

**[UKSSSC - JE (ME) THERMODYNAMICS]
[SET-2]**

1. Which of the following item is not a path function

- a) heat
- b) work
- c) kinetic energy
- d) thermal conductivity

Ans: d)

2. Work done in an adiabatic process between a given pair of end states depends on

- a) the end states only
- b) particular adiabatic process
- c) the value of index n
- d) mass of the system

Ans: a)

3. Heat and work are

- a) point functions
- b) system properties
- c) path functions
- d) intensive properties

Ans: c)

4. Which of the following parameters is constant for a mole for most of the gases at a given temperature and pressure

- a) enthalpy
- b) volume
- c) mass
- d) specific volume

Ans: b)

5. The value of $n = 1$ in the polytropic process indicates it to be

- a) reversible process
- b) isothermal process
- c) adiabatic process
- d) irreversible process

Ans: b)

6. Solids and liquids have

- a) one value of specific heat (ft) two values of specific heat
- b) three values of specific heat
- c) no value of specific heat
- d) one value under some conditions and two values under other conditions

Ans: a)

7. A perfect gas at 27°C is heated at constant pressure till its volume is double. The final temperature is

- a) 54°C
- b) 327°C
- c) 108°C
- d) 654°C

Ans: b)

8. Curve A in Fig. 1.1 compared to curves B and C shows the following type of expansion

- a) throttling
- b) isothermal
- c) adiabatic
- d) free expansion

Ans: b)

9. If value of n is infinitely large in a polytropic process $pV^n = C$, then the process is known as constant

- a) volume
- b) pressure
- c) temperature
- d) entropy

Ans: a)

10. The index of compression n tends to reach ratio of specific heats γ when

- a) flow is uniform and steady
- b) process is isentropic
- c) process is isothermal
- d) process is isentropic and specific heat does not change with temperature
- e) change with temperature

Ans: d)

11. Change in enthalpy of a system is the heat supplied at

- a) constant pressure
- b) constant temperature
- c) constant volume
- d) constant entropy

Ans: a)

12. The term N.T.P. stands for

- a) nominal temperature and pressure
- b) natural temperature and pressure
- c) normal temperature and pressure
- d) normal thermodynamic practice

Ans: c)

13. A heat exchange process in which the product of pressure and volume remains constant is known as

- a) heat exchange process
- b) throttling process
- c) isentropic process
- d) hyperbolic process

Ans: d)

14. In an isothermal process, the internal energy of gas molecules

- a) increases
- b) decreases
- c) remains constant
- d) may increase/decrease depending on the properties of gas

Ans: c)

15. Zeroth law of thermodynamics

- a) deals with conversion of mass and energy
- b) deals with reversibility and irreversibility of process
- c) states that if two systems are both in equilibrium with a third system, they are in thermal equilibrium with each other
- d) deals with heat engines

Ans: c)

16. If a certain amount of dry ice is mixed with same amount of water at 80°C , the final temperature of mixture will be

- a) 80°C
- b) 0°C
- c) 40°C
- d) 20°C

Ans: b)

17. The basis for measuring thermodynamic property of temperature is given by

- a) zeroth law of thermodynamics
- b) first law of thermodynamics
- c) second law of thermodynamics
- d) third law of thermodynamics

Ans: a)

18. One watt is equal to

- a) 1 Nm/s
- b) 1 N/mt
- c) 1 Nm/hr
- d) 1 kNm/hr

Ans: a)

19. Work done is zero for the following process

- a) constant volume
- b) free expansion
- c) throttling
- d) all of the above

Ans: d)

20. For which of the following substances, the gas laws can be used with minimum error

- a) dry steam
- b) wet steam
- c) saturated steam
- d) superheated steam

Ans: d)

21. In a non-flow reversible process for which $p = (-3V + 15) \times 10^5 \text{ N/m}^2$, V , changes from 1 m to 2 m³. The work done will be about

- a) $100 \times 1005 \text{ joules}$
- b) $1 \times 105 \text{ joules}$
- c) $10 \times 105 \text{ joules}$
- d) $10 \times 105 \text{ kilojoules}$

Ans: c)

22. The value of the product of molecular weight and the gas characteristic constant for all gases in M.K.S. unit is

- a) $29.27 \text{ kgfm/mol}^{\circ}\text{K}$
- b) $8314 \text{ kgfm/mol}^{\circ}\text{K}$

- c) 848 kgfm/mol^{°K}
d) 427 kgfm/mol^{°K}

Ans: c)

23. On volume basis, air contains following parts of oxygen

- a) 21 b) 23 c) 25 d) 77

Ans: a)

24. Universal gas constant is defined as equal to product of the molecular weight of the gas and

- a) Specific heat at constant pressure
b) Specific heat at constant volume
c) Ratio of two specific heat
d) Gas constant

Ans: d)

