Ch-9 Gravitation

1. Give the S.I. unit of G and its value.
2. What do these symbols denote – $g = G\frac{M}{R^2}$.
3. When a ball is let free fall from the top of building. What is the acceleration and what is the sign?
4. A ball is projected vertically upwards with an initial velocity 'u' goes to a maximum height 'h' before touching the ground. What is the value of 'h'?
5. How is the weight of an object related to its mass?
6. The mass of the body on earth is 60kg, what is its weight on the earth and on moon.
7. The mass of earth is 6×10^{24} kg and that of the moon is 7.4×10^{22} kg. If the distance between the earth and the moon is 3.84×10^{5} km. Calculate the force exerted by the earth and the moon. [Take $G = 6.67 \times 10^{-11}$ Nm^2 kg^{-2}]
8. Calculate the value of 'g', the acceleration due to gravity.
9. Give the difference between 'g' and 'G'.
10. If ball is thrown up in the sky, what will happen to its value of 'g'?
11. Derive the formula for the universal law of gravitation.
12. A car falls of a ledge and drops to the ground in 0.5 s. Let $g = 10$ ms^{-2}
    a. What is its speed on touching the ground?
    b. What is its average speed during 0.5s?
    c. How high is the ledge from the ground?
13. Earth attracts apple from the tree and it falls on it but the earth does not move towards the apple. Why?
14. Is uniform circular motion taking place at a constant speed or constant velocity? Why?
15. Name the force which is required to maintain a body in uniform circular motion?
16. Is value of 'g' same everywhere?
17. During a free-fall what is the weight of a body. Give reason for the answer.
18. A stone and feather are thrown from a tower, both the objects should reach the ground at same time but it does not. Why?
19. What is the value of 'G', universal gravitational constant?
20. Calculate value of 'g' on moon.
21. Show that the weight of the body on moon = $\frac{1}{6}^{th}$ of the weight of the body on earth.
22. Which force is responsible for stability of our universe?
23. Which force is required to maintain a body in uniform circular motion?
24. What is gravity?
25. How is the weight of an object related to its mass?
26. What is the effect of shape of earth on value of 'g'?
27. Why do we feel uneasy when ferry wheels moves downwards?
28. Derive formula of universal law of gravitation.
29. The acceleration of a freely falling body does not depend on the mass of the body. Prove this.
30. Establish relationship between 'g' and 'G'.
31. What is centripetal force? Define it with example.
32. With what force will body of mass 1 kg get attracted to the earth?