University of Jordan
School of Engineering
Electrical Engineering Department

EE 204
Electrical Engineering Lab

EXPERIMENT 8 REPORT & PRE-LAB
DIODE APPLICATIONS

Section # _____ Group # _____

	Student Name	ID
1.		
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EXPERIMENT 8
DIODE APPLICATIONS

PROCEDURE A – MULTIMETER DIODE TESTING

2. First, conduct the *forward bias* test, where the red multimeter lead (+ve) is connected to the anode terminal of the diode (+ve), and the black multimeter lead (COM) is connected to the cathode terminal of the diode (-ve). What is the reading on the multimeter screen?

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3. What does the above multimeter reading mean?

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4. Second, conduct the *reverse bias* test, where the red multimeter lead (+ve) is connected to the cathode terminal of the diode (-ve), and the black multimeter lead (COM) is connected to the anode terminal of the diode (+ve). What is the reading on the multimeter screen?

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5. What does the above multimeter reading mean?

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PROCEDURE B – DIODE V-I CURVE

Table 1

V_S **(V)**	**0.1**	**0.3**	**0.6**	**0.7**	**0.8**	**1**	**1.3**	**1.8**	**4.2**	**6.3**
I_D **(mA)**										
V_D **(V)**										

Table 2

V_S **(V)**	**0.3**	**0.7**	**1**	**1.8**	**4.2**	**6.3**
I_D **(mA)**						
V_D **(V)**						

10. Using the *measured* values in Tables 1 and 2, plot (**by hand**) the following figure using the graph paper attached at the end of the report: $\boldsymbol{I_D}$ on the y-axis versus $\boldsymbol{V_D}$ on the x-axis for both the forward bias and reverse bias regions on the same figure.

11. For the above plot, state your conclusions under the plot?

PROCEDURE C – HALF-WAVE RECTIFIER (FILTERED VS. UNFILTERED)

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

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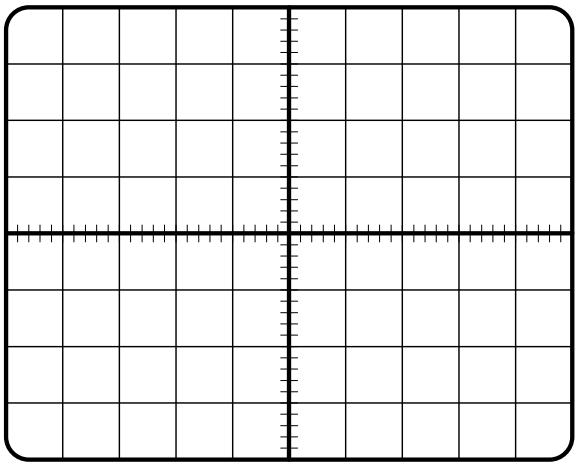
5. Draw the output signal v_R (CH2) you see on the oscilloscope screen below.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

9. What has changed for the new output signal v_R (on CH2) compared to the earlier plot? Is the new output signal closer to a DC signal compared to the earlier output or not?

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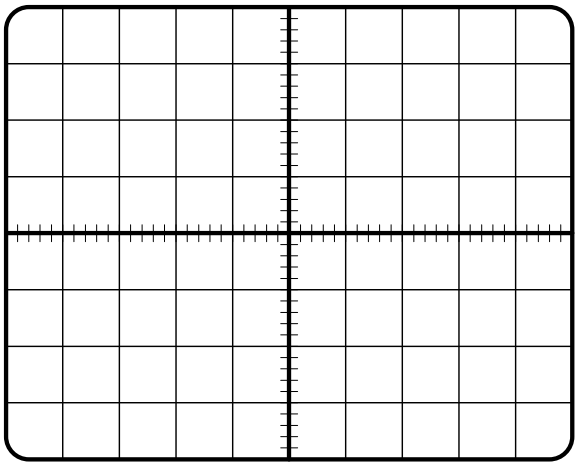
10. Draw the output signal v_R (CH2) you see on the oscilloscope screen below.



