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reviewer2@nptel.iitm.ac.in ▼

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## Unit 6 - Week 5

### Course outline

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Week 5

- Lecture 25: BJT amplifier-1
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- Lecture 30: BJT amplifier-6
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Week 6

Week 7

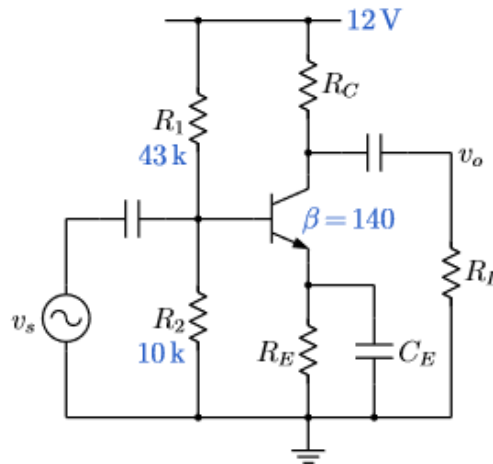
Week 8

Week 9

### Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-02-28, 23:59 IST**  
As per our records you have not submitted this assignment.

1) Consider the common-emitter amplifier shown in the figure. Assume that the BJT is operating **1 point** in the active region. For  $I_C$  to be  $1.3\text{mA}$ , what value  $R_E$  is required? (You may ignore the base current in this calculation.)



- $2\text{k}\Omega$
- $3.5\text{k}\Omega$
- $1.2\text{k}\Omega$
- $1.6\text{k}\Omega$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

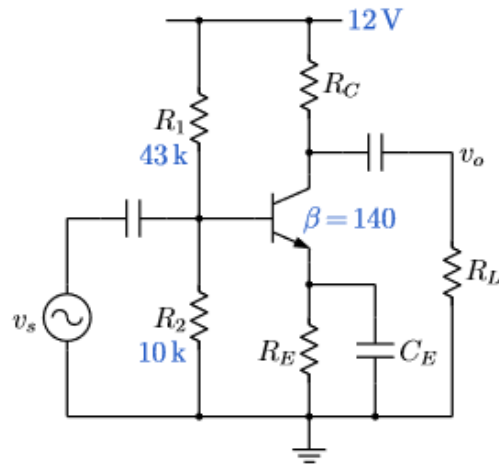
**1.2kΩ**

2) In the amplifier of Q-1, with  $R_E$  selected to ensure a collector current of  $1.3\text{mA}$ , what value **1 point** of  $R_C$  is required for the quiescent value of  $V_{CE}$  to be  $6\text{V}$ ?

Week 10

Week 11

Week 12



- 3.4k $\Omega$   
 2.2k $\Omega$   
 4.3k $\Omega$   
 2.9k $\Omega$

No, the answer is incorrect.

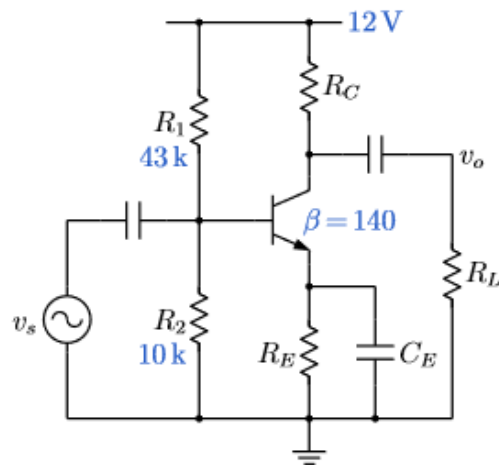
Score: 0

Accepted Answers:

3.4k $\Omega$

3) In the amplifier of Q-1, what is the transconductance ( $g_m$ ) of the BJT?

1 point



- 50m $\Omega$   
 68m $\Omega$   
 28m $\Omega$   
 80m $\Omega$

No, the answer is incorrect.

