

Fundamentals of Thermodynamics

Thermodynamics · Answer Key · 20 Questions

1. Which of the following is a unit of temperature?

- A) Joule
- B) Watt
- C) Pascal
- D) Kelvin**

2. The first law of thermodynamics is a statement of the conservation of what?

- A) Mass
- B) Momentum
- C) Energy**
- D) Charge

3. Which process involves the transfer of heat through direct contact between particles?

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

4. Absolute zero is the theoretical temperature at which particle motion stops. What is its value in Celsius?

- A) 0°C
- B) 100°C
- C) -100°C
- D) -273.15°C**

5. What is the SI unit of heat energy?

- A) Calorie
- B) BTU
- C) Kilogram
- D) Joule**

6. The second law of thermodynamics states that the entropy of an isolated system tends to:

- A) Decrease
- B) Remain constant
- C) Increase**
- D) Become zero

7. Which of the following is a measure of the average kinetic energy of the particles in a substance?

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

8. Heat transfer through the movement of fluids (liquids or gases) is called:

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

9. A substance that readily transfers heat is known as a good:

- A) Insulator
- B) Conductor**
- C) Reflector
- D) Absorber

10. The process by which heat is transferred through electromagnetic waves is called:

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

11. What is the unit of power, often associated with the rate of energy transfer?

- A) Joule
- B) Newton
- C) Watt**
- D) Pascal

12. According to the Zeroth Law of Thermodynamics, if two systems are each in thermal equilibrium with a third system, then they are in thermal equilibrium with each other.

- A) True**
- B) False
- C) Sometimes
- D) Only at absolute zero

13. The capacity of a substance to absorb heat without changing its temperature is called its:

- A) Thermal conductivity
- B) Specific heat capacity**
- C) Latent heat
- D) Boiling point

14. Which state of matter typically has the highest thermal conductivity?

- A) Solid
- B) Liquid
- C) Gas
- D) Plasma**

15. The total energy of the particles within a system is known as:

- A) Kinetic energy
- B) Potential energy
- C) Internal energy**
- D) Mechanical energy

16. The amount of heat required to change the state of a substance (e.g., melting or boiling) at a constant temperature is called:

- A) Specific heat
- B) Thermal expansion
- C) Latent heat**
- D) Heat capacity

17. When a gas is compressed rapidly and adiabatically, its temperature tends to:

- A) Decrease
- B) Stay the same
- C) Increase**
- D) Become absolute zero

18. A perfect black body is an idealized object that absorbs all incident electromagnetic radiation and emits radiation based solely on its temperature.

- A) True**
- B) False
- C) Partially true
- D) Depends on color

19. What is the SI unit of pressure?

- A) Newton
- B) Joule
- C) Watt

D) Pascal

20. The third law of thermodynamics deals with the behavior of systems as they approach what temperature?

- A) Boiling point
- B) Room temperature

C) Absolute zero

D) Melting point