St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 2nd

Solution of Work Sheet – 39

Class – XI | Subject – Physics | Date – 06.02.21

Chapter – Thermodynamics

Choose the correct option for the following questions. $1 \times 15 = 15$

1. If ΔU represents the increase in internal energy and W the work done by the system, which of the following is correct?
   a. $\Delta U = -W$ is an isothermal process
   b. $\Delta U = W$ is an isothermal process
   c. $\Delta U = -W$ is an adiabatic process
   d. $\Delta U = W$ is an adiabatic process
2. The specific heat of a gas in an isothermal process is
   a. Infinite b.zero c. negative d.remains constant
3. Initial pressure and volume of a gas is P and V respectively. It is expanded isothermally to a volume 4V and then its volume is made V by adiabatic process. Its final pressure is ($\gamma = 1.5$)
   a. 8P b. 4P c. 2P d. P
4. During adiabatic expansion of 2mole of a gas, the internal energy is found to decrease by 2J. The work done by the gas during the process is
   a. -2J b. -1J c. 2J d. 1J
5. The ratio of slopes of P-V graphs of adiabatic and isothermal process is
   a. γ b. $\frac{1}{\gamma}$ c. $1+\gamma$ d. $1-\gamma$
6. A gas expands from $2m^3$ to $6m^3$ at constant pressure 10 Pa. and then at constant volume the pressure is changed from 10Pa to 20Pa. the total work done by the gas is
   a. 40J b. 100J c. 60J d. 240J
7. 1mole of an ideal gas at initial temp TK does 6R joules work adiabatically. If $\gamma = \frac{5}{3}$, then final temp of the gas will be
   a. T – 4 K b. T+4 K c. T – 2.4 K d. T+2.4 K.
8. 10 moles of an ideal gas at constant temp 500K is compressed from 50lit to 5lit. work done in the process is
   a. -1.2×10^4 b. -2.4×10^4 c. -4.8×10^4 d. -9.4×10^4
9. The height of a waterfall is 50m. if $g=9.8 m/s^2$, the difference between the temp at the top and the bottom of the waterfall is
   a. 1.17℃ b. 2.17℃ c. 0.117℃ d. 1.43℃
10. An ideal gas is compressed isothermally until its pressure becomes double and then allowed to expand adiabatically to regain its original volume ($\gamma = 1.4$). the ratio of the final to initial pressure is
    a. 0.76:1 b. 1:1 c. 0.66:1 d. 0.86:1
11. Starting with the same initial conditions, an ideal gas expands from volume V to v in three different ways, the work done by the gas is x, y and z respectively for the process to be isothermal, isochoric and adiabatic. Then
    a. y>x>z b. y>z>x c. x>y>z d. x>z>y
12. Air in a cylinder is suddenly compressed by a piston which is then maintained at the same position. After some time, the
    a. Pressure will increase
    b. Pressure will decrease

c. Remains same
d. Becomes zero

13. The internal energy of a gas during isothermal expansion
    a. Increases
    b. Decreases
    c. Becomes zero
    d. Remains constant
14. When a gas expands adiabatically
    a. Law of conservation does not hold
    b. Internal energy of the gas is used in doing work
    c. No energy is required for expansion .
    d. None
15. In an adiabatic process, the quantity which remains constant is
    a. Volume
    b. Pressure
    c. Temperature
    d. Total energy of the system

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