

**University of Jordan
School of Engineering
Electrical Engineering Department**

**EE 204
Electrical Engineering Lab**

**EXPERIMENT 9 REPORT & PRE-LAB
TRANSISTOR APPLICATIONS**

Section # _____ Group # _____

Student Name

ID

- 1.
- 2.
- 3.
- 4.

EXPERIMENT 9

TRANSISTOR APPLICATIONS

PROCEDURE A - MULTIMETER TRANSISTOR TESTING

3. Which of the terminals is the "base" of the transistor?

.....

4. Finally, to identify the collector and emitter, we can use the fact that $V_{BE} > V_{BC}$. What are the measured V_{BE} and V_{BC} values?

.....

5. Draw below an illustration of the transistor and the pins you identified (similar to the above diagram but with the B, C and E terminals identified).

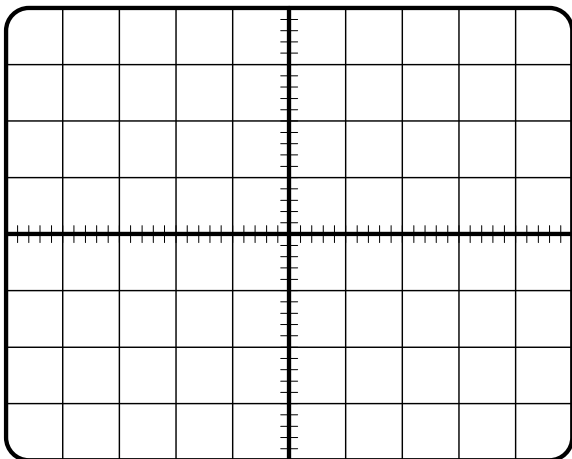
.....

PROCEDURE B - TRANSISTOR AMPLIFIER CIRCUIT

4. What is the difference between the signal you see on CH1 (input v_s) and the signal you see on CH2 (output v_{ce})?

.....

5. Draw the input signal v_s (CH1) you see on the oscilloscope screen below.



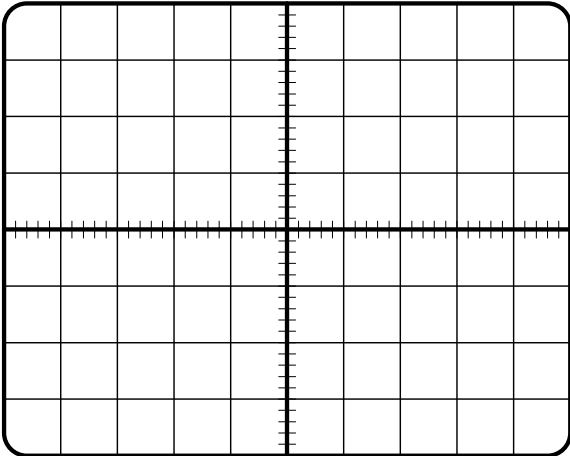
Volt/Div (CH1): _____

Time/Div: _____

Maximum value: _____ V

Minimum value: _____ V

6. Draw the output signal v_{ce} (CH2) you see on the oscilloscope screen below.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value: _____ V

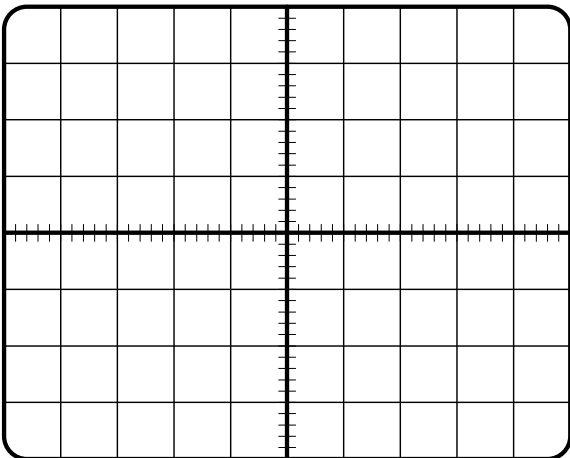
Minimum value: _____ V

7. Determine the voltage gain A_v of this amplifier circuit.

.....

8. Now change the resistor in the above circuit to $R_C = 3 \text{ k}\Omega$, while keeping the rest of the circuit unchanged.

9. Draw the output signal v_{ce} (CH2) you see on the oscilloscope screen below.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value: _____ V

Minimum value: _____ V

10. What is the new voltage gain A_v of the amplifier circuit?

.....

11. What is the equation that controls the voltage of this common-emitter amplifier circuit?

.....

PROCEDURE C - TRANSISTOR SWITCHING CIRCUIT

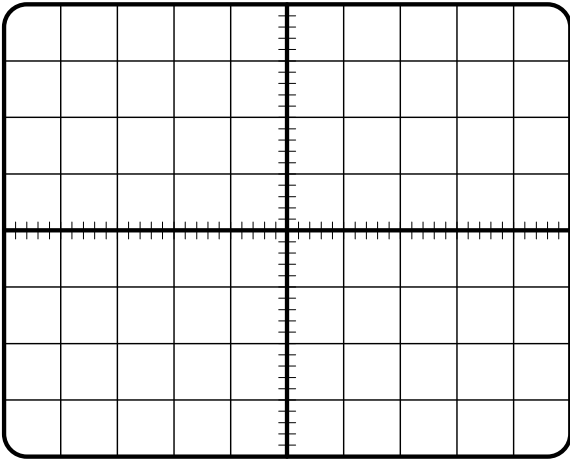
4. What does this circuit do? Describe the pattern you see from the LEDs.

.....

5. What is the difference between the signal you see on CH1 (v_{ce} on Q1) and the signal on CH2 (v_{ce} on Q2)?

.....

6. Draw the output signal (v_{ce} on Q1) you see on the oscilloscope on CH1 below.



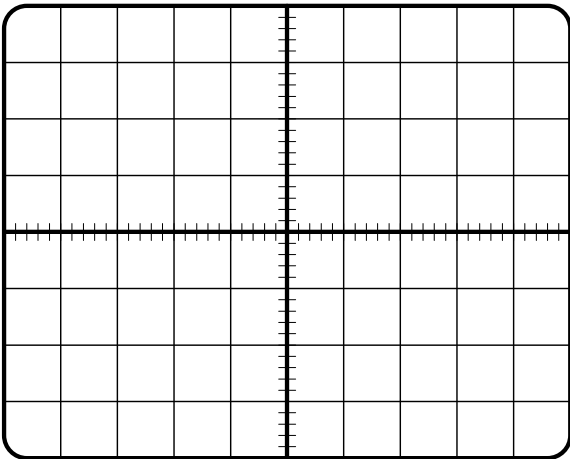
Volt/Div (CH1): _____

Time/Div: _____

Maximum value: _____ V

Minimum value: _____ V

7. Draw the output signal (v_{ce} on Q2) you see on the oscilloscope on CH2 below.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value: _____ V

Minimum value: _____ V

8. To turn the LED on and off the transistor is acting like a:

.....

9. Now change the resistors in the above circuit to $R_2 = 15000 \Omega$ and $R_3 = 15000 \Omega$, while keeping the rest of the circuit unchanged.

10. What has changed about the circuit behavior?

.....

