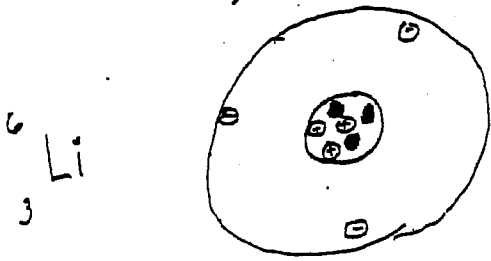


2nd section of COURSE
ELECTRICITY and MAGNETISM
(about 25% to 30% of course in 2 ½ Units)

- UNIT 8 - ELECTROSTATICS
 - UNIT 9 - CIRCUITS
 - UNIT 9a - MAGNETISM
-

UNIT 8 - ELECTROSTATICS

1) Know what the atom looks like, and how an object gets charged.

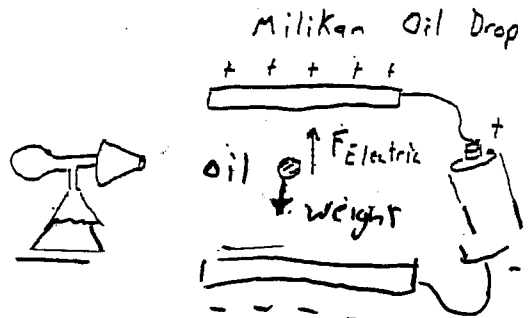


2) Know the charge on electron (unit charge, or elementary charge). Where is this in reference tables.

3) Be able to go from Coulombs to # of missing or extra electrons, OR # of electrons to Coulombs. (Know what is impossible)

electrons to Coulombs
 $\times (1.6 \times 10^{-19})$

Coulombs to # of electron
 $\div (1.6 \times 10^{-19} \text{ C})$

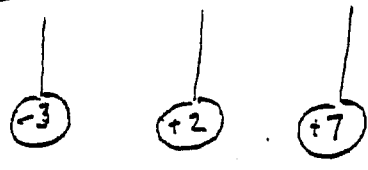


4) Balance of Charge principle. (Also called conservation of charge)

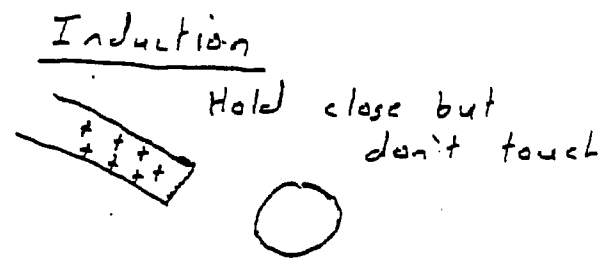
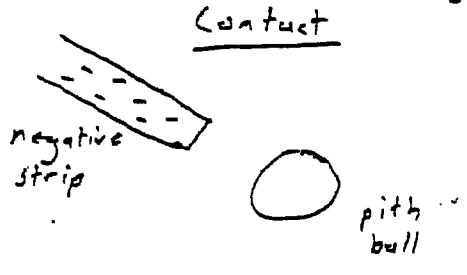
Just two



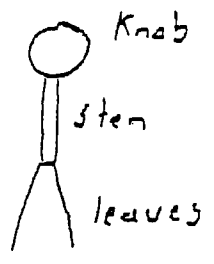
Could be more than two



5) Contact charging, and charging by Induction.

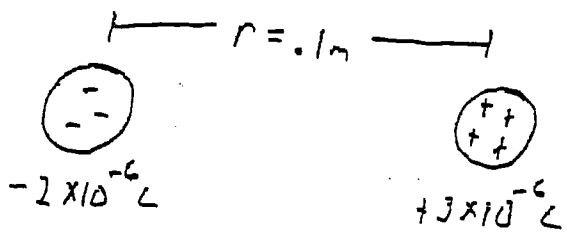


6) How does Electroscope work?



