Physics 1A Semester 2 Midterm Test Review

Review Schedule:

- March 28- April-9: Work on Semester Review Practices
- Monday, April 9: Complete Crib Sheet in the Classroom ONLY
- Tuesday, April 10: Semester Midterm Test (Electricity Units)

The Test:

- The test is worth 60% of your overall semester test grade. The other 40% will come from the Waves Final (with will be taken during Semester Test days at the end of the semester). The two tests together (Electricity Final and Waves Final) will be 14% of your semester grade.
- Test will be taken through BlackBoard Learn. Know your user name and password.
- 35 questions: 7 true/false, 18 multiple choice/jumbled sentence and 10* fill-in-the-blank (*calculation required)
- A calculator is needed (calculator apps may NOT be used).
- I will provide NO equations. You may write all equations on your Crib Sheet.
- Bring a book to read or something to keep yourself occupied (just in case you complete the test early).
- You will not be allowed to leave the classroom during the testing period.

General Overview:

In order for the review to be most helpful, it is necessary for you to work through the practices and come to class prepared to ask questions for clarification and review. In addition, you should look over notes to help study!

The Review:

The Test is divided by topics (or units). Practice questions can be found on BlackBoard Learn. Use the practices in the Semester Review Folder. Each set of questions consists of 5 multiple choice, true/false and fill-in-the-blank questions. Use these questions to prepare for the test. Test questions will be randomly generated from these reviews. **Review practices can be completed multiple times to prepare for the test.**

Notice the number in the box…that is the number of test questions from the section.

6

Unit 8-Electrostatics

electrostatics conduction induction Coulomb's Law

6

Unit 9- Electric Field

electric force electric field electric potential

7

Unit 10- Electric Current

current Ohm's Law electrical power electrical energy

7

Unit 11- Electric Circuits

series circuits parallel circuits comparing circuits

8

Unit 12 – Magnets

magnetic field and magnetic force magnets and current electromagnet right hand rules

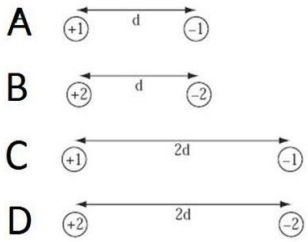
Questions can be completed via Blackboard multiple times to prepare for the Semester Midterm Test.

Sem 2 Unit 8 Electrostatics

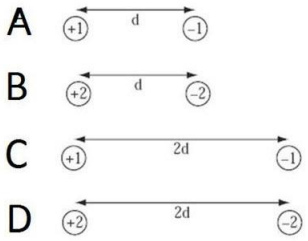
1. Silver, copper, and gold are examples of good electric _____.
2. Materials that are often used to insulate wires that conduct electricity are _____.
3. Static charge is the buildup of protons. *True or False*
4. Sparks and lightning are the same principle. *True or False*
5. A repelling force occurs between two charged objects when the charges are of _____.

Sem 2 Unit 8 Coulomb's Law

1. The distance between two charges is represented by d. In which of the following diagrams is the attractive force between the two charges the greatest?



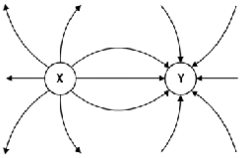
2. The distance between two charges is represented by d. In which of the following diagrams is the attractive force between the two charges the least?



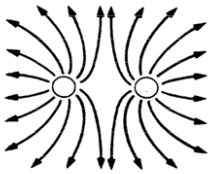
3. What occurs when two charges are moved closer together?
4. Joann has rubbed a balloon with wool to give it a charge of -__-__C. She then acquires a plastic golf tube with a charge of +__-__ C localized at a given position. She holds the location of charge on the plastic golf tube a distance of [d] m above the balloon. Determine the electrical force of attraction between the golf tube and the balloon. *Round answer to the nearest hundredths and include the unit.*
5. Two balloons are charged with an identical quantity and type of charge: -__-__ C. They are held apart at a separation distance of [d] m. Determine the electrical force of repulsion between them. *Round answer to the nearest hundredths and include the unit*

Sem 2 Unit 9 Electric Field

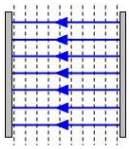
1. Electric field lines around two charges are shown in the diagram. Identify the type of charges on the object X or the left [X] and object Y on the right [Y].



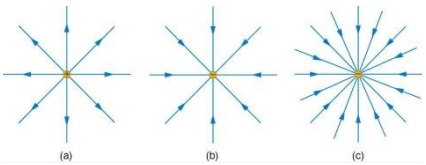
2. Study the electric field line shown below. What are the charges?



