Date: 18-11-2024

LGS GROUP OF COLLEGES

Physics | Assignment | XI

TEST# WK-5

Topic: 5.8 to 5.17	Name:……	Roll No:
Time: 40 mins		Marks =15

Q1. When a hoop is released from the top of an inclined plane of height h, it reaches the bottom rolling without sliding with speed $V_{hoop} = \sqrt{gh}$. Show that the speed of sphere will be $V_{sphere} = \sqrt{\frac{10}{7}gh}$, when sphere roles down the same inclined plane without sliding. (02)

Q2. Prove that critical velocity is 7.9 km/s. (02)

Q3. Weight of a person is W in an elevator at rest. Show that weight will be 2W when elevator is accelerating upward with acceleration equal to g. (02)

Q4. A satellite is moving with speed of 1.01 km/s along an orbital path of radius 390400 km. In how many days it will complete one revolution. (02)

Q5. Orbital radius of a geostationary satellite is given by $r = \left[\frac{GMT^2}{4\pi^2}\right]^{\frac{1}{3}}$.

Find the height of geostationary satellite. (02)

Q6. A tiny laser beam is directed from the earth to the moon. If the beam has diameter of 2.50 m at moon with divergence angle 6.6×10^{-9} radian. Find the distance of moon from earth. (02)

Q7. The moon orbits the earth so that the same side always faces the earth. Determine the ratio of its orbital angular momentum to its spin angular momentum about its own axis. The distance between the earth and the moon is 3.85×10^8 m. radius of the moon is 1.74×10^6 m. (03)