

**PRESIDENCY UNIVERSITY, KOLKATA**

**DEPARTMENT OF PHYSICS**

**UG ADMISSION TEST 2012**

**MODEL QUESTIONS**

An ideal gas is initially at temperature 'T' and volume V. If the temperature is increased by  $\Delta T$ , pressure remaining unaltered, then  $(\Delta V / V \Delta T)$  varies as

- (a)  $1/T$     (b)  $T^2$     (c)  $T$     (d)  $T^{-2}$

A bomb thrown upwards explodes into fragments at the highest point. The centre of mass of the fragments will be

- a) at rest always (b) initially at rest and then will move in a parabolic path (c) initially at rest and then will move in any direction, (d) initially at rest and then will move vertically downwards.

Imagine yourself sitting within a large air-filled glass sphere completely submerged within clear water and parallel rays of light strike the sphere. What would you see?

- (a) Parallel rays (b) Virtual image of distant object. (c) Rays appearing to come from the apex of a cone. (d) Rays appearing to converge into the apex of a cone.

The distance between the plates of a parallel-plate capacitor is increased in two situations:

(1) by connecting a battery across them and

(2) after disconnecting the battery.

The energy stored in the capacitor will

- (a) decrease in(1) and increase in (2), (b) increase in (1) and decrease in(2), (c) remains unchanged in both the cases, (d) increases in both the cases

According to Bohr's theory the ratio of the velocity of the electron in the first Bohr orbit of Hydrogen to the velocity of light in vacuum is approximately

- (a)  $1/37$     (b)  $1/100$     (c)  $1/137$     (d) none of these

The ratio of the energy of a Hydrogen atom in the ground state to that of a triply ionized

- Be ( $z=4$ ) atom with the same orbital radii is    (a) 1:1    (b) 1:2    (c) 1:4    (d) 4:1