Volt/Div (CH2): _____

Time/Div: _____

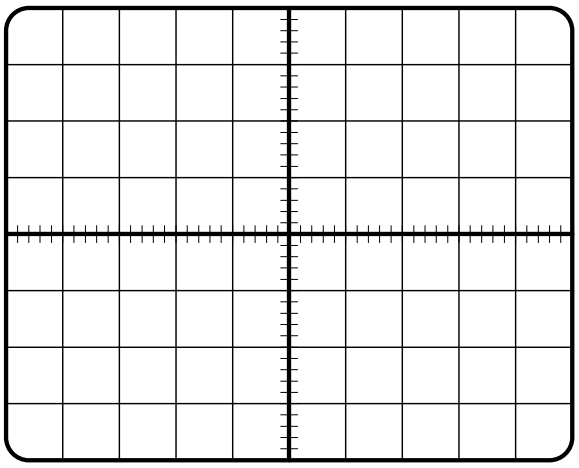
Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

12. Keep the same above circuit connected but now use R = 1000 Ω and C = 2.2 μF. Draw the new output signal (CH2) you see on the oscilloscope screen below, along with making the appropriate measurements next to the plot.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

13. What has changed on the output signal v_R on CH2? Is that output closer to a DC signal compared to the earlier output or not?

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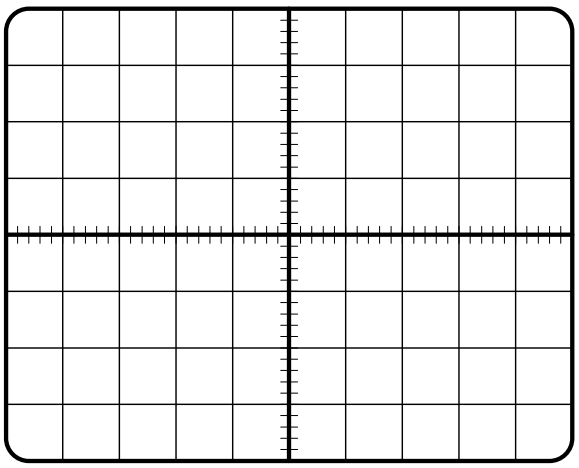
14. Using the same above circuit make sure you now use R = 4700 Ω and C = 2.2 μF. Draw the new output signal (CH2) you see on the oscilloscope screen below, along with making the appropriate measurements next to the plot.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

15. Is there a difference between this signal and the one you obtained in step 12 above? State your conclusions?

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16. What is the average value for a DC signal (not AC signal) that is V_s = 10 V?

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PROCEDURE D – FULL-WAVE RECTIFIER (FILTERED VS. UNFILTERED)

4. What is the difference between the signal you see on CH1 (input v_s) and the signal on CH2 (output v_R)? How is that different than a half-wave rectifier output (*see* procedure C)?

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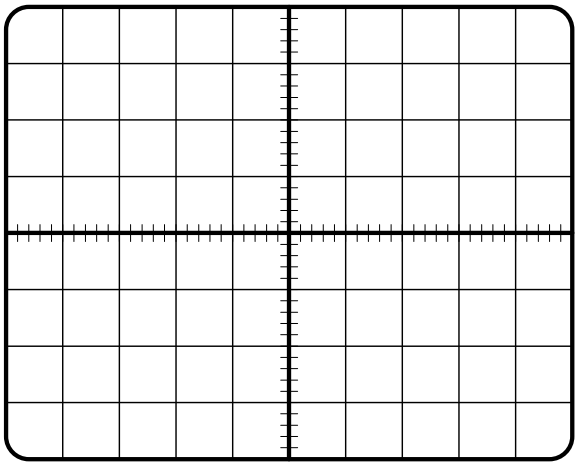
5. Draw the output signal v_R (CH2) you see on the oscilloscope screen below. You can use the **RUN/STOP button** on the oscilloscope to freeze CH2 if you have difficulty getting a stable signal due to triggering of the oscilloscope.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

