

Class-IX
Chapter 10-Gravitation
Assignment

1. State Newton's law of gravitation.
2. Derive the units of universal constant of gravitation G using formula of Newton's law of gravitation.
3. According to Newton's law – every object exerts force of attraction on other object. Why do not the bodies start moving towards each other?
4. Calculate the force of gravitation between the two bodies of mass 70 kg and 100kg kept at a distance of 1km. Ans: 46.2×10^{-14} N
5. What is the value of 'G' at moon?
6. Define acceleration due to gravity. What do you mean by freefall?
7. What is the value of 'g' at the centre of the earth?
8. Explain why a 10 kg object will fall towards the earth with the same acceleration as a 1kg object.
9. Show that the acceleration of a body falling towards the earth is independent of the mass of the body.
10. Define weight of a body. How is it different from mass?
11. Why does weight of body become zero at the centre of earth?
12. Relate kg wt and Newton.
13. A man weighs 60 kgwt on earth. Find his mass and weight on the surface of moon.
Ans : 60 kg., 100 N
14. What is the mass of an object whose weight is 98 N? Ans : 1 kg.
15. A stone is dropped from a height of 5m from the surface of the earth. Take $g=10\text{m/s}^2$
 - (i) What will be its speed just before it hits the ground? Ans : 10m/s.
 - (ii) How much time would it take to reach the ground? Ans : 1 sec.
16. A ball is thrown up with a speed of 20m/s. How high will it go before it begins to fall? Take $g=10\text{m/s}^2$ Ans : 20m.
17. A ball is thrown vertically upward. It reaches maximum height of 19.6m. ($g = 9.8 \text{ m/s}^2$)
 - (i) What is the initial speed of the ball? (ii) How much time is taken by the ball to reach the highest point? Ans (i) 19.6 m/s (ii) 2 sec.

18. The weight of any person on the moon is about $\frac{1}{6}$ times that on the earth. He can lift a mass of 15kg on the earth. What will be the maximum mass, which can be lifted by the same force applied by the person on the moon? Ans. 90 kg.
19. Identical packets are dropped from two airplanes, one above equator and the other above north pole ,both at height h , assuming all conditions are identical, will those packets take same time to reach the surface of earth. Justify your answer.