25. The value of the product of molecular weight and the gas characteristic constant for all the gases in S.I. units is

- a) 29.27J/kmol^{°K}
b) 83.14 J/kmol^{°K}
c) 848 J/kmol^{°K}
d) All of these

Ans: b)

26. For which of the following substances, the internal energy and enthalpy are the functions of temperature only

- a) any gas
b) saturated steam
c) water
d) perfect gas

Ans: d)

27. In a free expansion process

- a) work done is zero
b) heat transfer is zero
c) both a) and b) above
d) none of these

Ans: c)

28. If a gas vapour is allowed to expand through a very minute aperture, then such a process is known as

- a) free expansion
b) hyperbolic expansion
c) parabolic expansion
d) throttling

Ans: d)

29. The specific heat of air increases in

- a) temperature
b) pressure
c) variation of its constants
d) air flow

Ans: a)

30. If a fluid expands suddenly into vacuum through an orifice of large dimension, then such a process is called

- a) free expansion
b) hyperbolic expansion
c) adiabatic expansion
d) parabolic expansion

Ans: a)

31. Which of the following process are thermodynamically reversible

- a) throttling
b) free expansion
c) hyperbolic and $pV = C$
d) isothermal and adiabatic

Ans: d)

32. Which of the following processes is irreversible process

- a) isothermal
b) adiabatic
c) throttling
d) none of these

Ans: c)

33. In order that a cycle be reversible, following must be satisfied

- a) free expansion or friction resisted expansion/compression process should not be encountered
b) when heat is being absorbed, temperature of hot source and working substance should be same
c) when heat is being rejected, temperature of cold source and working substance should be same
d) all of the above

Ans: d)

34. For a thermodynamic process to be reversible, the temperature difference between hot body and working substance should be

- a) zero b) minimum
c) maximum d) infinity

Ans: a)

35. Minimum work is compressor is possible when the value of adiabatic index n is equal to

- a) 0.75 b) 1
c) 1.27 d) 1.35

Ans: b)

36. Molecular volume of any perfect gas at $600 \times 10^3 \text{ N/m}^2$ and 27°C will be

- a) $4.17 \text{ m}^3/\text{kg mol}$
b) $400 \text{ m}^3/\text{kg mol}$
c) $0.15 \text{ m}^3/\text{kg mol}$
d) $41.7 \text{ m}^3/\text{kg mol}$

Ans: a)

37. A gas is compressed in a cylinder by a movable piston to a volume one-half its original volume. During the process 300 kJ heat left the gas and internal energy remained same. The work done on gas in Nm will be

- a) 300 Nm b) 300,000 Nm
c) 30 Nm d) 30 Nm

Ans: b)

38. The more effective way of increasing efficiency of Carnot engine is to

- a) Increase higher temperature
b) Decrease higher temperature
c) Increase lower temperature
d) Decrease lower temperature

Ans: d)

39. Entropy change depends on

- a) Heat transfer
b) Mass transfer
c) Change of transfer
d) Thermodynamic state

Ans: a)

40. For reversible adiabatic process, change in entropy is

- a) maximum b) minimum
c) zero d) unpredictable

Ans: c)

41. Isochoric process is one in which

- a) free expansion takes place
b) very little mechanical work is done by the system
c) no mechanical work is done by the system
d) all parameters remain constant

Ans: c)

42. According to first law of thermodynamics

- a) work done by a system is equal to heat transferred by the system
b) total internal energy of a system during a process remains constant
c) internal energy, enthalpy and entropy during a process remain constant
d) total energy of a system remains constant

Ans: d)

43. Energy can neither be created nor destroyed but can be converted from one form to other is inferred from

- a) zeroth law of thermodynamic
b) first law of thermodynamics
c) second law of thermodynamics
d) basic law of thermodynamics

Ans: b)

44. First law of thermodynamics furnishes the relationship between

- a) heat and work
- b) heat, work and properties of the system
- c) various properties of the system
- d) various thermodynamic process

Ans: b)

45. Change in enthalpy in a closed system is equal to heat transferred if the reversible process takes place to constant

- a) Pressure
- b) Temperature
- c) volume
- d) internal energy

Ans: a)

46. In an isothermal process, the internal energy

- a) increases
- b) decreases
- c) remains constant
- d) first increases and then decreases

Ans: c)

47. Change the internal energy in a closed system is equal to heat transferred if the reversible process takes place at constant

- a) pressure
- b) temperature
- c) volume
- d) internal energy

Ans: c)

48. According to first law of thermodynamics

- a) mass and energy are mutually convertible
- b) Carnot engine is most efficient
- c) heat and work are mutual convertible
- d) mass and light are mutually convertible

Ans: c)

49. Total heat of a substance is also known as

- a) internal energy
- b) entropy
- c) thermal capacity
- d) enthalpy

Ans: d)

50. First law of thermodynamics

- a) enables to determine change in internal energy of the system
- b) does not help to predict whether the system will or undergo a change
- c) does not enable to determine change in entropy
- d) all of the above

Ans: d)

