PLANT SCIENCE

Section 2.1

Questions

2.1-1. Name the three states of matter.

a. SOLIDS

b. LIQUIDS

c. GASES

2.1-2. The state, or phase, of matter of a particular substance is strongly influenced by two conditions. Name them.

a. TEMPERATURES

b. PRESSURES

2.1-3. Match each term in Column "A" with the correct description from Column "B". Write the correct number in each blank.

a.	2 Solid	(1)	Has no definite volume or shape
b.	3 Liquid	(2)	Has a definite shape and volume
c.	1 Gas	(3)	Has a definite volume, but no definite shape

2.1-4. Atoms are made up of three types of particles. Name them.

a. PROTONS

b. NEUTRONS

c. ELECTRONS

2.1-5. True or False. A molecule is the smallest particle of matter that retains all the properties of a particular substance.

PLANT SCIENCE

Section 2.2

Question

2.2-1. The molecules of a solid are packed closely together because solids have strong _____ forces.
(adhesive, cohesive)

2.2-2. Define temperature.
AVERAGE MOLECULAR KINETIC ENERGY OF A SUBSTANCE

2.2-3. True or False. The measurement of mass is typically expressed in units of weight.

2.2-4. The amount of space that matter occupies is referred to as VOLUME.

2.2-5. Define density.
MASS PER UNIT VOLUME
WT. DENSITY = $\frac{\text{WEIGHT}}{\text{VOLUME}}$

2.2-6. ELASTICITY is the tendency of solids to return to their original shape after being deformed by stress.

2.2-7. List the five basic types of stress.

a. TENSION
b. COMPRESSION
c. BENDING
d. TWISTING
e. SHEARING

2.2.8. What is elastic limit.
THE POINT AT WHICH THE FORCE APPLIED TO A SOLID EXCEEDS THE ABILITY TO RETURN TO IT ORIGINAL SHAPE

Section 2.3

Questions

2.3-1. True or False. The free movement of liquid molecules allows liquids to flow.

2.3-2. Define viscosity.

A LIQUID RESISTANCE TO FLOW

2.3-3. If a liquid is poured out of a container, some of the liquid clings to the walls of the container because of the _____ forces that exist between the molecules of the walls of the container and the molecules of the liquid.
(cohesive, adhesive)

2.3-4. True or False. Capillary action is a result of cohesive forces.

2.3-5. Circle the correct answer.

An object that floats displaces an amount of liquid that is _____ the weight of the object.

a. Greater than
b. Less than
c. Equal to

BUOYANCY

2.3-6. Define specific gravity.

THE WEIGHT OF A VOLUME OF SUBSTANCE DIVIDED BY THE SAME VOLUME OF WATER

2.3-7. True or False. The temperature of a liquid is a result of molecular weight and varies with the depth of the liquid.

2.3-8. Pascal's law state that PRESSURE applied to a confined fluid is transmitted throughout the fluid and the walls of the confining vessel.

PLANT SCIENCE

Section 2.4

Questions

2.4-1. If there is an increase in molecular movement in a contained gas, the increase in collisions between the gas molecules and the molecules of the container's wall will result in _____ pressure.
(higher, lower)

2.4-2. Boyle's Law states that at a given temperature, the pressure of gas varies inversely with its VOLUME.

2.4-3. ~~True~~ or False. According to Charles' Law, at a given pressure, if there is an increase in the temperature of a gas, there will also be an increase in the volume of the gas.

2.4-4. According to the General Gas Law, if a certain amount of gas is confined in a given volume, and the volume is decreased, both the pressure and the temperature will _____.
(decrease, increase)

$\frac{PV}{T}$ = CONSTANT

2.4-5. Air compressors usually have an air (a) COOLER because when air is compressed, its pressure and (b) TEMPERATURES increase.

14.7 = S. PRESSURE

68°F = S. TEMP.

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Section 2.5

Questions

2.5-1. True or False. Atmospheric pressure is the same everywhere.
MANOMETER

2.5-2. A BAROMETER is a device used to measure atmospheric pressure.

2.5-3. List three scales commonly used to measure pressure in a plant.

a. ABSOLUTE (PSIA)

b. VACUUM (PSIV)

c. GAUGE (PSIG)

2.5-6. Convert 5 psia to psiv. ATM PSIV
= 14.7 − 5 = 9.7 PSIV
9.7 PSIV

2.5-7. Put the following pressure measurements in order, from highest to lowest. Write a 1 in the blank next to the highest value, a 2 in the blank next to the second highest value, and a e in the blank next to the lowest value.

a. 10 psia 2 = 10

b. 10 psig 1 = 24.7

c. 10 psiv 3 = 4.7

1" MERCURY = .49PSI

Section 2.6

Questions

2.6-1 Flow occurs when a given amount of (a) FLUID moves past a (b) GIVEN POINT.

2.6-2. Define flow rate.
THE AMOUNT OF FLUID FLOWING PAST A GIVEN POINT PER UNIT TIME

2.6-3. When conditions at any point in a system remain constant with time, they are called STEADY-STATE conditions.

2.6-4. The pressure related to the height, or level, of liquid above a given point is called HEAD pressure.

2.6-5. (True) or False. Because friction is a force that opposes motion, friction in system causes pressure to be reduced.

$\dot{V}$
FLOW RATE = AREA X VELOCITY

1 FT. OF WATER = .433 PSI
(HEAD) (PRESSURE)

$H = h_p + h_v + h_f$