CENGAGE | WEBASSIGN

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yathartha.regmi@ttu.edu

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← **PHYS 2401, section 201, Summer 2 2022**

Capacitance and Dielectrics (Homework)

🎓 INSTRUCTOR

Keith West
Texas Tech University

Current Score

QUESTION	1	2	3	4	5	6
POINTS	–/1	–/4	–/5	–/5	–/1	–/2

TOTAL SCORE	
–/18	0.0%

Due Date

THU, AUG 4, 2022
11:58 PM CDT

📅 Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

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1. **[–/1 Points]**   DETAILS   SERPSE10 25.2.P.003.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

When a potential difference of 174 V is applied to the plates of a parallel-plate capacitor, the plates carry a surface charge density of 26.0 nC/cm^2. What is the spacing between the plates?

[   ] μm

Need Help? [Read It]

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2. **[–/4 Points]**   DETAILS   SERPSE10 25.2.OP.005.MI.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

An air-filled capacitor consists of two parallel plates, each with an area of 7.60 cm^2, separated by a distance of 2.20 mm. A 25.0-V potential difference is applied to these plates.

(a) Calculate the electric field between the plates.

[   ] kV/m

(b) Calculate the surface charge density.

[   ] nC/m^2

(c) Calculate the capacitance.

[   ] pF

(d) Calculate the charge on each plate.

[   ] pC

Need Help? [Read It] [Master It]

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3. **[–/5 Points]** | DETAILS | **SERPSE10 25.3.OP.007.**

| MY NOTES | ASK YOUR TEACHER | PRACTICE ANOTHER |

Two capacitors, C_1 = 6.00 μF and C_2 = 15.0 μF, are connected in parallel, and the resulting combination is connected to a 9.00-V battery.

(a) Find the equivalent capacitance of the combination.

[   ] μF

(b) Find the potential difference across each capacitor.

V_1 = [   ] V

V_2 = [   ] V

(c) Find the charge stored on each capacitor.

Q_1 = [   ] μC

Q_2 = [   ] μC

Need Help? [Read It] [Watch It]
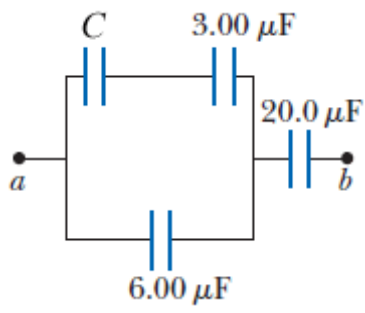
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4. [–/5 Points]   DETAILS   SERPSE10 25.3.P.011.MI.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

Four capacitors are connected as shown in the figure below. (Let C = 18.0 μF.)

(a) Find the equivalent capacitance between points a and b.

⬚ μF

(b) Calculate the charge on each capacitor, taking ΔV_{ab} = 11.0 V.

20.0 μF capacitor   ⬚ μC

6.00 μF capacitor   ⬚ μC

3.00 μF capacitor   ⬚ μC

capacitor C ⬚ μC

Need Help?   Read It   Master It

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5. [–/1 Points]   DETAILS   SERPSE10 25.4.OP.014.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

A professor connects an 18.0 V battery to a capacitor of unknown capacitance. The result is that 48.2 μC of charge is stored on the capacitor. How much energy (in J) is stored in the capacitor?

⬚ J

Need Help?   Read It

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6. **[–/2 Points]**   DETAILS   **SERPSE10 25.5.P.025.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

(a) Determine the capacitance of a Teflon-filled parallel-plate capacitor having a plate area of 1.85 cm^2 and a plate separation of 0.030 0 mm.

[   ] pF

(b) Determine the maximum potential difference that can be applied to a Teflon-filled parallel-plate capacitor having a plate area of 1.85 cm^2 and a plate separation of 0.030 0 mm.

[   ] kV

Need Help? [Read It] [Watch It]

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