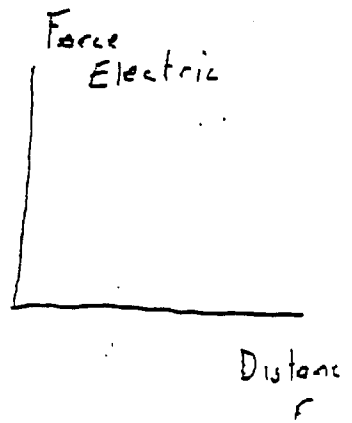
7) Coulomb's Law of Electrostatic Force -

(Know its an inversed squared law. What happens if - Distance doubles, Distance Triples, Distance cut to 1/3. One charge doubles, Both double)

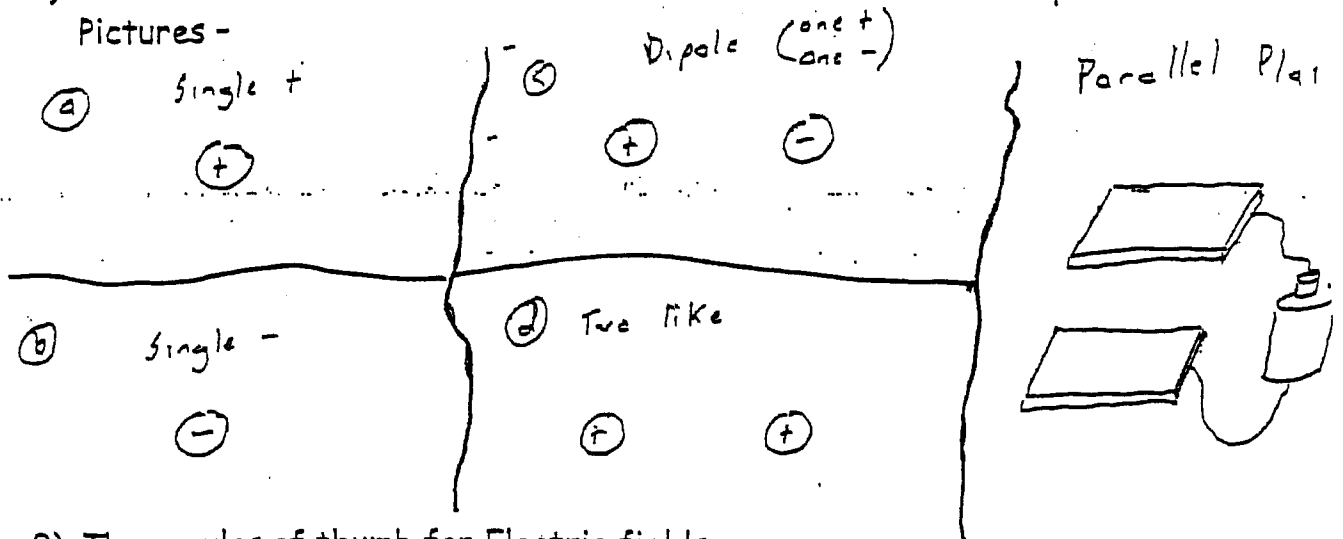


$$F = k \frac{Q_1 Q_2}{r^2}$$

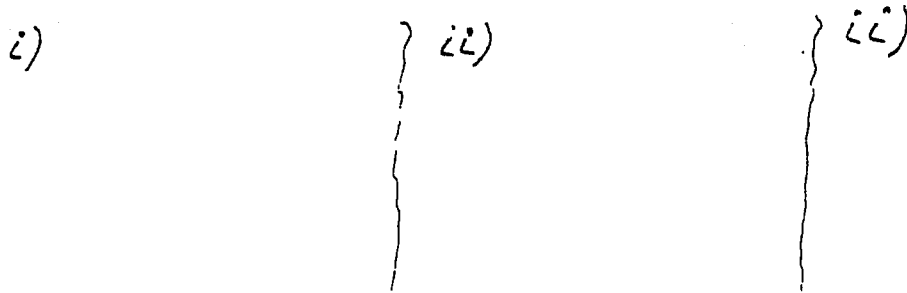
$$k = 9 \times 10^9 \frac{N \cdot m^2}{C^2}$$



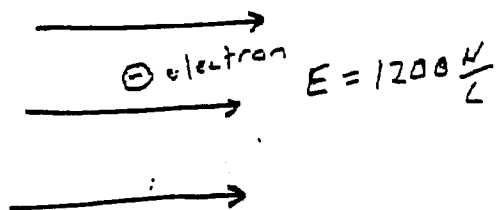
8) What is Electric Field. What are the 6 Basic Electric Field Maps or Pictures -



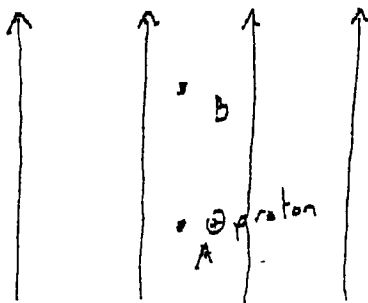
9) Three rules of thumb for Electric fields.



