



ASSIGNMENT NO. 3

SUBJECT: PHYSICS

CLASS-XI

OCTOBER'2026

CH: 7 GRAVITATION AND CH 8 SOLIDS

1. A satellite is orbiting around the earth with orbital radius R and time period T . The quantity which remains constant is:
 - a) $\frac{T^2}{R^2}$
 - b) $\frac{T}{R}$
 - c) $\frac{T^2}{R}$
 - d) $\frac{T^2}{R^3}$
2. The period of a planet around sun is 27 times that of earth. The ratio of radius of planet's orbit to the radius of earth's orbit is:
 - a) 27
 - b) 4
 - c) 9
 - d) 64
3. The period of revolution of planet A around the sun is 8 times that of B. The distance of A from the sun is how many times greater than that of B from the sun?
 - a) 3
 - b) 4
 - c) 2
 - d) 5
4. The Young's modulus of the material of a given wire can be determined by using:
 - a) Voltmeter
 - b) Metre bridge
 - c) Sonometer
 - d) Seale's apparatus
5. When a pressure of 100 atmosphere is applied on a spherical ball of rubber, then its volume reduces to 0.01%. The bulk modulus of the material of the rubber in dyne cm^{-2} is
 - a) 100×10^{12}
 - b) 10×10^{12}
 - c) 20×10^{12}

d) 1×10^{12}

1. If radius of earth is 6400km, what will be the weight of 1 quintal body if taken to the height of 1600 km above the sea level? If radius of earth is 6400km, what will be the weight of 1 quintal body if taken to the height of 1600 km above the sea level?
2. Derive an expression for the acceleration due to gravity g at a depth d from the centre of the earth. What happens to g at the centre of the earth.
3. At what height above the earth's surface, is the value of g same as in a mine 80 km deep?
4. Calculate the escape velocity for an atmospheric particle 1600 km above the earth's surface, given that the radius of the earth is 6400 km and acceleration due to gravity on the surface of earth is 9.8 ms^{-2} .
5. Compute the bulk modulus of water from the following data: Initial volume = 100.0 litre, Pressure increase = 100.0 atm ($1 \text{ atm} = 1.013 \times 10^5 \text{ Pa}$), Final volume = 100.5 litre. Compare the bulk modulus of water with that of air (at constant temperature). Explain in simple terms why the ratio is so large.
6. State Kepler's laws of planetary motion.
7. Suppose there existed a planet that went round the sun twice as fast as the earth. What will be its orbital size as compared to that of the earth.
8. If the Young's modulus of steel is $2 \times 10^{11} \text{ Nm}^{-2}$, calculate the work done in stretching a steel wire 100 cm in length and of cross - sectional area 0.03 cm^2 when a load of 20 kg is slowly applied without the elastic limit being reached.
9. Energy stored in stretching a string per unit volume is
 - a) $Y(\text{Strain})^2$
 - b) $\frac{1}{2} \times \text{stress} \times \text{strain}$
 - c) $\frac{1}{2} Y(\text{Stress})^2$
 - d) $\text{stress} \times \text{strain}$
10. What will be the energy stored in a strained wire?
 - a) $\frac{1}{2} \times \text{load} \times \text{stress}$
 - b) $\frac{1}{2} \times \text{load} \times \text{extension}$
 - c) $\frac{1}{2} \times \text{load} \times \text{strain}$
 - d) $\frac{1}{2} \times \text{stress} \times \text{strain}$