# LGS GROUP OF COLLEGES

A PROJECT OF LAHORE GRAMMAR SCHOOL

Name: Kiswa Abdul Rauf Class: 1st Year (A) Roll No: _____

Subject: Physics Test No: WK-8 Date: 13-11-24

| | A | B | C | D | | A | B | C | D | | A | B | C | D | | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ○ | ○ | ○ | ○ | 6 | ○ | ○ | ○ | ○ | 11 | ○ | ○ | ○ | ○ | 16 | ○ | ○ | ○ | ○ |
| 2 | ○ | ○ | ○ | ○ | 7 | ○ | ○ | ○ | ○ | 12 | ○ | ○ | ○ | ○ | 17 | ○ | ○ | ○ | ○ |
| 3 | ○ | ○ | ○ | ○ | 8 | ○ | ○ | ○ | ○ | 13 | ○ | ○ | ○ | ○ | 18 | ○ | ○ | ○ | ○ |
| 4 | ○ | ○ | ○ | ○ | 9 | ○ | ○ | ○ | ○ | 14 | ○ | ○ | ○ | ○ | 19 | ○ | ○ | ○ | ○ |
| 5 | ○ | ○ | ○ | ○ | 10 | ○ | ○ | ○ | ○ | 15 | ○ | ○ | ○ | ○ | 20 | ○ | ○ | ○ | ○ |

Marks Obtained

## Assigment #02:-

## Physics:-

## Subjective Type:-

## Answer the Question:-

### (i)

### Speed of Sphere:-

P.E at the top = P.E at bottom

$$mgh = \frac{7}{10}mv^2$$

$$\therefore 10gh = 7v^2$$

$$10gh = 7v^2$$

$$\frac{10}{7}gh = v^2$$

Root

Taking Square on b.S,

$$\sqrt{v^2} = \sqrt{\frac{10}{7}gh}$$

$$\boxed{v = \sqrt{\frac{10}{7}gh}}$$

∴ Hence, proved

(2)

## Critical Velocity:-

$v = \sqrt{gR}$ ... $g = 9.8 \times 10\ ms^{-2}$ ... $R = 6400\ kms^{-1}$

$v = 7.9\ kms^{-1}$

(3)

## Weight of a person:-

As we know,

$\because T = ma$ ... (i)

$T = N + ma$

As given is statement.

$a = g$

$\therefore T = N + mg$

$\therefore N = mg$

$T = Mg + N$

$T = 2N$

(4)

## Numerical:-

Given,

Speed = velocity = $7.91\ kms^{-1}$

Radius = $R = 6400\ Km$

$T = 2\pi\sqrt{\frac{r^3}{GM}}$

$T = 2(3.14)\sqrt{\frac{(6400)^3}{(9.8 \times 10^{-3})(6.5 \times 10^{24})}}$

$T = 37.7\ days$

(5)

## Orbital Radius:-

$v = \sqrt{\frac{GM}{r}}$

$\because v = \frac{s}{t} = \frac{2\pi r}{t}$

$\frac{2\pi r}{t} = \sqrt{\frac{GM}{r}}$

Squaring b/s,

$\frac{4\pi^2 r^2}{t^2} = \frac{GM}{r}$

$r^3 = \frac{GMt^2}{4\pi^2}$

$r = \left(\frac{GMt^2}{4\pi^2}\right)^{1/3}$

(6)

## Numerical:-

Given,

diameter = $S = 2.5\ cm$

Angle = $\theta = 6.6 \times 10^{-9}$

distance = ?

$$S = r\theta$$

$$\frac{S}{\theta} = r$$

$$r = \frac{S}{\theta}$$

$$r = \frac{2.50\,m}{6.6 \times 10^{-9}}$$

$$\boxed{r = 3.78 \times 10^{-9}}$$

## (7) Numerical 1.

Given:

Distance b/w (Earth & moon) $= r_o = 3.85 \times 10^6 m$

Radius of moon $= r_s = 1.74 \times 10^6 m$

$$\frac{L_s}{L_o} = ?$$

$$\frac{L_s}{L_o} = \frac{I_s \omega_s}{I_o \omega_o}$$

$$\omega_s = \omega_o = \omega$$

$$I_s = \frac{2}{5} m r_s^2$$

$$I_o = m r_o^2$$

$$\frac{L_s}{L_o} = \frac{I_s \omega_s}{I_o \omega_o} = \frac{\frac{2}{5} m r_s^2 \omega}{m r_o^2 \omega}$$

$$\frac{L_s}{L_o} = \frac{2 r_s^2}{5 r_o^2} = \frac{2(1.74 \times 10^6)^2}{5(3.85 \times 10^6)^2}$$

$$= 8.17 \times 10^{-6}$$

$$\boxed{\frac{L_s}{L_o} = 8.2 \times 10^{-6}}$$