3. The figure below shows two parallel plates. Determine the charges on the parallel plates based on the direction of the field lines.



4. Willa the witch dusts her crystal ball with her silk scarf, causing the ball to become charged __-__C. Willa then stares into the crystal ball and the wart on the end of her nose experiences an electric field strength of __-__N/C. What is the resulting force on her wart?
5. Which field force is the strongest?

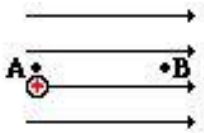


Sem 2 Unit 9 Electric Potential

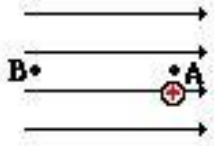
1. In which case is electrical potential energy increasing?
   a) Two protons moving towards each other.
   b) An electron moving away from a negative plate.
   c) A proton moving away from a proton.
   d) An electron and proton moving closer together.

2. Moving an electron within an electric field would change _____ the electron.

3. The following diagrams show an electric field (represented by arrows) and two points - labeled A and B - located within the electric field. A positive test charge is shown at point A. Must work be done upon the charge to move it from point A to point B?



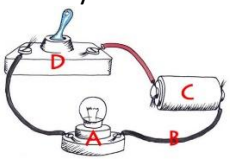
4. The following diagram shows an electric field (represented by arrows) and two points - labeled A and B - located within the electric field. A positive test charge is shown at point A. Must work be done upon the charge to move it from point A to point B?



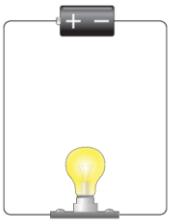
5. James recharges his dead 12.0 V car battery by sending __-___C of charge through the terminals. How much electrical potential energy must James store in the car battery to make it fully charged?

Sem 2 Unit 10 Electric Current

1. Identify the resistance in the circuit below.



2. Which statement is correct about the simple circuit shown below?



   a) The current flowing into the light bulb is the same as the current flowing out of the lightbulb.
   b) The current flowing into the light bulb is the more than the current flowing out of the lightbulb.
   c) The current flowing out of the battery is less than the current flowing into the battery.

3. Resistance opposes the flow of current.
   True or False

4. A medium-sized household oscillating fan draws __-___A of current when the potential difference across its motor is __-___V. How large is the fan's resistance? *Round answer to the nearest tenths.*

5. A window-unit air conditioner has an overall resistance of __-___Ω. If the voltage across the air conditioner equals __-___V, what is the current in the air conditioner's circuit? *Round answer to the nearest tenths and include the unit.*

Sem 2 Unit 10 Electric Power

1. The power ratings on lightbulbs are measures of the _____.

2. The rate at which an electrical device converts energy from one form to another is called ____.

3. A dryer is plugged into a __-___A wall outlet. What is the voltage in a dryer if the dryer uses __-___W of power?

4. The unit of power is the kilowatt-hour. True or False

5. A typical car headlight puts out about 50 watts at 12 volts. How many amps flows through the headlight? *Round answer to the nearest tenths and include the unit in your answer.*

Sem 2 Unit 10 Electric Energy

1. How many pennies does it cost to use your ___-___W microwave for [m] minutes every day for a week if your electric company charges 9 cents per kWh?

2. How many pennies does it cost to operate a ___-___W soldering iron for [t] hours if energy costs ___-___¢ per kWh?

3. One kilowatt-hour is equal to the energy consumed by an electric device of 1 W for 1 hour. *True or False*

4. Using a 1-kW heater for one hour consumes more energy than using a 100-W bulb for one day. *True or False*

5. Different household appliances use electrical energy at different rates. *True or False*

Sem 2 Unit 11 Series Circuit

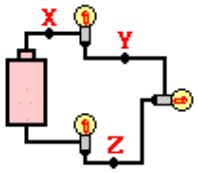
1. A circuit that has two or more separate branches for current is a _____.

2. How many paths through which charges can flow would be shown in a circuit diagram of a series circuit?

3. Four resistors having resistances of 20 Ω, 40 Ω, 60 Ω, and 80 Ω are connected in series across an ideal dc voltage source. If the current through this circuit is 0.50 A, what is the voltage of the voltage source?

4. A series circuit consists of a switch, a 6-V battery, a lightbulb, and some copper wire. Whenever the circuit is turned on, each of these elements has the same _____.

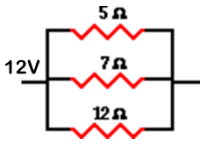
5. Three identical light bulbs are connected to a D-cell as shown below. Which one of the following statements is true?



