

AP Physics 2

Name: _____ Score: _____

1. In kinetic theory, the temperature of a gas is a measure of the particles':
 - ☐ average kinetic energy
 - ☐ colour
 - ☐ total number
 - ☐ total mass
2. A gas at 100 kPa, 2 m^3 is squeezed to 0.5 m^3 at constant temperature. What is the new pressure, in kPa?
_____ kPa
3. Left on their own, in which direction does heat flow?
 - ☐ in no particular direction
 - ☐ from cold to hot
 - ☐ always upward
 - ☐ from hot to cold
4. A gas absorbs 500 J of heat and does 200 J of work. What is its change in internal energy, in joules?
_____ J
5. How much heat warms 2 kg of water by 10°C ? ($c = 4200 \frac{\text{J}}{\text{kg}\cdot^\circ\text{C}}$.) Answer in J.
_____ J
6. Entropy is a measure of a system's:
 - ☐ total mass
 - ☐ temperature only
 - ☐ electric charge
 - ☐ disorder
7. What causes the pressure a gas exerts on its container?
 - ☐ the walls heating up
 - ☐ gravity pulling the gas down
 - ☐ particles colliding with the walls
 - ☐ the colour of the gas

8. Which is the ideal gas law?

☐ $V = IR$

☐ $P = mgh$

☐ $F = ma$

☐ $PV = nRT$

9. Thermal equilibrium means the two objects hold the same amount of internal energy.

☐ True ☐ False

10. A gas absorbs 400 J of heat but does no work (rigid container). What is ΔU , in joules?

_____ J

AP Physics 2

1. **average kinetic energy**

Temperature is proportional to the average kinetic energy of the particles.

2. **400 kPa**

$$P_1 V_1 = P_2 V_2 \Rightarrow 200 = 0.5 P_2 \Rightarrow P_2 = 400 \text{ kPa.}$$

3. **from hot to cold**

Heat flows spontaneously from the hotter object to the colder one.

4. **300 J**

$$\Delta U = Q - W = 500 - 200 = 300 \text{ J.}$$

5. **84000 J**

$$Q = mc\Delta T = 2 \times 4200 \times 10 = 84\,000 \text{ J.}$$

6. **disorder**

Entropy measures how spread-out and disordered a system's energy is.

7. **particles colliding with the walls**

Each collision with a wall gives a tiny push; together they make the pressure.

8. **$PV = nRT$**

$PV = nRT$ links pressure, volume, amount and temperature.

9. **False**

It means equal temperature, not equal energy – a large cool object can still hold more energy.

10. **400 J**

With $W = 0$, $\Delta U = Q = 400 \text{ J}$ – all the heat raises the internal energy.