

Fundamentals of Thermodynamics

Physics · Answer Key · 18 Questions

1. Which law of thermodynamics states that energy cannot be created or destroyed, only transformed?

A) First Law

B) Second Law

C) Third Law

D) Zeroth Law

2. What is the unit of measure for heat energy in the International System of Units (SI)?

A) Watt

B) Joule

C) Newton

D) Pascal

3. Which method of heat transfer occurs through the movement of fluids like liquids or gases?

A) Conduction

B) Radiation

C) Convection

D) Refraction

4. What is the temperature at which all molecular motion theoretically stops, known as absolute zero?

A) 0 degrees Celsius

B) 273 Kelvin

C) -273.15 degrees Celsius

D) 100 degrees Celsius

5. Which law of thermodynamics dictates that entropy in an isolated system always increases over time?

A) Zeroth Law

B) First Law

C) Second Law

D) Third Law

6. What type of heat transfer occurs through electromagnetic waves without the need for a medium?

- A) Conduction
- B) Radiation**
- C) Convection
- D) Diffusion

7. What device is used to measure the amount of heat released or absorbed during a chemical reaction?

- A) Barometer
- B) Thermometer
- C) Calorimeter**
- D) Hydrometer

8. Which process involves a substance changing from a solid directly to a gas without becoming a liquid?

- A) Evaporation
- B) Condensation
- C) Sublimation**
- D) Deposition

9. What physical property measures the average kinetic energy of the particles in a substance?

- A) Heat
- B) Temperature**
- C) Density
- D) Pressure

10. The Zeroth Law of Thermodynamics is fundamental to the definition of what concept?

- A) Work
- B) Pressure
- C) Temperature equilibrium**
- D) Entropy

11. Which material is generally considered a poor conductor of heat, also known as an insulator?

- A) Copper
- B) Aluminum
- C) Iron
- D) Wood**

12. What is the term for the amount of heat required to raise the temperature of one kilogram of a substance by one degree Celsius?

A) Latent heat

B) Specific heat capacity

C) Thermal expansion

D) Internal energy

13. In a thermodynamic system, what is defined as the product of force and displacement?

A) Work

B) Power

C) Entropy

D) Enthalpy

14. Which phase change occurs when a gas releases heat to become a liquid?

A) Vaporization

B) Condensation

C) Melting

D) Freezing

15. What happens to the volume of most substances when they are heated, a phenomenon known as thermal expansion?

A) It decreases

B) It stays the same

C) It increases

D) It fluctuates

16. Which state of matter has the highest average kinetic energy of its particles?

A) Solid

B) Liquid

C) Gas

D) Bose-Einstein condensate

17. What is the primary heat transfer mechanism in solids where energy is passed via particle collisions?

A) Conduction

B) Radiation

C) Convection

D) Evaporation

18. Which law of thermodynamics states that the entropy of a perfect crystal at absolute zero is zero?

- A) First Law
- B) Second Law
- C) Third Law**
- D) Zeroth Law