Bias Configuration

1. For the network of Fig. 1:
a. Determine *Zi* and *Zo*.
b. Find *Av*.
c. Repeat parts (a) and (b) with *ro* = 20 kΩ.

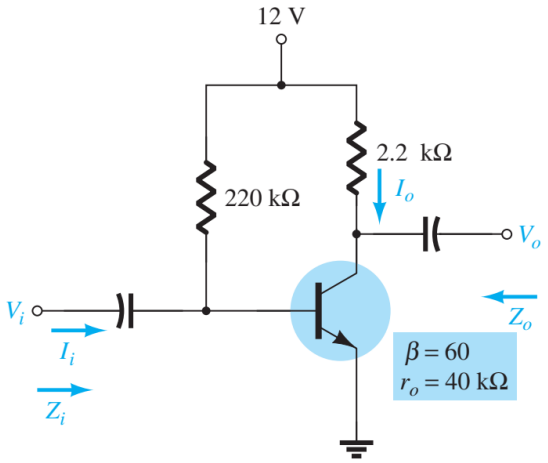

Fig.1

2. For the network of Fig. 2, determine *VCC* for a voltage gain of *Av* = -160.

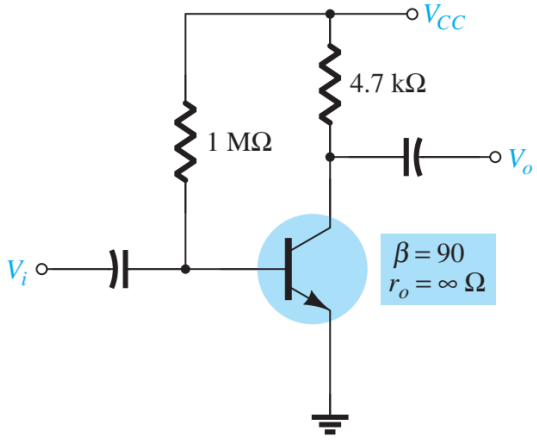

Fig.2

3. For the network of Fig. 3 :
a. Calculate *IB*, *IC*, and *re*.
b. Determine *Zi* and *Zo*.
c. Calculate *Av*.
d. Determine the effect of *ro* = 30 kΩ on *Av*.

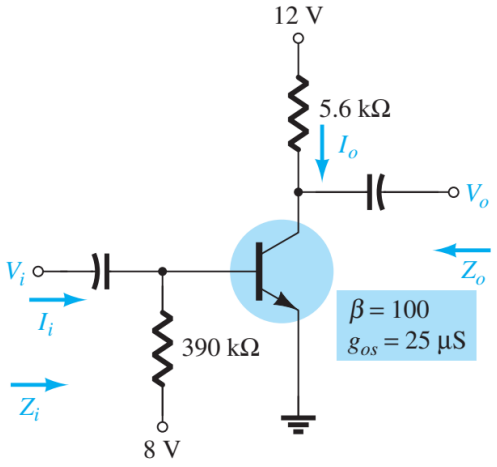

Fig.3

4. For the network of Fig. 3 , what value of *RC* will cut the voltage gain to half the value obtained in problem 3?

Voltage-Divider Bias

5. For the network of Fig. 4 :
a. Determine *re*.
b. Calculate *Zi* and *Zo*.
c. Find *Av*.
d. Repeat parts (b) and (c) with *ro* = 25 kΩ.

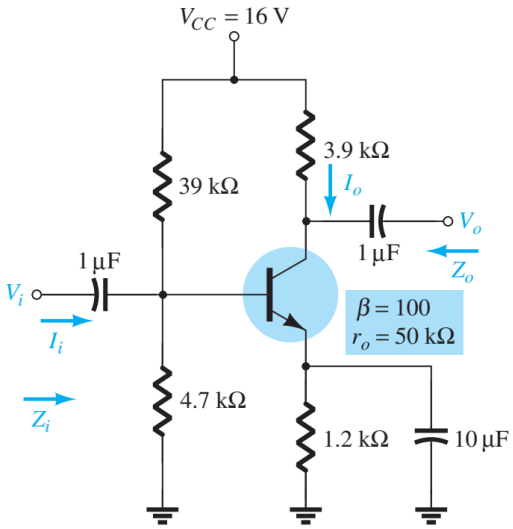

Fig.4

6. Determine *VCC* for the network of Fig. 5 if *Av* = -160 and *ro* = 100 kΩ.

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7. For the network of Fig. 6 :
a. Determine *re*.
b. Calculate *VB* and *VC*.
c. Determine *Zi* and *Av* = *Vo*>*Vi*.

