Solutions to Disc ② 2nd Appn

SHM ②

Page ②

i) $T = 2\pi\sqrt{\frac{2mR^2}{mgR}} = 2\pi\sqrt{\frac{2R}{g}}$

(ii) $T = 2\pi\sqrt{\frac{5mb^2\sqrt{3}}{12mgb}} = 2\pi\sqrt{\frac{5b\sqrt{3}}{12g}}$

2) $d_1 d_2 = k_G^2 = \frac{3R}{4} \times d_2 = \frac{R}{2} \Rightarrow d_2 = \frac{2R}{3}$.

$AB = \frac{3R}{4} - \frac{2R}{3} = \frac{R}{12}$.

3) $T_{Min} = 2\pi\sqrt{\frac{2l}{g\sqrt{12}}} = 2\pi\sqrt{\frac{l}{g\sqrt{3}}}$

$AC = \frac{l}{2} - \frac{l}{2\sqrt{3}}$.

Solution 28th April DPP-3

3 (i) $T = 2\pi R\sqrt{\frac{3m}{2k}} = 2\pi\frac{R}{R}\sqrt{\frac{3m}{4k}} = 2\pi\sqrt{\frac{3m}{2k}}$

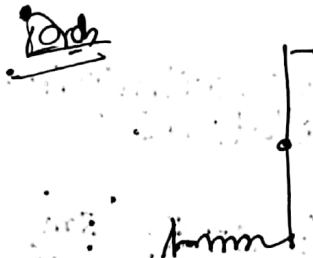
(ii) $= 2\pi \cdot \frac{R}{2R}\sqrt{\frac{3m}{2k}} = \pi\sqrt{\frac{3m}{2k}}$

4) $T = 2\pi\sqrt{\frac{I_{avg}}{k}} = \frac{2\pi\times 4}{3A}\sqrt{\frac{mL^2}{3\cdot k}}$

$\frac{8\pi}{3}\sqrt{\frac{m}{3k}}$

Solutions 28th April DIS (4)

Prob



$$T = 2\pi\sqrt{\frac{I_G}{kd^2 + kd^2}}$$

$$= 2\pi\sqrt{\frac{mk^2}{2kd^2}}$$

$$= 2\pi\sqrt{\frac{m}{6k}}$$

$$f_{nat} = \frac{1}{2\pi}\sqrt{\frac{6k}{m}}$$ //

(5) a) $k_{eq} = 4k\cos^2 30 = 3k$

$$T = 2\pi\sqrt{\frac{m}{3k}}$$

b) $k_{eq} = 4k\cos^2 45 = 2k$

$$T = 2\pi\sqrt{\frac{m}{2k}}$$ //

Solutions 28th April DKL · (5)

(6). $T = 2\pi\sqrt{\frac{m + \frac{3m}{3}}{k}} = 2\pi\sqrt{\frac{2m}{k}}$

$v_{max} = A\frac{2\pi}{T} = A \cdot \sqrt{\frac{k}{2m}}$

$KE_{max} = \frac{1}{2} m v_{m}^2 + \frac{1}{2}\frac{3m}{3} v_m^2$

$= m \cdot A^2 \frac{k}{2m} = \frac{1}{2} kA^2$

Amplitude of B = $\frac{1}{3\times 2} \times A = A/6$?

Solution Disc ⑥ 28th Apr

Amplitude ① = $A_0/6$

Amplitude ② = $\frac{A_0}{2}$

⑧ Amplitude B = $\frac{KA}{6K} = A/6$

$\frac{KA}{4K} = A/4$

Solutions 28th April SHM DPP (7)

$x = 1 \times \sin \frac{2\pi}{8} t$

$x = \sin \frac{\pi}{4} t$

$v = \frac{\pi}{4} \cos \frac{\pi}{4} t$

$a = -\frac{\pi^2}{16} \sin \frac{\pi}{4} t$

Substitute 't'

Scanned with CamScanner

Solutions of Assn SHM ② DMC-8

① $\frac{1}{2} m\omega^2 (A^2 - x^2) = \frac{1}{4} m\omega^2 x^2$

$x = \frac{A}{\sqrt{2}}$

②

$e^{-0.1t}$

$\downarrow$ τ

$\therefore \tau = 10$ seconds.

$\therefore T_{\frac{1}{2}} = 0.693 \times \tau$

$= 6.93$ sec

$\simeq 7$ seconds