

JEE MAIN 1 FEBRUARY 2024 SHIFT 1 QUESTION PAPER

PHYSICS

- 2 moles of a monoatomic gas and 6 moles of a diatomic gas are mixed. Find the molar-specific heat for a constant volume of the mixture if R represents the universal gas constant.
- A gas undergoes a thermodynamic process from state (P_1, V_1, T_1) to state (P_2, V_2, T_2) . If for the given process $PV^{3/2} = \text{constant}$, find the work done by the gas.
- A vernier calliper has 10 main scale divisions coinciding with 11 vernier scale divisions equals 5 mm. What is the least count of the device?
- De Broglie wavelength of a proton is λ and that of an α particle is 2λ . Find the ratio of the velocity of the proton to that of α particle.
- Determine the lowest energy of a photon emitted in the Balmer Series of a hydrogen atom.
- If a bullet of mass 10^{-2} kg and velocity 200 m/s gets embedded inside the bob of mass 1 kg of a simple pendulum, then what will be the maximum height that the system rises by in cm?
- On increasing temperature, the elasticity of a material will:
 - Increase
 - Decrease
 - Remain constant
 - May increase or decrease
- The length of a seconds pendulum, if it is placed at height $2R$ (where $R =$ the radius of the earth) from the surface of the earth, is $[10/x\pi^2]$ m. Find x .
- Two particles, each of mass 2 kg are placed in the $x - y$ plane such that m_x is 4 m on the negative x -axis and m_y is 4 m on the positive y -axis. If the distance of the centre of mass from the origin is $[(4\sqrt{2})/x]$, find x .
- What are the dimensions of an angular impulse?