

**[UKSSSC - JE (ME) THERMODYNAMIC]
[SET- 3]**

1. Addition of heat at constant pressure to a gas results in

- a) raising its temperature
- b) raising its pressure
- c) raising its volume
- d) raising its temperature and doing external work

Ans: d)

2. Carnot cycle has maximum efficiency for

- a) reversible engine
- b) irreversible engine
- c) new engine
- d) petrol engine

Ans: a)

3. Measurement of temperature is based on

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

Ans: b)

4. Carnot cycle efficiency upon

- a) properties of the medium/substance used
- b) condition of engine
- c) working condition
- d) temperature range of operation

Ans: d)

5. Carnot cycle efficiency is maximum when

- a) initial temperature is 0°K
- b) final temperature is 0°K
- c) difference between initial and final temperature is 0°K
- d) final temperature is 0°C

Ans: b)

6. An engine operates between temperatures of 900°K and r^2 and another engine between T^2 and

400°K for both to do equal work, value of T^2 will be

- a) 650°K
- b) 600°K
- c) 625°K
- d) 700°K

Ans: a)

7. If a heat exchanged in a reversible manner, which of the following property of the working substance will change accordingly

- a) temperature
- b) enthalpy
- c) internal energy
- d) entropy

Ans: d)

8. If a system after undergoing a series of processes, returns to the initial state then

- a) process is thermodynamically in equilibrium
- b) process is executed in closed system cycle
- c) its entropy will change due to irreversibility
- d) sum of heat and work transfer will be zero

Ans: d)

9. Which of the following represents the perpetual motion of the first kind

- a) engine with 100% thermal efficiency
- b) a fully reversible engine
- c) transfer of heat energy from low temperature source to high temperature source
- d) a machine that continuously creates its own energy

Ans: _)

10. An actual engine is to be designed having same efficiency as the Carnot cycle. Such a proposition is

- a) feasible
- b) impossible
- c) possible

d) possible, but with lot of sophistication
Ans: d)

11. A manufacture claims to have a heat engine capable of developing 20 h.p. by receiving heat input of 400 kcal.mt and working between the temperature limits of 227°C and 27°C. His claim is

- a) justified
- b) not possible
- c) may be possible with lot of sophistications
- d) cost will be very high

Ans: b)

12. In a Carnot cycle, heat is transferred at

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

Ans: c)

13. A diathermic wall is one which

- a) prevents thermal interaction
- b) permits thermal interaction
- c) encourage thermal interaction
- d) discourage thermal interaction

Ans: b)

14. An adiabatic wall is one which

- a) prevents thermal interaction
- b) permits thermal interaction
- c) encourages thermal interaction
- d) discourage thermal interaction

Ans: a)

15. The door of a running refrigerator inside a room was left open. Which of the following statements is correct?

- a) The room will be cooled to the temperature inside the refrigerator
- b) The room will be cooled very slightly
- c) The room will be gradually warmed up

d) The temperature of the air in room will remain unaffected

Ans: c)

16. Compressed air coming out from a punctured football

- a) becomes hotter
- b) becomes cooler
- c) remains at the same temperature
- d) may become hotter or cooler depending upon the humidity of the surrounding air

Ans: b)

17. Water contained in a breaker can be made to boil by passing steam through it

- a) at atmospheric pressure
- b) at a pressure below the firusphejric pressure
- c) at a pressure greater than atmospheric pressure
- d) any pressure

Ans: c)

18. During throttling process

- a) heat exchange does not take place
- b) no work is done by expanding steam
- c) there is no change of internal energy of steam
- d) all of the above

Ans: d)

19. The energy of molecular motion appears as

- a) heat
- b) potential energy
- c) surface tension
- d) friction

Ans: a)

20. A sudden fall in the barometer reading is a sing of approaching

- a) fine weather
- b) rains
- c) storm
- d) cold wave

Ans: c)

21. The unit's universal gas constant is

- a) watts/ $^{\circ}$ K
- b) dynes/ $^{\circ}$ C
- c) ergscm/ $^{\circ}$ K
- d) erg/ $^{\circ}$ K

Ans: d)

22. Calorie is a measure of

- a) specific heat
- b) quantity of heat
- c) thermal capacity
- d) entropy

Ans: b)

23. 1 kgf/cm² is equal to

- a) 760 mm Hg
- b) Zero mm Hg
- c) 735.6 mm Hg
- d) 1 mm Hg

Ans: c)

24. Barometric pressure is equal to

- a) 760 mm Hg
- b) Zero mm Hg
- c) 735.6 mm Hg
- d) 1 mm Hg

Ans: a)

25. One barometric pressure or 1 atmospheric pressure is equal to

- a) 1 kgf/cm²
- b) 1.033 kgf/cm²
- c) 0 kgf/cm²
- d) 1.0197 kgf/cm²

Ans: b)

26. The first law of thermodynamics is the law of

- a) conservation of mass
- b) conservation of energy
- c) conservation of momentum
- d) conservation of heat

