

**[UKSSSC - JE (ME) THERMODYNAMIC]
[SET-1]**

1. Which of the following variables controls the physical properties of a perfect gas

- a) Pressure
- b) Temperature
- c) Volume
- d) All of the above

Ans: d)

2. Which of the following laws is applicable for the behavior of a perfect gas

- a) Boyle's law
- b) Charles' law
- c) Gay-Lussac law
- d) All of the above

Ans: d)

3. The unit of temperature in S.I. units is

- a) Centigrade
- b) Celsius
- c) Fahrenheit
- d) Kelvin

Ans: d)

4. The unit of mass in S.I. units is

- a) Kilogram
- b) Gram
- c) Tonne
- d) Quintal

Ans: a)

5. The unit of time in S.I. units is

- a) second
- b) minute
- c) hour
- d) day

Ans: a)

6. The unit of length in S.I. units is

- a) meter
- b) centimeter
- c) kilometer
- d) millimeter

Ans: a)

7. The unit of energy in S.I. units is

- a) watt
- b) joule
- c) joule/s
- d) joule/m

Ans: b)

8. According to Gay-Lussac law for a perfect gas, the absolute pressure of given mass varies directly as

- a) Temperature
- b) Absolute
- c) Absolute temperature, if volume is kept constant
- d) Volume, if temperature is kept constant

Ans: c)

9. An ideal gas compared to a real gas at very high pressure occupies

- a) more volume
- b) less volume
- c) same volume
- d) unpredictable behavior

Ans: a)

10. General gas equation is

- a) $PV = nRT$
- b) $PV = mRT$
- c) $PV = C$
- d) $PV = KiRT$

Ans: b)

11. According to Dalton's law, the total pressure of the mixture of gases is equal to

- a) greater of the partial pressures of all
- b) average of the partial pressures of all
- c) sum of the partial pressures of all
- d) sum of the partial pressures of all divided by average molecular weight

Ans: c)

12. Which of the following can be regarded as gas so that gas laws could be applicable, within the commonly encountered temperature limits.

- a) O_2 , N_2 , steam, CO_2
- b) SO_2 , NH_3 , CO_2 , moisture
- c) O_2 , N_2 , H_2 , air
- d) Steam vapours, H_2 , CO_2

Ans: c)

13. The unit of pressure in S.I. units is

- a) kg/cm^2
- b) mm of water column

- c) pascal
d) dynes per square cm
Ans: c)
14. A closed system is one in which
a) mass does not cross boundaries of the system, though energy may do so
b) mass crosses the boundary but not the energy
c) neither mass nor energy crosses the boundaries of the system
d) both energy and mass cross the boundaries of the system
Ans: a)
15. Temperature of a gas is produced due to
a) its heating value
b) kinetic energy of molecules
c) repulsion of molecules
d) attraction of molecules
Ans: b)
16. According to kinetic theory of gases, the absolute zero temperature is attained when
a) volume of the gas is zero
b) pressure of the gas is zero
c) kinetic energy of the molecules is zero
d) specific heat of gas is zero
Ans: c)
17. Kinetic theory of gases assumes that the collisions between the molecules are
a) perfectly elastic
b) perfectly inelastic
c) partly elastic
d) partly inelastic
Ans: a)
18. The pressure of a gas in terms of its kinetic energy per unit volume E is equal to
a) $E/3$ b) $E/2$
c) $3E/4$ d) $2E/3$
Ans: d)
19. Kinetic energy of the molecules in terms of absolute temperature (T) is proportional to
a) T b) T^2 c) T^3 d) \sqrt{T}
Ans: a)
20. Superheated vapour behaves
a) exactly as gas
b) as steam
c) as ordinary vapour
d) approximately as a gas
Ans: d)
21. Absolute zero pressure will occur
a) at sea level
b) at the centre of the earth
c) when molecular momentum of the system becomes zero
d) under vacuum conditions
Ans: c)
22. No liquid can exist as liquid at
a) -273°K
b) vacuum
c) zero pressure
d) centre of earth
Ans: c)
23. The unit of power in S.I. unit is
a) Newton b) Pascal
c) Erg d) Watt
Ans: d)
24. The condition of perfect vacuum, i.e., absolute pressure can be attained at
a) a temperature of -273.16°C
b) a temperature of 0°C
c) a temperature of 273°K
d) can't be attained
Ans: a)
25. Intensive property of system is one whose value
a) depends on the mass of the system, like volume

- b) does not depend on the mass of the system, like temperature, pressure, etc
- c) is not dependent on the path followed but on the state
- d) remains constant

Ans: b)