10) Electric field Definition equation



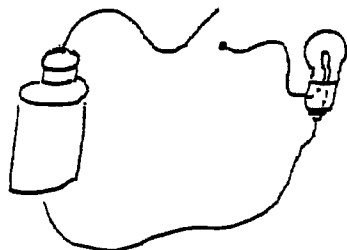
11) Voltage Definition Equation - (voltage is potential difference)



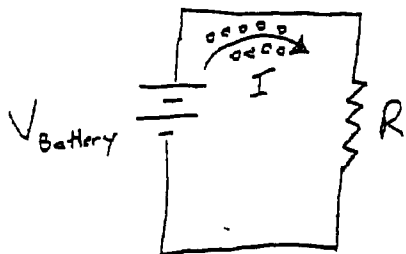
- proton moves from A to B through an E field, The Potential Diff. between A & B is 200 Volt.
 - find Energy gained.

UNIT 9 - CIRCUITS

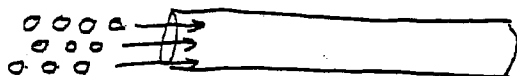
- 1) Basic idea of what a circuit is. How does a bulb work. Draw a schematic diagram of the circuit below. How does a switch work in a circuit. How does a fuse work.



- 2) Have an intuitive understanding of three working parts in a circuit. (Voltage, Current, Resistance). How do the three factors interact in a circuit. (This is Ohms' Law $V=IR$)

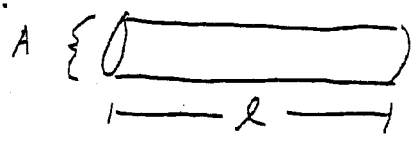


- 3) Current and current equation. What is an Amp of current flow -



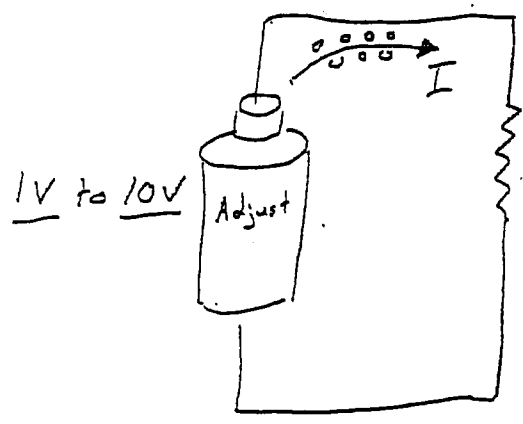
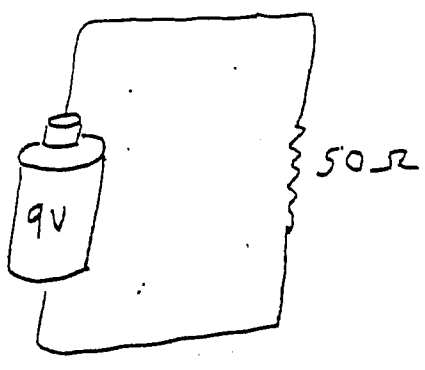
4) Resistance of a piece of wire (metallic conductor).

General Size and Shape

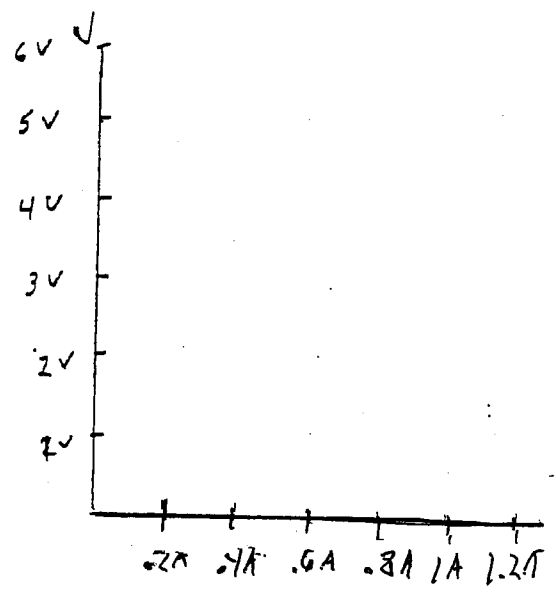


Exact Equation

5) Basic One Battery, One Resistor circuit. Do Ohms law to find V, I, or R. Could be adjustable battery and you draw a graph of Volts vs. Current. Hook up a voltmeter and ammeter in picture to measure Voltage drop in, or current flowing through the resistor.

