

Unit 01: Heat, Temperature, and Pressure

1. Which temperature is different from the other three?

- a. 15°C
- b. 59°F
- c. 475°K
- d. 519°R

ANSWER:

c

2. Which temperature is the warmest?

- a. 20°C
- b. 303 K
- c. 501°R
- d. 77°F

ANSWER:

b

3. Which definition best describes temperature?

- a. The amount of heat in a material
- b. The density of the material
- c. A description of the level of heat
- d. The weight of the total mass of the material

ANSWER:

c

4. At which temperature on the Celsius scale does water boil at standard conditions?

- a. 100°C
- b. 212°C
- c. 32°C
- d. 0°C

ANSWER:

a

5. At which barometric pressure does pure water boil at a temperature of 212°F?

- a. 12.696 psia
- b. 13.696 psia
- c. 14.696 psia
- d. 15.696 psia

ANSWER:

c

6. At which temperature on the Fahrenheit scale does all molecular motion stop?

- a. -450°F
- b. -460°F
- c. 0°F
- d. -462.95°F

ANSWER:

b

7. At which temperature on the Celsius scale does all molecular motion stop?

Unit 01: Heat, Temperature, and Pressure

- a. -273°C
- b. -293°C
- c. -460°C
- d. -459.6°C

ANSWER:

a

8. What happens to the molecules in a material as the temperature of a material increases?

- a. They stop moving.
- b. They travel faster.
- c. They slow down.
- d. They travel in more of a parallel direction.

ANSWER:

b

9. Which temperature is the Celsius equivalent of 80°F?

- a. 25.5°C
- b. 26.7°C
- c. 26.3°C
- d. 27.5°C

ANSWER:

b

10. How many Btus are required to change 1 pound of ice at 20°F to steam at 220°F?

- a. 1304 Btu
- b. 2608 Btu
- c. 6520 Btu
- d. 3912 Btu

ANSWER:

a

11. How many Btus are required to change 5 pounds of ice at 20°F to steam at 220°F?

- a. 1304 Btu
- b. 2608 Btu
- c. 6520 Btu
- d. 3912 Btu

ANSWER:

c

12. How many Btus must be removed from 1 pound of water at 200°F for it to end up as ice at 30°F?

- a. 144 Btu
- b. 828 Btu
- c. 313 Btu
- d. 526 Btu

ANSWER:

c

13. The amount of heat needed to change the temperature of a substance will vary with the type of substance. This heat quality is called the _____ heat of the substance.

Unit 01: Heat, Temperature, and Pressure

- a. sensible
- b. specific
- c. latent
- d. relative

ANSWER:

b

14. What is the standard atmospheric pressure at sea level?

- a. 29.60 in. Hg
- b. 29.71 in. Hg
- c. 29.83 in. Hg
- d. 29.92 in. Hg

ANSWER:

d

15. The unit psig measures the pounds per square inch of _____.

- a. gravity pressure
- b. gauge pressure
- c. pressure absolute
- d. gravity

ANSWER:

b

16. Which instrument often contains a Bourdon tube?

- a. Mercury barometer
- b. Aneroid barometer
- c. Pressure gauge
- d. Mercury thermometer

ANSWER:

c

17. Water boils at 212°C.

- a. True
- b. False

ANSWER:

False

18. Water at 0°F has no heat energy or molecular activity.

- a. True
- b. False

ANSWER:

False

19. The heat transfer rate between two substances is determined by the difference in their _____.

- a. temperature
- b. volume
- c. pressure
- d. melting point

ANSWER:

a

Unit 01: Heat, Temperature, and Pressure

20. Both sensible heat and latent heat transfers can be read with a thermometer.

- a. True
- b. False

ANSWER: False

21. In order for water at 60°F to boil, it must absorb both sensible and latent heat.

- a. True
- b. False

ANSWER: True

22. When water at 212°F boils, it is only absorbing latent heat.

- a. True
- b. False

ANSWER: True

23. Heat that changes the temperature of a substance is called _____ heat.

- a. specific
- b. sensible
- c. intense
- d. latent

ANSWER: b

24. In _____ heat, or hidden heat, heat is known to be added, but no temperature rise is noticed.

- a. specific
- b. sensible
- c. intense
- d. latent

ANSWER: d

25. Raising the vapor temperature above the boiling point is called _____.

- a. superheating
- b. vaporizing
- c. condensing
- d. saturating

ANSWER: a

26. Measured by a barometer, atmospheric pressure in inches of mercury (in. Hg) decreases _____ in. per 1000-foot increase in elevation.

- a. 1
- b. 10
- c. 100
- d. 1000

ANSWER: a

Unit 01: Heat, Temperature, and Pressure

27. A gauge that reads pressures above and below atmospheric pressure is known as a(n) _____ gauge.

- a. analog
- b. compound
- c. high-side
- d. low-side

ANSWER:

b

28. A Btu is defined as the amount of heat required to _____.

- a. raise the temperature of 1 lb of ice from 0°F to 32°F
- b. boil 1 lb of water at atmospheric conditions
- c. raise the temperature of 1 lb of water by 1°F
- d. melt 1 lb of ice in 1 hour

ANSWER:

c

29. The first law of thermodynamics states that energy _____.

- a. cannot be converted from one form to another
- b. can be either created or destroyed
- c. can be neither created nor destroyed
- d. can be created but not destroyed

ANSWER:

c

30. Which process best describes heat transfer by conduction?

- a. Energy is converted from one form to another.
- b. Energy travels through space without heating it.
- c. Fluid flow moves heat from one place to another.
- d. Energy travels from one molecule to another.

ANSWER:

d

31. In the heating and air-conditioning trades, air and water are the most common fluid mediums used to transfer heat through _____.

- a. radiation
- b. convection
- c. conduction
- d. absorption

ANSWER:

b

32. Which type of heat transfer can occur in a vacuum?

- a. radiation
- b. convection
- c. conduction
- d. absorption

ANSWER:

a

Unit 01: Heat, Temperature, and Pressure

33. The absolute pressure equals the gauge pressure _____.

- a. plus the atmospheric pressure
- b. minus the atmospheric pressure
- c. at absolute zero
- d. at 30°F

ANSWER:

a

34. An absolute pressure reading of 6 psia can be converted to _____ in. Hg.

- a. 6
- b. 12
- c. 18
- d. 30

ANSWER:

b

35. The unit in. Hg is a measure of _____.

- a. pounds per square inch of gauge pressure
- b. pressure difference above and below atmospheric pressure
- c. system pressure determined by gauge manifold
- d. the height of a column of mercury in a barometer

ANSWER:

d