

Physics 112-01
Make-Up Test 1
February 26, 2014

Name: _____

Code Name (if you want your grades posted): _____

Be sure to show your work **clearly** and **draw a box around your answer**. If any question is unclear, please ask immediately.

1. (20 pts.) A heart defibrillator delivers 400 J of energy by charging a capacitor to 10,000 Volts and then discharging it rapidly (in 0.01 s) to deliver a quick “jolt”. What is the capacitance of the capacitor?

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$$U = \frac{1}{2} C V^2$$

$$C = \frac{2U}{V^2} = \frac{2(400\text{J})}{(10,000\text{V})^2} = \boxed{8 \times 10^{-6} \text{ F}}$$

Aside: average power =

$$P = \frac{\text{Energy}}{\text{time}} = \frac{400\text{J}}{0.01\text{s}} = \boxed{40,000 \text{ Watts}}$$