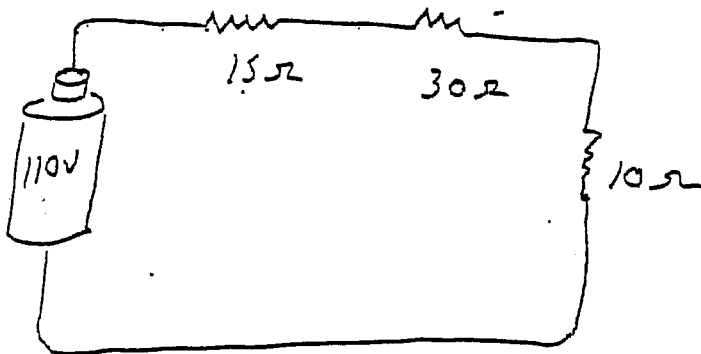


V	I
1V	.02A
2V	.035A
3V	.06A
4V	.085A
5V	.95A
6V	1.2A
7V	1.4A



6) Series Circuit -

RULES -



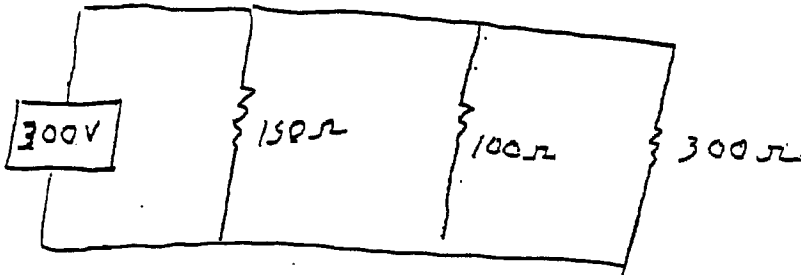
- Find I flowing in each resistor, and Voltage drop in each resistor, Doing total or Equivalent method.

- Find I flowing in each, and Voltage drop in each using individual Resistor method

7) Parallel Circuit -

FS 7

RULES -



- Find I flowing in each resistor, and Voltage drop in each resistor. Doing total or Equivalent method.

- Find I flowing in each, and Voltage drop in each using individual Resistor method

8) Power used up by resistors, or power supplied by battery.
(Watts or Joules/sec)

$$P = VI = I^2R = V^2/R$$

Watts
of
power

$$W = P(t) = VI(t) = I^2R(t)$$

Joules
of Energy

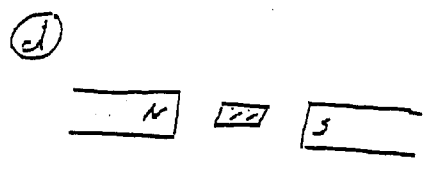
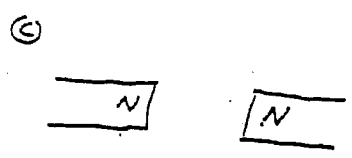
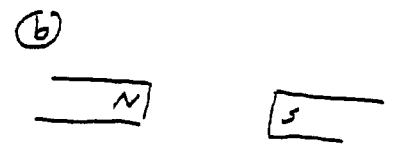
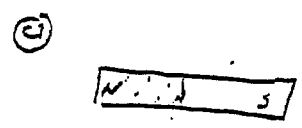
9) What type of circuits eat up the most Power ?

UNIT 9A - MAGNETISM

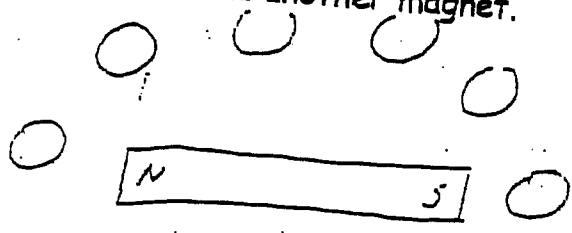
(This unit is very short)

1) What is the cause of all magnetism, On atomic level why are natural bar magnets magnetic ?

2) What does the magnetic force field map look like for -
What do these field lines indicate ?



3) Know how a compass needle is a little magnet in itself. How will it line up when placed around another magnet.



4) Since moving charge gives off magnetic field, What happens when we move a piece of wire past a magnet, (this is a generator).