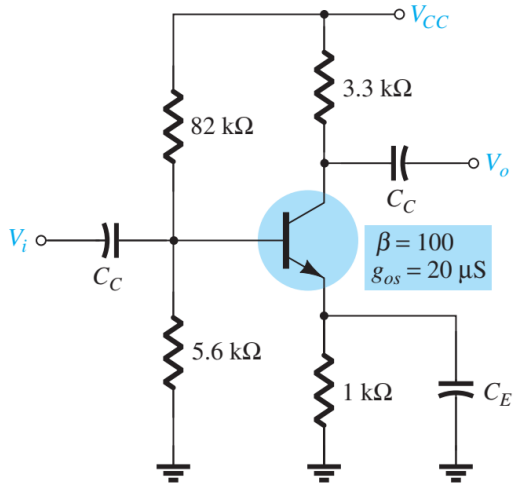

Fig.5

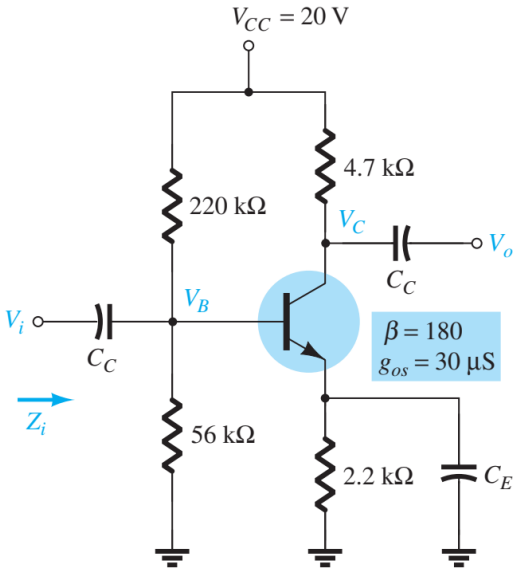

Fig.6

8. For the network of Fig. 7 :
a. Determine *re*.
b. Find *Zi* and *Zo*.
c. Calculate *Av*.
d. Repeat parts (b) and (c) with *ro* = 20 k.
9. Repeat Problem 8 with *RE* bypassed.
Compare results.

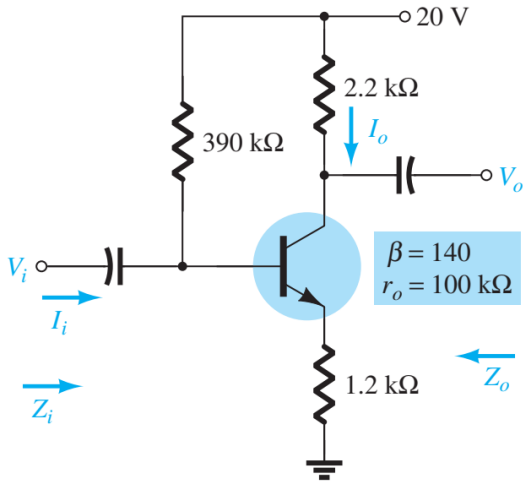

Fig.7

10. For the network of Fig. 8 :
a. Determine *re*.
b. Find *Zi* and *Av*.

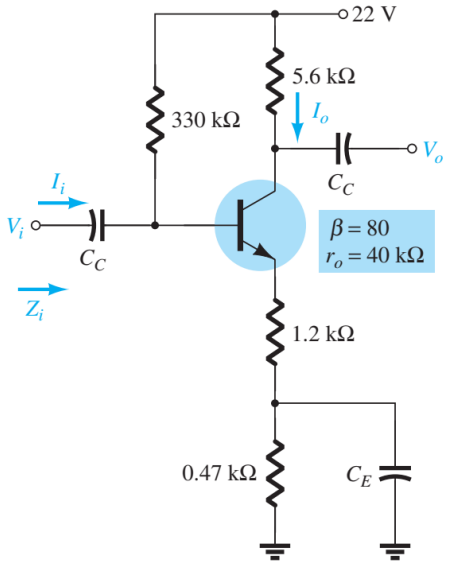

Fig.8