

P196 Study Guide for Test 1 - Fall 2008

Chapter 23

Electric Charge, Electric Force and Electric Fields

Coulomb's Law

Charging by Induction

Electric Fields of continuous charge distributions

Motion of charged particles in an Electric Field

Millikan's Oil Drop Experiment and the Action Potential

Figures: 23.1-6

Equations: 23.1, 23.6, 23.7, 23.8, 23.9, 23.11, 23.12

Examples: 23.2, 23.3, 23.4, 23.5, 23.6, 23.7, 23.10

Quick Quiz Questions: 1, 2, 3, 4, 5

WebAssign

Conceptual Questions:

Basic Problems: 2, 3, 4, 5, 6, 8, 13, 20, 25, 22, 32, 33, 34, 36, 37, 38, 39,

Med. Problems: 7, 10, 14, 15, 16, 17, **21**, 23, 28, 30, 40, 41, 42, 43, 44, 47, 48, 49, 50, 51

*Please do not think you have to do all of these! Many are the same concepts, same equations and same solutions! You have already done many of these on Mastering Physics. We have done many problems in class, as well. **Bold** and **Blue** are possible DRS problems.*

Chapter 24

Electric Flux

Gauss's Law

Conductors in EE

Figures: 24.3, 24.6-9, 24.14-16,

Equations: 24.2, 24.3, 24.4, 24.6, 24.9

Examples: 24.1, 24.3, 24.4, 24.5, 24.7

Quick Quiz Questions: 1, 2, 3

WebAssign

Conceptual Questions:

Basic Problems: 17, 18, 20, 23, 24, 25, 29, 31, 34, 36, 37, 38, 39, 50,

Medium Problems: 27, 28, 30, 32, 33, 40, 41, 42, 45, 46, 47,

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Chapter 25

Electric Potential Energy, Electric Potential

Figures: all

Equations: 25.1, 25.3, 25.5, 25.6, 25.7, 25.11, 25.13, 25.15, 25.17, 25.20

Examples: 25.1, 25.2, 25.4, 25.5, 25.7, 25.8

Quick Quiz Questions: 1, 2, 3, 4

WebAssign

Conceptual Questions:

Basic Problems: 1, 2, 3, 4, 5, 6, 15, 20, 34, 48, 51

Medium Problems: 7, 8, 9, 16, 17, 26, 27, 29, 31, 35, 36, 46,

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Chapter 26

Capacitance and Capacitors

Electric Dipoles

Dielectrics

Figures: 26.2, 26.7, 26.8, 26.10, 26.14, 26.17, 26.19

Equations: 26.1, 26.2, 26.3, 26.8, 26.10, 26.11, 26.14, 26.18, 26.20

Examples: 26.1, 26.1, 26.3, 26.7

Quick Quiz Questions: 1,2,3,4,5

WebAssign

Conceptual Questions:

Basic Problems: 1, 2, 3, 4, 6, 8, 9, 16, 17, 29, 32, 37, 38,

Medium Problems: 7, 11, 12, 18, 21, 22, 23, 28, 34, 36, 42, 44

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There will be **1 DRS problem** that require a complete explanation. You will be required to draw a complete organized diagram, provide necessary and sufficient **reasoning** and **solve the problem**. Avoid writing in paragraphs. Utilize bullets or numbered steps to separate your thoughts. *Be clear, concise and complete.*

***Diagram, Reason and Solution Method**

1) **Read the Problem.** Many of these problems are quite relevant. Reread the problem. This is really important. Read it slowly. Relax. There are no tricks. The strict wording of the problem is to train you to look closely at the question.

2) **Draw a Diagram.** Visualize the problem. Your diagram demonstrates your understanding more than you think! Can artwork sum up your mood? Do artists find patterns that resonate with your personality? Your diagram speaks for you. They are not your dirty laundry. Imagine that someone is analyzing your diagram. What do you think they think of your representation of this problem? Be meticulous, be complete, be clear, and be artistic. If your diagram is all of this---there should be few questions asked!

3) **What is given in the problem?** Start to use the clues given to you. What else do you know that is not given?

4) **What are you solving for?** Keep returning to this. You will forget.

5) **Reason out your path to a solution.** Explain it to yourself or a group member. What were the main concepts and guideposts that will help you discover the solution to this problem? Internalize this process! You will use it again and again. *You must articulate your learning process through dialogue, diagramming and reasoning.*

6) **Find and utilize appropriate equations**---manipulate them. Do not use derived equations. It's like getting a birthday cake from Von's. Someone else put standard equations together. These equations are maps created by people before you. Do you always follow the map? Look at the equation for what it is and--it is not. Equations have feelings, too! Give them quality time.

7) ~~Plug, Shove and find the Solution.~~ This is the easy part. The calculator does the work. Monkeys can punch in numbers!

8) **Check and reflect on your answer.** How did this particular solution process relate to other solutions you have already done? How can you generalize this solution process for future problems? How does the answer compare to your prediction