26. Specific heat of air at constant pressure is equal to

- a) 0.17
- b) 0.21
- c) 0.24
- d) 1.0

Ans: c)

27. Characteristic gas constant of a gas is equal to

- a) C/C_v
- b) C_v/C_p
- c) $C_p - C_v$
- d) $C_p + C_v$

Ans: c)

28. The behaviour of gases can be fully determined by

- a) 1 law
- b) 2 laws
- c) 3 law
- d) 4 laws

Ans: d)

29. The ratio of two specific heats of air is equal to

- a) 0.17
- b) 0.24
- c) 0.1
- d) 1.41

Ans: d)

30. Boyle's law i.e. $pV = \text{constant}$ is applicable to gases under

- a) all range of pressures
- b) only small range of pressures
- c) high range of pressures
- d) steady change of pressures

Ans: b)

31. Which law states that the internal energy of a gas is a function of temperature

- a) Charles' law
- b) Joule's law
- c) Regnault's law

d) Boyle's law

Ans: b)

32. The same volume of all gases would present their

- a) densities
- b) specific weights
- c) molecular weights
- d) gas characteristic constants

Ans: c)

33. Which law states that the specific heat of a gas remains constant at all temperatures and pressures

- a) Charles' Law
- b) Joule's Law
- c) Regnault's Law
- d) Boyle's Law

Ans: c)

34. An open system is one in which

- a) mass does not cross boundaries of the system, though energy may do so
- b) neither mass nor energy crosses the boundaries of the system
- c) both energy and mass cross the boundaries of the system
- d) mass crosses the boundary but not the energy

Ans: c)

35. According to which law, all perfect gases change in volume by $1/273$ th of their original volume at 0°C for every 1°C change in temperature when pressure remains constant

- a) Joule's law
- b) Boyle's law
- c) Regnault's law
- d) Charles law

Ans: d)

36. Gases have

- a) Only one value of specific heat
- b) Two values of specific heat
- c) Three values of specific heat

d) No value of specific heat
Ans: b)

37. According to Avogadro's Hypothesis

- a) The molecular weights of all the perfect gases occupy the same volume under same conditions of pressure and temperature
- b) The sum of partial pressure of mixture of two gases is sum of the two
- c) Product of the gas constant and the molecular weight of an ideal gas is constant
- d) Gases have two values of specific heat

Ans: a)

38. Extensive property of a system is one whose value

- a) depends on the mass of the system like volume
- b) does not depend on the mass of the system, like temperature, pressure, etc
- c) is not dependent on the path followed but on the state
- d) is dependent on the path followed and not on the state

Ans: a)

39. Work done in a free expansion process is

- a) +ve
- b) -ve
- c) zero
- d) maximum

Ans: c)

40. The statement that molecular weights of all gases occupy the same volume is known as

- a) Avogadro's hypothesis
- b) Dalton's law
- c) Gas law
- d) Law of thermodynamics

Ans: a)

41. To convert volumetric analysis to gravimetric analysis, the relative volume of each constituent of the flue gases is

- a) divided by its molecular weight

- b) multiple by its molecular weight
- c) multiple by its density
- d) multiple by its specific weight

Ans: b)

42. If a gas heated against a pressure, keeping the volume constant, then work done will be equal to

- a) +ve
- b) -ve
- c) Zero
- d) Pressure \times Volume

Ans: c)

43. An isolated system is one in which

- a) mass does not cross boundaries of the system, through energy may do so
- b) neither mass nor energy crosses the boundaries of the system
- c) both energy and mass cross the boundaries of the system
- d) mass crosses the boundary but not the energy

Ans: b)

44. Properties of substances like pressure, temperature and density, in thermodynamic coordinates are

- a) path functions
- b) point functions
- c) cyclic functions
- d) real functions

Ans: b)

45. Which of the following quantities is not the property of the system

- a) pressure
- b) temperature
- c) specific volume
- d) heat

Ans: d)

46. According to Avogadro's law, for a given pressure and temperature, each molecule of a gas

- a) occupies volume proportional to its molecular weight
- b) occupies volume proportional to its specific weight
- c) occupies volume inversely proportional to its molecular weight
- d) occupies same volume

Ans: d)

47. Mixture of ice and water form a

- a) closed system
- b) open system
- c) isolated system
- d) heterogeneous system

Ans: d)

48. Which of the following is the property of a system

- a) pressure and temperature
- b) internal energy
- c) volume and density
- d) all of the above

Ans: d)

49. On weight basis, air contains following parts of oxygen

- a) 21 b) 23
- c) 25 d) 73

Ans: b)

50. Which of the following is not the intensity property

- a) pressure
- b) temperature
- c) density
- d) heat

Ans: d)

