

## Blitz, Ch 9, Form M-R

Name \_\_\_\_\_ Period \_\_\_\_\_

***This is a Take Home Exam. You may use your Notes, PowerPoint, or Text on this exam but NO help from human beings!***

**EXPLAIN IN COMPLETE SENTENCES AND GIVE EXAMPLES:**

**You MUST HAND WRITE THIS EXAM!! NO TYPED PAPERS WILL BE ACCEPTED!**

1. Explain what capillarity is, and state the four laws of capillarity.
2. Calculate the lifting force in newtons of a hydrogen-filled zeppelin whose volume is 10,000 cubic meters.
3. Define: element, compound, atom, molecule, atomic mass, atomic mass number, isotope and give an example of each.
4. Find the pressure in  $\text{kg/m}^2$  on the bottom of a brick whose dimensions are 20 X 40 cm by 10 cm high. Its mass is 5.0 kg.

\*\*\* SHOW METHOD OF SOLUTION FOR ALL PROBLEMS (The 1,2,3,4!)

5. State Pascal's Law and discuss an important application of it.
6. If a hydraulic piston is 2.0 cm in diameter and has a force of 10.0 n applied to it, find the diameter of the load piston that will support a car weighing 10,000 n.
7. Determine the density of a ball that masses 220.0 g in air and 155.0 g under water.
8. Find the number of kilograms to pull apart evacuated Magdeburg Hemispheres whose radii are 25.0 cm when the barometer reads 760 mm of Hg.
9. An aluminum wire 65.0 cm long and 0.30 cm in radius is suspended. A 42.0 kg mass is attached to the end. Find the stress. Remember that force is in newtons.
10. A spring is stretched by a force of 0.80 n a distance of 0.012 m. Find how far it will stretch when the force is 0.54 n.

FORMULAS: For a spring:  $F = k\Delta d$  ... stress =  $F/A$  ... strain =  $\Delta l/l$  ...  $Y = \text{stress/strain}$  ...

$$Y_{\text{Au}} = 7.85 \times 10^{10} \text{ n/m}^2 \dots Y_{\text{Al}} = 6.96 \times 10^{10} \text{ n/m}^2 \dots Y_{\text{Cu}} = 11.6 \times 10^{10} \text{ n/m}^2$$

$$P = f/A \dots TF = PA \dots P_{\text{atm}} = 10 \text{ m H}_2\text{O} \dots P_{\text{atm}} = 760 \text{ mm Hg} \dots P_{\text{atm}} = 1 \text{ kg/cm}^2$$

**When finished, please STAPLE this exam onto your papers and turn in on due date.**