Score: 0

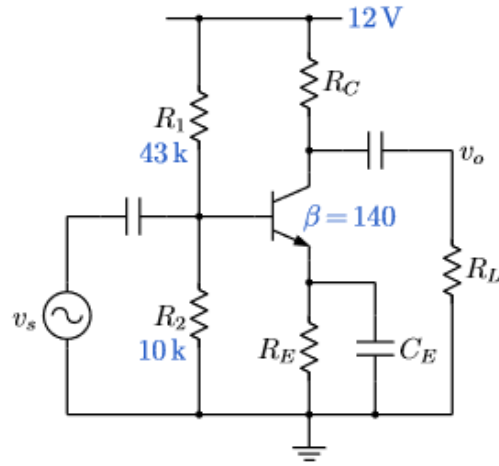
Accepted Answers:

50m $\Omega$

4)

1 point

In the amplifier of Q-1, what is the value of  $r_{\pi}$  of the BJT?



- 1.4k $\Omega$
- 3.5k $\Omega$
- 1.9k $\Omega$
- 2.8k $\Omega$

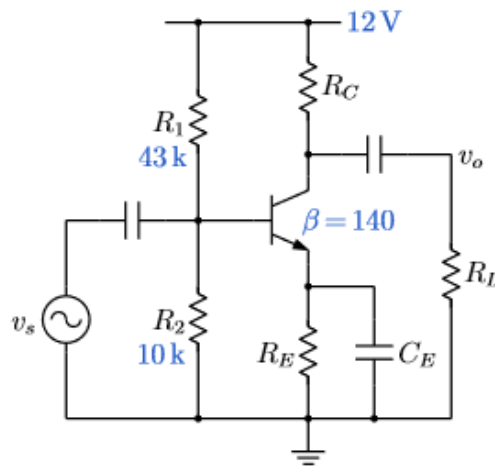
No, the answer is incorrect.

Score: 0

Accepted Answers:

2.8k $\Omega$

5) In the amplifier of Q-1, with  $R_E$  and  $R_C$  selected as before (see Q-1 and Q-2), what is the magnitude of the mid-band gain  $\frac{v_o}{v_s}$  if  $R_L$  is large? 1 point



- 75
- 126
- 170
- 220

No, the answer is incorrect.

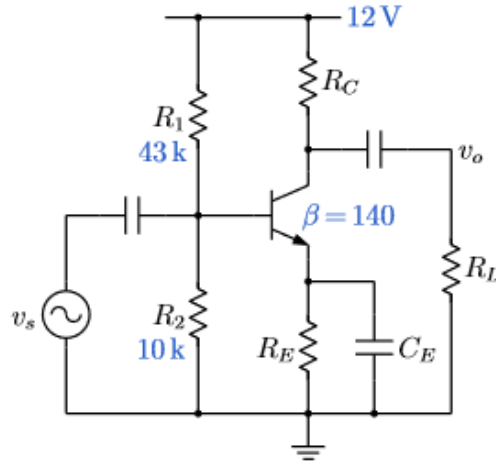
Score: 0

Accepted Answers:

170



6) In the amplifier of Q-1, with  $R_E$  and  $R_C$  selected as before (see Q-1 and Q-2), what is the magnitude of the mid-band gain  $\frac{v_o}{v_s}$  if  $R_L = 1k\Omega$ ? **1 point**



- 75
- 126
- 170
- 39

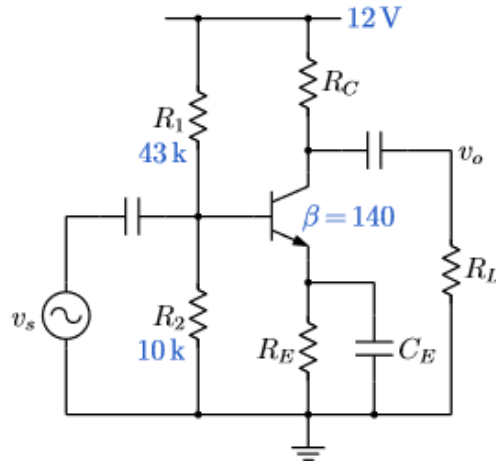
No, the answer is incorrect.

