



Exam-2 [Thermodynamics] NEET

(System, Properties, Process, FLOT, Heat capacity)

- Q1.** In which one of the following sets, all the properties belong to same category (all extensive or all intensive)?
- (a) Mass, volume, pressure
 - (b) Temperature, pressure, volume
 - (c) Heat capacity, density, entropy
 - (d) Enthalpy, internal energy, volume
- Q2.** Freezing up liquid in a system then:
- (a) $q = 0$
 - (b) $q > 0$
 - (c) $q < 0$
 - (d) $q > 0$ or $q < 0$ (depending on the nature of liquid)
- Q3.** A thermodynamic system goes from states (i) P_1, V to $2P_1, V$ (ii) P, V_1 to $P, 2V_1$. Then work done in the two cases is
- (a) Zero, Zero
 - (b) Zero, $-PV_1$
 - (c) $-PV_1$, Zero
 - (d) $-PV_1$, $-P_1V_1$
- Q4.** Two moles of an ideal gas expand spontaneously into vacuum. The work done is
- (a) Zero
 - (b) 2 J
 - (c) 4 J
 - (d) 8 J
- Q5.** One mole of a gas occupying 3 dm^3 expands against a constant external pressure of 1 atm to a volume of 13 L. The work-done is:
- (a) -10 atm dm^3
 - (b) -20 atm dm^3
 - (c) -39 atm dm^3
 - (d) -48 atm dm^3
- Q6.** According to first law of thermodynamics (where q = heat supplied to system and W = work done by the system):
- (a) $\Delta U = q - W$
 - (b) $\Delta U = q + W$
 - (c) $\Delta U = \Delta q + \Delta W$
 - (d) $\Delta U = q + \Delta W$
- Q7.** A system absorbs 600 J of heat and work equivalent to 300 J on its surroundings. The change in internal energy is
- (a) 300 J
 - (b) 400 J

- (c) 500 J
- (d) 600 J

Q8. A system undergoes a process which absorbed 0.5 kJ of heat and undergoing an expansion against external pressure of 1 atm, during the process change in internal energy is 300 J. Then predict the change in volume (lit.).

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Q9. If work done by the system is 300 J when 100 cal heat is supplied to it. The change in internal energy during the process is:

- (a) -200 J
- (b) 400 J
- (c) 720 J
- (d) 120 J

Q10. One mole of a gas absorbs 200 J of heat at constant volume. Its temperature rises from 298 K to 308 K. The change in internal energy is:

- (a) 200 J
- (b) -200 J
- (c) $\frac{308}{298} \times 200$ J
- (d) $\frac{398}{308} \times 200$ J

Q11. A system has internal energy equal to U_1 J, 450 J of heat is taken out of it and 600 J of work is done on it. The final energy of the system will be:

- (a) $U_1 + 150$
- (b) $U_1 + 1050$
- (c) $U_1 - 150$
- (d) $U_1 - 250$

Q12. For the isothermal expansion of an ideal gas

- (a) U and H increases
- (b) U increases but H decreases
- (c) H increases but U decreases
- (d) U and H are unaltered

Q13. In an isochoric process the increase in internal energy is

- (a) Equal to the heat absorbed
- (b) Equal to the heat evolved
- (c) Equal to the work done
- (d) Equal to the sum of the heat absorbed and work done

Q14. In an isothermal expansion of an ideal gas. Select wrong statement.

- (a) There is no change in the temperature of the gas
- (b) There is no change in the internal energy of the gas
- (c) The work done by the gas is equal to the heat supplied to the gas
- (d) The work done by the gas is equal to the change in its internal energy

Q15. For an adiabatic process which of the following relations must be correct:

- (a) $\Delta U = 0$

(b) $\Delta PV = 0$

(c) $q = 0$

(d) $q = W$

Q16. The temperature of an ideal gas increases in an:

(a) adiabatic compression

(b) adiabatic expansion

(c) isothermal expansion

(d) isothermal compression

Q17. Which one of the following equations does not correctly represent the first law of thermodynamics for the given processes involving an ideal gas? (Assume non-expansion work is zero)

(a) Cyclic process: $\Delta U = -w$

(b) Cyclic process: $q = -w$

(c) Isochoric process: $q = \Delta U$

(d) Isothermal process: $q = -w$

Q18. During compression of a spring the work done is 10 kJ and 2 kJ escaped to the surroundings as heat. The change in internal energy, ΔU (in kJ) is:

(a) 8

(b) -8

(c) 12

(d) -12

Q19. An ideal gas is allowed to expand from 1 L to 10 L against a constant external pressure of 1 bar. The work done in kJ is:

(a) -9.0

(b) -0.9

(c) -2.0

(d) +10.0

Q20. Thermodynamics is not concerned about ...

(a) energy changes involved in a chemical reaction

(b) the extent to which a chemical reaction proceeds

(c) the rate at which a reaction proceeds

(d) the feasibility of chemical reaction

Q21. The state of a gas can be described by quoting the relationship between ...

(a) pressure, volume, temperature

(b) temperature, amount, pressure

(c) amount, volume, temperature

(d) pressure, volume, temperature, amount

Q22. Assertion: Mass and volume are extensive properties.

Reason: Mass/volume is also an extensive parameter.

(a) Both Assertion and Reason are correct and Reason is a correct explanation of the Assertion

(b) Both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion

(c) Assertion is correct but Reason is incorrect

(d) Both the Assertion and Reason are incorrect