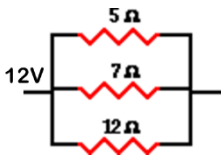
   a) All three bulbs will have the same brightness.
   b) The bulb between X and Y will be the brightest.
   c) The bulb between Y and Z will be the brightest.
   d) The bulb between Z and the battery will be the brightest.

Sem 2 Unit 11 Parallel Circuit

1. A 5.0 Ω 7.0 Ω and 12 Ω resistor are placed in parallel. Which resistor has the most current flowing through it?



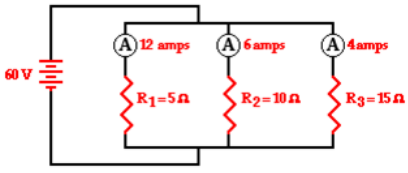
2. What happens to the circuit's equivalent resistance and the total current if another 5Ω resistor is added and connected on a separate parallel path to the circuit shown above? The circuit's equivalent resistance will _____ and the total current will _____ .



3. A parallel circuit has 4 resistors each on different paths connected to a 120 V potential difference.
   R1 = ___-___Ω R2 = ___-___Ω
   R3 = ___-___Ω R4 = ___-___Ω
Determine the total current flowing through the circuit?

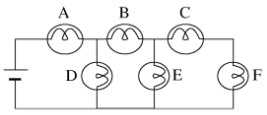
4. A parallel circuit has 4 resistors each on different paths connected to a 120 V potential difference.
   R1 = ___-___Ω R2 = ___-___Ω
   R3 = ___-___Ω R4 = ___-___Ω
Determine the equivalent resistance of the circuit?

5. The voltage drop for all 3 resistors shown in the circuit below is 60 V. *True or False*



Sem 2 Unit 11 Comparing Circuits

1. In the circuit shown below, which bulb, when burned out, will cause all other bulbs to stop glowing?

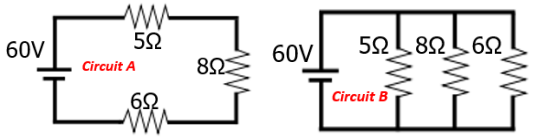


2. Most of the circuits in your home are _____.

3. A path that allows only one route for a current is called a _____.

4. In which circuit would a burned-out bulb cause all the other bulbs to go out?

5. Determine the total current for each circuit. ***Round to the nearest tenths.*** *Include the unit.*



Sem 2 Unit 12 Magnetic Field

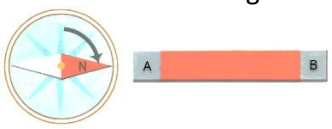
1. A compass needle is a small magnet mounted so that is free to turn. *True or False*

2. In permanent magnets, the domains point in random directions. *True or False*

3. The direction of the Earth's magnetic field is toward the _____.

4. Like poles attract each other. *True or False*

5. Which side is the magnetic north pole?



Sem 2 Unit 12 Electromagnets

1. A current-carrying conductor is kept at right angles to the direction of a magnetic field. What happens to the force acting on the wire if the strength of the magnetic field doubles?

2. A __-__**cm** length of wire carries a current perpendicular to a __-__T magnetic field. If the current in the wire is __-__, what will be the force on the wire?

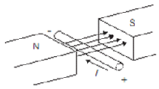
3. Current passing through a conductor is increased from 10 A to 15 A. This decreases the strength of the magnetic field produced by the conductor.

4. A__-__T magnetic field suspends a __-__m of copper wire with a current of __-__A in the air. What is the force on the wire?

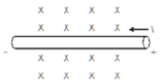
5. There are four coils of wire being used as electromagnets. They all have the same size and are made up of the same material but have a different number of loops. Which coil will produce a magnetic field with the maximum force when the same amount of current passes through all coils?
   a) A coil with 10 loops.
   b) A coil with 25 loops.
   c) A coil with 30 loops.
   d) A coil with 45 loop

Sem 2 Unit 12 Right Hand Rules

1. What is the direction of the force on the current carrying wire?

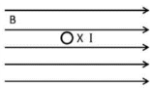


2. What is the direction of the force on the current carrying wire?



3. A horizontal wire carries a current straight toward you. From your point of view, the magnetic field caused by this current circles the wire in a clockwise direction. *True or False*

4. Below is an end view (cross-section) of a current carrying wire in a uniform magnetic field. Magnetic field and current directions are shown. What direction is the magnetic force?



5. The current in the conducting wire shown below must be to the right. *True or False*