Score: 0

Accepted Answers:

39

7) In the amplifier of Q-1, a student has chosen by mistake a resistance  $R_E$  which is ten times larger than the value calculated in Q-1. Which of the following statements correctly describes the new bias value  $V_C$  and the new mid-band gain  $A_V$  (assuming  $R_L$  to be large)? **1 point**



- $V_C$  would increase,  $|A_V|$  would increase.
- $V_C$  would increase,  $|A_V|$  would decrease.
- $V_C$  would decrease,  $|A_V|$  would increase.
- $V_C$  would decrease,  $|A_V|$  would decrease.

No, the answer is incorrect.

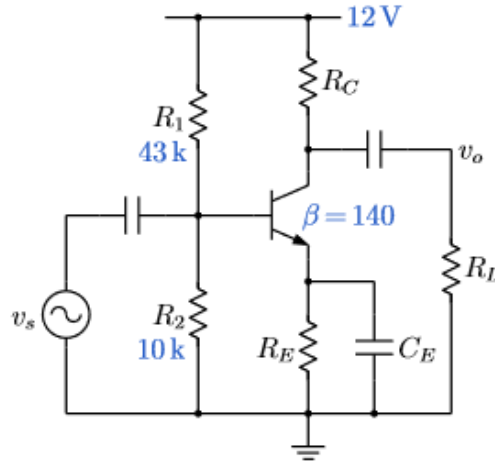
Score: 0

Accepted Answers:



$V_C$  would increase,  $|A_V|$  would decrease.

8) In the amplifier of Q-1, what is the input resistance seen by the source ( $v_s$ )? 1 point



- 2.1kΩ
- 2.8kΩ
- 10kΩ
- 8.1kΩ

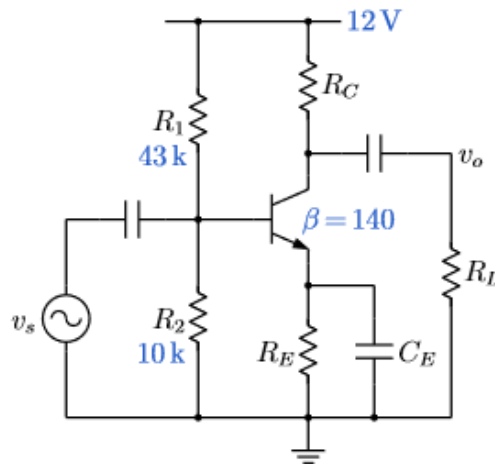
No, the answer is incorrect.

Score: 0

Accepted Answers:

2.1kΩ

9) In the amplifier of Q-1, the supply voltage  $V_{CC}$  is increased from 12 V to 15 V. Which of the following statements correctly describes the effect on the quiescent value of  $V_{CE}$  and the magnitude of the mid-band gain  $|A_V|$ ? 1 point



- $V_{CE}$  would increase,  $|A_V|$  would decrease.
- $V_{CE}$  would increase,  $|A_V|$  would increase.
- $V_{CE}$  would decrease,  $|A_V|$  would increase.
- $V_{CE}$  would decrease,  $|A_V|$  would decrease.

No, the answer is incorrect.

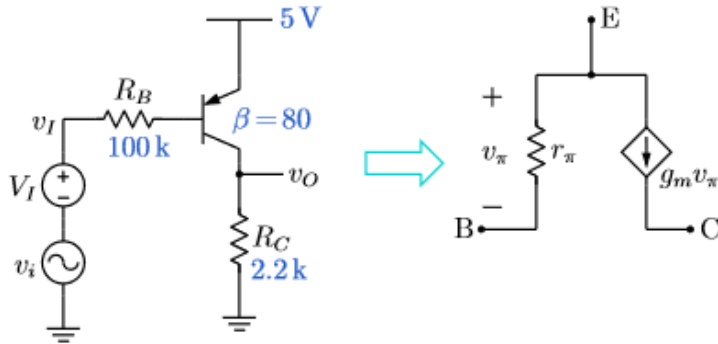
Score: 0

Accepted Answers:



$V_{CE}$  would increase,  $|A_V|$  would increase.

