

## IIT-JEE 2007

## PHYSICS

### PART -2

**1 Solution : (B)**

**2 Solution : (A)**

for  $a < x < 2a$  path will be concave upward

$2a < x < 3a$  path will be concave downward

**3 Solution : (D)**

$$\frac{1}{2}mv^2 + \frac{1}{2}I_{cm}\left(\frac{V}{R}\right)^2 = mg\left(\frac{3v^2}{4g}\right)$$

$$\text{Hence } I_{cm} = \frac{1}{2}mR^2$$

**4 Solution : (A)**

$$\lambda = \frac{h}{\sqrt{2m(eV)}} \Rightarrow eV = \frac{h^2}{2m\lambda^2}$$

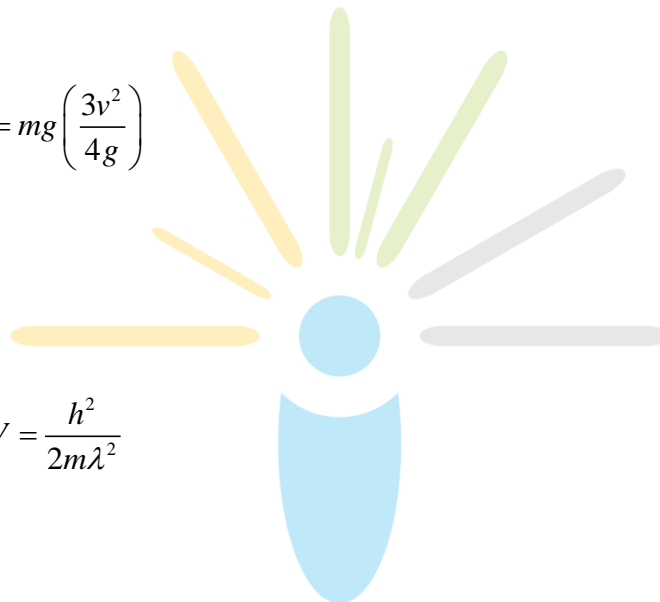
$$\lambda_0 = \frac{hC}{eV}$$

**5 Solution : (B)**

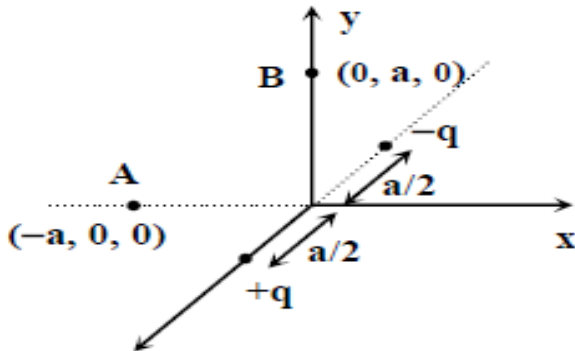
$$Y = \frac{4F\ell}{\pi d^2 \Delta \ell}$$

$$\frac{\Delta Y}{Y} \frac{2\Delta D}{D} \frac{\Delta(L)}{\Delta L} = 0.1125$$

$$\Delta Y = 2 \times 10^{11} \times 0.1125$$



6 Solution : (C)

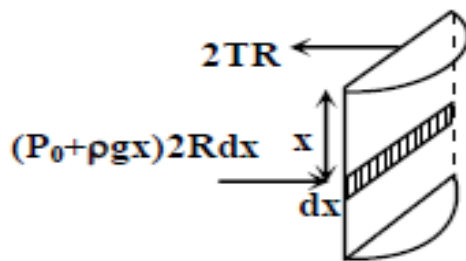
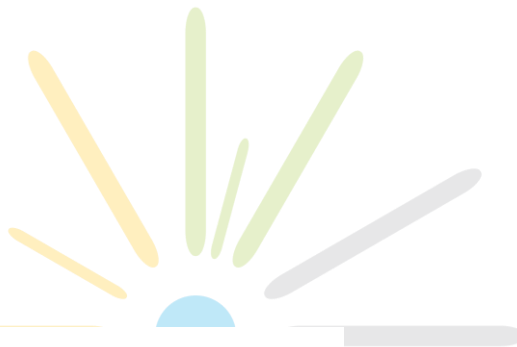


7 Solution : (A)

8 Solution : (B)

$$\int_0^h (P_0 + \rho gx) 2R dx - 2RT = F$$

$$2P_0Rh + R\rho gh^2 - 2RT = F$$



9 Solution : (D)

$$\vec{F} = \frac{d\vec{P}}{dt}(t) = AK[-\hat{i} \sin(kt) - \hat{j} \cos(kt)]$$

$$\vec{F} \cdot \vec{P} = 0$$

**SECTION – II**  
**Assertion - Reason Type**

**10 Solution : (A)**

**11 Solution : (D)**

**12 Solution : (B)**

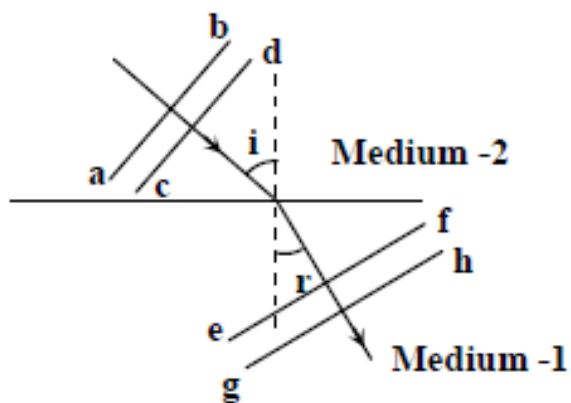
**13 Solution : (B)**

**SECTION – III**

**Linked Comprehension Type**

**P14 – 16 : Paragraph for Question Nos. 14 to 16**

**14 Solution : (A)**



**15 Solution : (C)**

**16 Solution : (B)**

**P17 – 19 : Paragraph for Question Nos. 17 to 19**

**17 Solution :** (B)

Speed of sound is frame dependent.

**18 Solution :** (A)

**19 Solution :** (A)

**SECTION -IV**

**Matrix-Match Type**

**20 Solution :**  $A \rightarrow (p)$ ,  $B \rightarrow (q) \ \& \ (r)$ ,  $C \rightarrow (p)$ ,  $D \rightarrow (r) \ \& \ (q)$

**21 Solution :**  $A \rightarrow (q) \ \& \ (r)$ ,  $B \rightarrow (p)$ ,  $C \rightarrow (q) \ \& \ (r)$ ,  $D \rightarrow (q)$

**22 Solution :**  $A \rightarrow (s)$ ,  $B \rightarrow (q)$ ,  $C \rightarrow (p)$ ,  $D \rightarrow (r)$