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CLASS 9

CHAPTER - 1 NUMERICALS EXERCISE 1(S)

1. no. of oscillations = 40

time = 1 minute = 60 s

(i) frequency = $\frac{\text{no. of oscillations}}{\text{time}}$

$= \frac{40}{60}$

$= 0.67\ s^{-1}$

$= 0.67$ hertz. (Ans)

(ii) time period = $\frac{1}{\text{frequency}}$

$= \frac{1}{40/60}$

$= \frac{60}{40}$

$= 1.5$ s (Ans)

Q2. time period T = 2 s

(i) $f = \frac{1}{T}$

$= \frac{1}{2}$

$= 0.5$ hertz. (Ans)

(ii) seconds pendulum $\because$ T = 2 s. (Ans)

Q4 $T = 2\,s$

$g = 10\,ms^{-2}$ $\qquad \pi = 3.14$

$$l = \frac{T^2 g}{4\pi^2}$$

$$= \frac{(2)^2 \times 10}{4 \times (3.14)^2}$$

$$= \frac{10}{3.14 \times 3.14}$$

$$= 1.0142\ m \quad (Ans)$$

Q5 $T_1 : T_2$

$$2\pi\sqrt{\frac{l_1}{g}} : 2\pi\sqrt{\frac{l_2}{g}}$$

$$\sqrt{l_1} : \sqrt{l_2}$$

$$\sqrt{1} : \sqrt{9}$$

$$1 : 3$$

$\therefore T_1 : T_2 = 1 : 3$ (Ans)

l_1 = length of first pendulum

l_2 = length of second pendulum

T_1 = Time period of first pendulum

T_2 = Time period of second pendulum

Q6 Time taken for 2 oscillations = 5 s

Time taken for 1 oscillation = $\frac{5}{2}$ = 2.5 second

$\therefore T = 2.5 \text{ s}$

$g = 9.8 \text{ m s}^{-2}$

$$l = \frac{T^2 g}{4\pi^2}$$

$$= \frac{(2.5)^2 \times 9.8}{4 \times (3.14)^2}$$

$$= \frac{6.25 \times 9.8}{4 \times 3.14 \times 3.14}$$

$$= 1.55 \text{ m (Ans)}$$

Q7 Let the ratio of the lengths be

$$l_1 : l_2$$

$$\frac{T_1^2 g}{4\pi^2} : \frac{T_2^2 g}{4\pi^2}$$

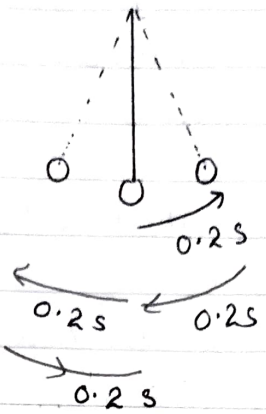
$$T_1^2 : T_2^2$$

$$(2)^2 : (1)^2$$

$$4 : 1$$

$\therefore l_1 : l_2 = 4 : 1$ (Ans)

Q8 Time period of the pendulum = 0.2 X 4
= 0.8 s



Q9.

Time period of a second's pendulum
= 2 second.

4 parts = 2 second
1 part = $\frac{2}{4}$ = 0.5 second

∴ time taken by second's pendulum to move from one extreme to other extreme = 0.5 X 2
= 1 second. (Ans)