10) For the BJT circuit shown in the figure to work as an amplifier, what should be the minimum bias value of the input voltage ( $V_I$  in the figure)? **1 point**



- 0.6V
- 1.2V
- 1.6V
- 2.1V

No, the answer is incorrect.

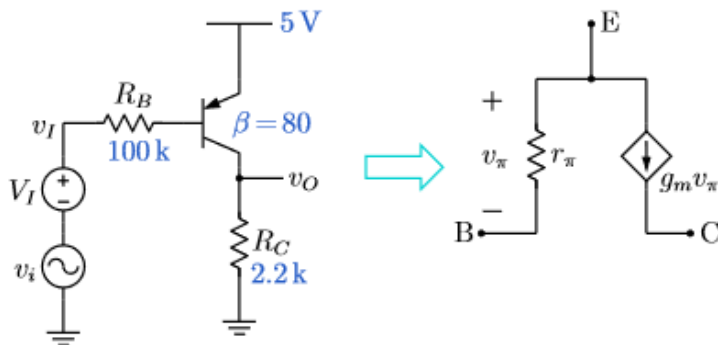
Score: 0

Accepted Answers:

1.6V

11) In the amplifier of Q-10,  $V_I$  is 3 V. What is the gain  $\frac{v_o}{v_i}$ ?

1 point



- 3.2
- 4.1
- 2.8
- 1.7

No, the answer is incorrect.

Score: 0

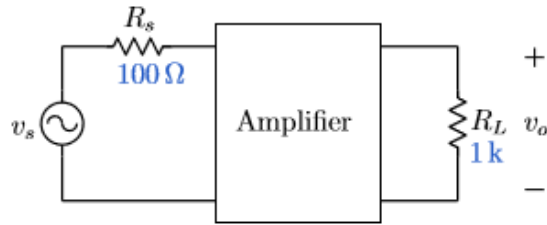
Accepted Answers:

-1.7

12) For the amplifier shown in the figure, the input resistance  $R_{in} = 1.2k\Omega$ , the output resistance  $R_{out} = 100\Omega$ , and the voltage gain  $A_V = 50$ . What is  $\frac{v_o}{v_s}$ ?

1 point





- 45.5
- 37.1
- 48.3
- 42

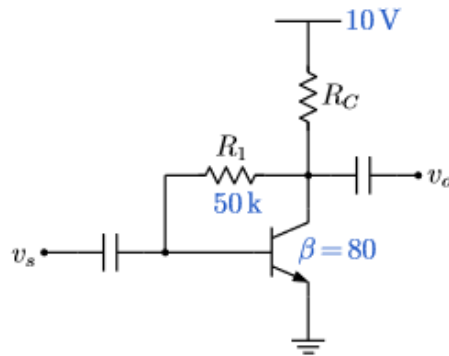
No, the answer is incorrect.

Score: 0

Accepted Answers:

42

13) In the amplifier shown in the figure, what value of  $R_C$  is required to ensure a bias current  $I_C = 1.6mA$ ? 1 point



- 5.1kΩ
- 3.9kΩ
- 4.7kΩ
- 2.9kΩ

No, the answer is incorrect.

Score: 0

Accepted Answers:

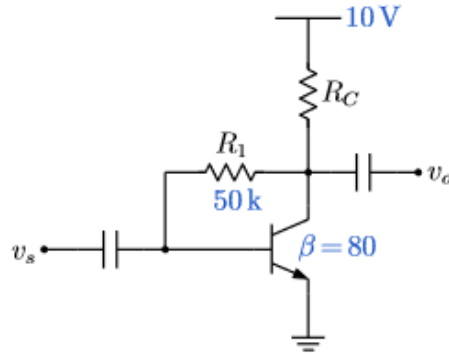
5.1kΩ

14)

1 point



For the amplifier of Q-13, what is the mid-band gain  $\frac{v_o}{v_s}$ ?



- 165
- 285
- 182
- 224

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

-285



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