__Do not use a solution manual__. Use your own words, diagrams and starting points to synthesize your answers. Do not work in groups greater than three. __Work the problems out on scratch paper, first__.
*Your grade is based upon **neatness**, **organization**, **completeness** and **correctness**.*
*Please do not cut and paste. There are 4 extra credit problems worth **28 extra credit points.***

Chapter 27

1) According to classical theory conductivity and resistivity do not depend on the electric field. Use diagrams and equations to develop Paul Drude's theory for **electrical conduction**. *Extra Credit problem-7 points*

2) **Question** #9 (7th Ed.), #16 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

3) **Problem** #7 (7th Ed.), #9 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

4) **Problem** #42 (7th Ed.), #55 (6th ed.) Change the value of the 3C capacitor to 4.8C. Use diagrams, reasoning and solve the problem. 10 points

Chapter 28

5) **Question** #11 (7th Ed.), #29 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

6) **Problem** #14 (7th Ed.), #19 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

7) Explain and show how a **voltmeter** and an **ammeter** operates. Draw the circuits for the meters as well as the meters in a circuit. *Extra Credit problem-7 points*

8) **Problem** #61 (7th Ed.), #71 (6th ed.) Use 12.4V for the power source and 18.5µF for the capacitor. Use diagrams, reasoning and solve the problem. Explain what is happening in the circuit when the switch is closed and then opened. 10 points

Chapter 29

9) Explain the **Hall Effect**. Explain and show how the **Hall Effect** can be used to measure the magnetic field in a certain region. *Extra Credit problem-7 points*

10) **Problem** #43 (7th Ed.), #53 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

11) **Problem** #29 (7th Ed.), #15 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

12) **Problem** #55 (7th Ed.), #63 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

Chapter 30

13) Explain the **Biot Savart Law**. Demonstrate what the cross product means. Use **Problem** #10 (7th Ed.), #7 (6th ed.) to explain. 10 points

14) Using Fleisch, explain **Gauss's Law for Magnetism**. Explain each component of the equation and use a diagram. Provide an example. 10 points

15) **Problem** #19 (7th Ed.), #18 (6th ed.) Use diagrams, reasoning and solve the problem. 10 points

16) Using Fleisch, explain the **Ampere-Maxwell Law**. Explain each component of the equation and use a diagram. *Extra Credit problem-7 points*