Sheet # _____

LGS GROUP OF COLLEGES
A PROJECT OF LAHORE GRAMMAR SCHOOL

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Physics Assignment

(Q2)
Critical Velocity

According to this formula:

$V = \sqrt{gR}$ we can find the value

$V = ?$ $g = 9.8 ms^{-1}$ $R = 6400 km$ or $6.4 \times 10^6 m$

$V = \sqrt{gR}$

$V = \sqrt{9.8 \times 6.4 \times 10^{6}}$ $\Rightarrow 7.9 kms^{-1}$ Ans

(Q4)
Numerical

$T = ?$ $V = 1.01 kms^{-1}$ $R = 390400 km$

Solution: Formula: $T = \frac{2\pi R}{V}$

$T = \frac{2(3.14)(390400)}{1.01}$ $\Rightarrow 2 \times 3.14 \times 390400 \times \frac{1}{1.01} \times \frac{1}{60 \times 60 \times 24}$

$= 27.5 days$ $= 27.5 days$

(Q6)
Numerical

Length of arc $\Rightarrow S = 2.50 m$

radius $\Rightarrow r = 3.8 \times 10^8 m$

$\theta \Rightarrow$ angle $\Rightarrow ?$

Solution: $S = r\theta \Rightarrow \theta = S/r$

$\theta = \frac{2.50}{3.8 \times 10^8}$ $\Rightarrow 0.657 \times 10^{-8}$

$= 6.6 \times 10^{-9} rad$ Ans

(Q1)

Numerical

Given:

Radius $\Rightarrow r = 3.85 \times 10^8 m$

Radius of the moon $\Rightarrow 1.74 \times 10^6 m$

To Find: $\frac{L_g}{L_o} = ?$

Solution: $L_g = I\omega \qquad I = 2/5\, MR^2$

$L_o = 2/5\, MR^2 m\, \omega$

$L_o = \frac{2}{5} MR^2 m\omega \qquad MR^2 = I$

$\frac{L_g}{L_o} = \frac{2/5\, MR^2 \omega}{Mr^2 \omega} \Rightarrow \frac{2R^2 m^2}{r^2}$

$= \frac{2(1.74 \times 10^6)^2}{5(3.85 \times 10^8)^2} \Rightarrow 0.0816 \times 10^{-4} = \boxed{8.2 \times 10^{-6}}$ Ans

(Q5)

Numerical

Given

$G = 6.67 \times 10^{-11} \qquad M = 6.4 \times 10^{24} \qquad T = 84 sec$

To find: hight $= ?$

Solution

$r = \sqrt[3]{\frac{GMT^2}{4\pi^2}}$

$r = \sqrt[3]{\frac{6.67 \times 10^{-11} \times 6.4 \times 10^{24} \times (84)^2}{4(\pi)^2}}$

$\boxed{r = 4.23 \times 10^4 Km}$