Ans: b)

27. A perpetual motion machine is

- a) a thermodynamic machine
- b) a non-thermodynamic machine
- c) a hypothetical machine
- d) a hypothetical machine whose operation would violate the laws of thermodynamics

Ans: d)

28. Kelvin Planck's law deals with

- a) conservation of heat
- b) conservation of work
- c) conservation of heat into work
- d) conservation of work into heat

Ans: c)

29. According to Clausius statement of second law of thermodynamics

- a) heat can't be transferred from low temperature source to high temperature source
- b) heat can be transferred from low temperature to high temperature to high temperature source by using refrigeration cycle
- c) heat can be transferred from low temperature to high temperature source if COP of process is more than unity
- d) heat can't be transferred from low temperature to high temperature source without the aid of external energy

Ans: d)

30. Thermal power plant works on

- a) Carnot cycle
- b) Joule cycle
- c) Rankine cycle
- d) Otto cycle

Ans: c)

31. Which of the following is an irreversible cycle

- a) Carnot

- b) Stirling
- c) Ericsson
- d) None of the above

Ans: d)

32. Otto cycle consists of the following four processes

- a) two isothermals and two isentropics
- b) two isentropics and two constant volumes
- c) two isentropics and two constant pressures
- d) none of the above

Ans: b)

33. The efficiency of a Carnot engine depends on

- a) working substance
- b) design of engine
- c) size of engine
- d) temperature of source and sink

Ans: d)

34. For same compression ratio and for same heat added

- a) Otto cycle is more efficient than Diesel cycle
- b) Diesel cycle is more efficient than Otto cycle
- c) Efficiency depends on other factors
- d) None of the above

Ans: a)

35. The efficiency of Carnot cycle is maximum for

- a) Gas engine
- b) Well lubricated engine
- c) Petrol engine
- d) Reversible engine

Ans: d)

36. Carnot cycle is

- a) a reversible cycle (ft) an irreversible engine
- b) a semi-reversible cycle

- c) a quasi static cycle
- d) an adiabatic irreversible cycle

Ans: a)

37. Diesel cycle consists of following four processes

- a) two isothermals and two isentropics
- b) two isentropics, and two constant volumes
- c) two isentropics, one constant volume and one constant pressure
- d) none of the above

Ans: c)

38. If both Stirling and Carnot cycles operate within the same temperature limits, then efficiency of Stirling cycle as compared to Carnot cycle

- a) more
- b) less
- c) equal
- d) none of the above

Ans: c)

39. Stirling and Ericsson cycles are

- a) reversible cycles
- b) irreversible cycles
- c) quasi- static cycles
- d) semi-reversible cycles

Ans: a)

40. A cycle consisting of two adiabatics and two constant pressure processes is known as

- a) Otto cycle
- b) Ericsson cycle
- c) Joule cycle
- d) Stirling cycle

Ans: c)

41. Reversed joule cycle is called

- a) Carnot cycle
- b) Rankine cycle
- c) Brayton cycle
- d) Bell Coleman cycle

Ans: c)

42. Brayton cycle consists of following four processes

- a) two isothermals and two isentropics
- b) two isentropics and two constant volumes
- c) two isentropics, one constant volume and one constant pressure
- d) two isentropics and two constant pressures

Ans: d)

43. Which of the following cycles is not a reversible cycle

- a) Carnot
- b) Ericsson
- c) Stirling
- d) None of the above

Ans: d)

44. The cycle in which heat is supplied at constant volume and rejected at constant pressure is known as

- a) Dual combustion cycle
- b) Diesel cycle
- c) Atkinson cycle
- d) Rankine cycle

Ans: c)

45. The efficiency of Diesel cycle with decrease in cut off

- a) Increases
- b) Decreases
- c) Remains unaffected
- d) None of the above

Ans: a)

46. Which of the following cycles has maximum efficiency

- a) Rankine
- b) Stirling
- c) Carnot
- d) Brayton

Ans: c)

47. The ideal efficiency of a Brayton cycle with regeneration, with increase in pressure ratio will

- a) increase
- b) decrease
- c) remain unchanged
- d) increase/decrease depending on application

Ans: b)

48. The following cycle is used for air craft refrigeration

- a) Brayton cycle
- b) Joule cycle
- c) Carnot cycle
- d) Reversed-Brayton cycle.

Ans: d)

149. Gas turbine cycle consists of

- a) two isothermals and two isentropics
- b) two isentropics and two constant volumes
- c) two isentropics, one constant volume and one constant pressure
- d) two isentropics and two constant pressures

Ans: a)

50. The thermodynamic difference between a Rankine cycle working with saturated steam and the Carnot cycle is that

- a) Carnot cycle can't work with saturated steam
- b) Heat is supplied to water at temperature below the maximum temperature of the cycle
- c) A Rankine cycle receives heat at two places
- d) Rankine cycle is hypothetical

Ans: b)