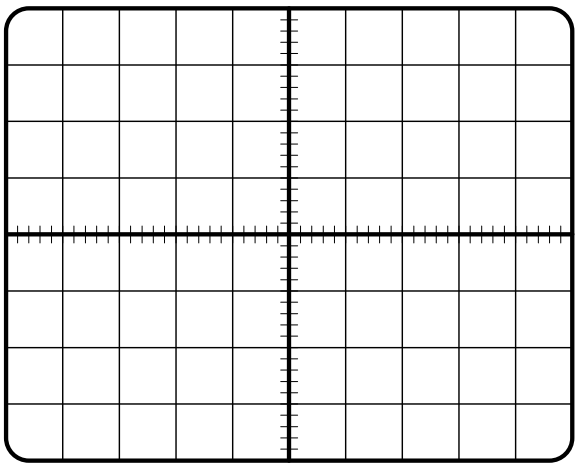
Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

9. What has changed for the new output signal v_R (on CH2) compared to the earlier plot? Is the new output signal closer to a DC signal compared to the earlier output or not?

. . . . . .

10. Draw the output signal v_R (CH2) you see on the oscilloscope screen below.



Volt/Div (CH2): _____

Time/Div: _____

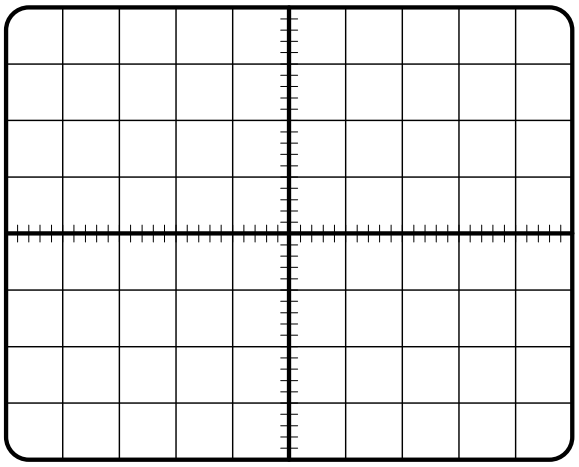
Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

12. Keep the same above circuit connected but now use R = 1000 Ω and C = 2.2 μF. Draw the new output signal (CH2) you see on the oscilloscope screen below, along with making the appropriate measurements next to the plot.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

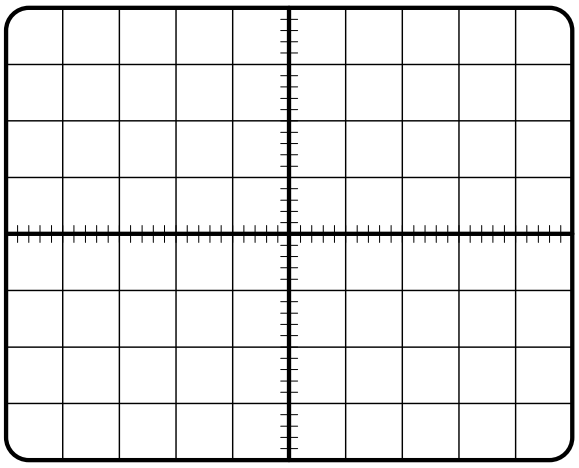
Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

13. What has changed on the output signal v_R on CH2? Is that output closer to a DC signal compared to the earlier output or not?

. . . . . .

14. Using the same above circuit make sure you now use R = 4700 Ω and C = 2.2 μF. Draw the new output signal (CH2) you see on the oscilloscope screen below, along with making the appropriate measurements next to the plot.



Volt/Div (CH2): _____

Time/Div: _____

Maximum value of v_R: _____ V

Minimum value of v_R: _____ V

Ripple of v_R (Max – Min): _____ V

Average value of v_R: _____ V

15. Is there a difference between this signal and the one you obtained in step 12 above? State your conclusions?

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CONCLUSIONS

Summarize in clear but concise format what you learned from this experiment:

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