**Homework #9: Electronics menagerie 45 points**

*Chem 6614 Chemical Instrumentation Due Monday 5 May*

1. Which passive component(s) below do not produce a phase shift between alternating voltage and its alternating current ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Capacitor inductor resistor rheostat

1. **Match symbols and units**
2. Henries b) mho c)μA d) mW

e) uF f)J/coulomb g)MΩ h) coulombs

C\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q\_\_\_\_\_\_\_\_\_\_\_\_\_

I \_\_\_\_\_\_\_\_\_\_\_\_\_\_

V \_\_\_\_\_\_\_\_\_\_\_\_\_\_

R \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **A B C D**

L \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_









P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Match components to symbols**



Resistor \_\_\_\_

Capacitor \_\_\_\_ **E F**



Voltage monitor\_\_\_\_

Inductor \_\_\_\_



Op amp \_\_\_\_ **G H I**





Diode \_\_\_\_

Transformer \_\_\_\_

Transistor \_\_\_\_



AC source \_\_\_\_ **K** **L**



DC source \_\_\_\_



Current monitor\_\_\_\_

control chip \_\_\_\_



ground \_\_\_\_ **M N O**



LED \_\_\_\_

1. **Wheatstone Bridge Detection**



 R1 =100 ohms, R2 =300 ohms. If the galvanometer

(G) shows zero current (null) when Rs = R4 = 1500 ohms, what

Is the value of Rx = R3 ? Rx= \_\_\_\_\_\_\_\_\_\_\_ohms

1. **Component Uses**
2. Divides V and I; passive \_\_\_\_\_
3. Voltage lags current; blocks DC \_\_\_\_\_
4. Current lags voltage; blocks AC \_\_\_\_\_
5. Transistor
6. Inductor
7. Capacitor
8. Resistor
9. Diode
10. One-way electronic valve \_\_\_\_\_
11. Solid state switch \_\_\_\_\_

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**6. Sketchy Stuff (7 pts)**

For each component shown, sketch the expected time variation of the voltage or current

across the indicated component

**VA = applied voltage describe time effect**

 **On I or V in words below:**

 0 τ



 VR

(2 pts)

 I

 V(R)C



(3 pts)

 I



 VR(C)



 V(R)L

(2 pts)

 I( R) L

**7. Computer Speak (10012 points= 910 pts)**

1. What is meant by the term: “A 3 GHz machine” ?
2. What is meant by 4 Gb RAM ?
3. How is cache different than hard drive memory?
4. What is a `BUS’ ?

Match us:

1) (older style) 9 pin Serial port mostly for printers

2) modern serial connectors

3) Hard connection to Ethernet

4) MAC connector

5)(newer style) parallel port to peripherals

DB-25 \_\_\_\_\_

USB \_\_\_\_\_

RJ-45 \_\_\_\_\_

RS-232 \_\_\_\_\_

DIN-8 \_\_\_\_