Exam-1 [Thermodynamics] NEET

(System, Properties, Process, FLOT)

Q1. Identify the intensive property from the following:

(a) volume
(b) mass
(c) enthalpy
(d) temperature

Q2. Which one of the following is an extensive property?

(a) Enthalpy
(b) Concentration
(c) Density
(d) Viscosity

Q3. For an adiabatic process, which of the following relations is correct?

(a) $\Delta E = 0$
(b) $\Delta PV = 0$
(c) $q = 0$
(d) $q = w$

Q4. What happens when methane undergoes combustion in systems A and B respectively?

System A: Adiabatic container
System B: Diathermic container

(a) System A – Temperature rises; System B – Temperature remains same
(b) System A – Temperature remains same; System B – Temperature rises
(c) System A – Temperature falls; System B – Temperature remains same
(d) System A – Temperature falls; System B – Temperature rises

Q5. Three moles of an ideal gas expanded spontaneously into vacuum. The work done will be

(a) Infinite
(b) 3 J
(c) 9 J
(d) zero

Q6. Which of the following is not a thermodynamic property of a system?

(a) H
(b) P
(c) E
(d) w

Q7. Maximum work can a gas do, if it is allowed to expand isothermally against

(a) vacuum
(b) high pressure of surrounding
(c) low pressure of surrounding
(d) atmospheric pressure

Q8. The internal energy change when a system goes from state A to B is 40 kJ/mol. If the system goes from A to B by a reversible path and returns to state A by an irreversible path, what would be the net change in internal energy?

(a) 40 kJ
(b) >40 kJ
(c) <40 kJ
(d) zero

Q9. Which of the following pair does show the extensive properties?

(a) temperature and pressure
(b) viscosity and surface tension
(c) refractive index and specific heat
(d) volume and heat capacity

Q10. A system absorbs 20 kJ heat and does 10 kJ of work. The internal energy of the system

(a) increases by 10 kJ
(b) decreases by 10 kJ
(c) increases by 30 kJ
(d) decreases by 30 kJ

Q11. The volume of a system becomes twice its original volume on the absorption of 300 cal of heat. The work done on the surrounding was found to be 200 cal. What is ΔU for the system?

(a) 500 cal
(b) 300 cal
(c) 100 cal
(d) –500 cal

Q12. One mole of an ideal gas at 300 K is expanded isothermally from an initial volume of 1 L to 10 L. The change in internal energy, ΔU, for the gas in this process is

(a) 163.7 cal
(b) zero
(c) 138.1 cal
(d) 9 L-atm

Q13. Choose the correct answer – A thermodynamic state function is a quantity:

(a) used to determine heat changes
(b) whose value is independent of path
(c) used to determine pressure-volume work
(d) whose value depends on temperature only

Q14. What is ΔE for system that does 500 cal of work on surrounding and 300 cal of heat is absorbed by the system?

(a) –200 cal
(b) –300 cal
(c) +200 cal
(d) +300 cal

Q15. Among the following the path variable is

(a) Internal energy (U)
(b) Volume (V)
(c) Heat (q)

(d) Enthalpy (H)

Q16. A system does 200 J of work and at the same time absorbs 150 J of heat. The magnitude of the change in internal energy is . . . J.

(a) 15
(b) 350
(c) 50
(d) 35.0

Q17. 1 L of an ideal gas is allowed to expand isothermally into vacuum until the total volume is 20 L. The amount of heat absorbed in this expansion is . . . L atm.

(a) 0
(b) 19
(c) 20
(d) 18

Q18. One mole of a gas absorbs 300 J of heat at constant volume and its temperature is raised from 30°C to 35°C. The value of ΔE is

(a) 300 J
(b) 0.1 J
(c) 150 J
(d) 200 J

Q19. Assertion (A): A process is called adiabatic if the system does not exchange heat with the surroundings.
Reason (R): It does not involve increase or decrease in temperature of the system.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false
(d) A is false but R is true

Q20. Which of the following statements is correct?

(a) The presence of reacting species in a covered beaker is an example of open system.
(b) There is an exchange of energy as well as matter between the system and the surroundings in a closed system.
(c) The presence of reactants in a closed vessel made up of copper is an example of a closed system.
(d) The presence of reactants in a thermos flask or any other closed insulated vessel is an example of a closed system.

Q21. In an adiabatic process, no transfer of heat takes place between system and surroundings. Choose the correct option for free expansion of an ideal gas under adiabatic condition from the following

(a) $q = 0, w \neq 0, \Delta T = 0$
(b) $q = 0, w = 0, \Delta T \neq 0$
(c) $q = 0, w = 0, \Delta T = 0$
(d) $q = 0, w \neq 0, \Delta T < 0$

Q22. When the system does not exchange heat with the surroundings, the process is

(a) isothermal
(b) adiabatic
(c) thermal
(d) isochoric