

JEE Advanced Questions Based on Most Repeated Concepts of Thermodynamics

Q: A thermally insulating cylinder has a thermally insulating and frictionless movable partition in the middle, as shown in the figure below. On each side of the partition, there is one mole of an ideal gas, with specific heat at constant volume, $C_V = 2R$. Here, R is the gas constant. Initially, each side has a volume V_0 and temperature T_0 . The left side has an electric heater, which is turned on at very low power to transfer heat Q to the gas on the left side. As a result the partition moves slowly towards the right, reducing the right side volume to $V_0/2$. Consequently, the gas temperatures on the left and the right sides become T_L and T_R , respectively. Ignore the changes in the temperatures of the cylinder, heater and partition

Q: Four molecules of a diatomic gas are heated from 0°C to 50°C . Find the heat supplied to the gas if work done by it is zero.

Q: A thermally insulated vessel contains 150 g of water at 0°C . Then the air from the vessel is pumped out adiabatically. A fraction of water turns into ice and the rest evaporates at 0°C itself. The mass of evaporated water will be close to (Latent heat of vaporization of water = 2.10×10^6 J/kg and latent heat of fusion of water = 3.36×10^5 J/kg)

Q: A gas is undergoing change in state by an isothermal process AB as follows. Work done by gas in process AB is

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Q: A gas is compressed from a volume of 2m^3 to a volume of 1m^3 at a constant pressure of 100 N/m^2 . Then it is heated at constant volume by supplying 150 J of energy. As a result, the internal energy of the gas:

Q: During the melting of a slab of ice at 273 K at atmospheric pressure

- (a) positive work is done by the ice water system on the atmosphere.
- (b) positive work is done by the ice water system by the atmosphere.

- (c) the internal energy of the ice-water system increases.
- (d) the internal energy of the ice-water system decreases.