1. Why is Newton's law of gravitation called as universal law of gravitation?
2. If the distance between two objects is increased by a factor of 6, how is the force altered?
3. The mass of the earth is $6\times10^{24}\,kg$ and that of the moon is $7.4\times10^{22}\,kg$. If the distance between the earth and the moon is $3.84\times10^{5}\,km$, calculate the force exerted by the earth on the moon. [$G=6.7\times10^{-11}Nm^2kg^{-2}$]
4. Calculate the force of gravitation due to a child of mass 25 kg on his mother of mass 75 kg standing at a distance of 1 m from each other.

   (Given: $G=\frac{20}{3}\times10^{-11}Nm^2kg$)
5. A mass of 50 kg attracted by a mass of 20 kg lying at a distance of 2m with a force of $1.67\times10^{-8}N$. Find the value of G.
6. Calculate the force of gravitation due to earth on a child weighing 10 kg standing on the ground. (Mass of earth = $6\times10^{24}\,kg$; Radius of earth = $6.4\times10^{3}\,km$ & $G=6.7\times10^{-11}Nm^2/kg^2$)
7. A planet whose mass and radius both were half those of the earth, the acceleration due to gravity at this surface would be

   (a) 19.6 m/s (b) 9.8 m/s^2 (c) 4.9 m/s^2 (4) 2.45 m/s^2
8. If a planet existed whose mass was twice that of the earth and whose radius 3times greater, a 10 kg mass on its surface will weigh.

   (a) 21.7 N (b) 4.4 N (c) 6.7 N (d) 13.3 N

   Choose the correct answer.
9. Mass of an object is 10 kg. What is its weight on the earth?
10. What is the mass of object whose weight is 49 N?
11. A force of 100 N is applied to an object of area $2m^2$. Calculate the pressure.
12. A man weighs 600N on the earth, what is its mass? If it was taken to the moon, his weight would be 100 N. What is his mass on moon? What is his accelerations due to gravity on the moon.
13. A car falls off a ledge and drops to the ground in 0.5s. Let $g=10\,\mathbf{m/s^2}$.
    (i) What is its speed on striking the ground?
    (ii) What is its average speed during the 0.5 s?
    (iii) How high is the ledge from the ground?
14. An object is thrown vertically upwards and rises to a height of 10m. Calculate
    (i) the velocity with which the object was thrown upwards and
    (ii) the time taken by the object to reach the highest point.
15. To estimate the height of a bridge over a river, a stone is dropped freely in the river from the bridge. The stone takes 2 seconds to touch the water surface in the river. Calculate the height of the bridge from the water level $(g=9.8\,\mathbf{m/s^2})$.
16. A block of wood is kept on a table top. The man of wooden block is 5 kg and its dimensions are 40 cm × 20 cm × 10 cm. Find the pressure exerted by the wooden block on the table top if it is made to lie on the table top with its sides of dimensions
    (a) 20 cm × 10 cm
    (b) 40 cm × 20 cm

17. When a ball is thrown vertically upwards, it goes through a distance of 19.6 m. Find the initial velocity of the ball and the time taken by it to rise to the highest point. (Acceleration due to gravity, $g = 9.8 \mathbf{m/s^2}$)

18. A ball is thrown up with a speed of 15 m/s. How high will it go before it begins to fall? $(g = 9.8 \mathbf{m/s^2})$.

19. Give reason for the following :
    (a) Why school bags have wide straps?
    (b) Why a sharp knife cuts better than a blunt knife?
    (c) Why a nail has a pointed tip?
    (d) Why buildings have wide foundations?
20. The mass of 2 m^3 of steel is 15600 kg. Calculate the density of steel is S.I. units.
21. When an aluminium object is immersed in water it displaces 5 kg of water. How much is the buoyant force acting on the aluminium object in Newton? $(g = 10\,\mathbf{m/s^2})$
22. An object of mass 50 kg has a volume of 20 m^3. Calculate the density of the object. If the density of water be $1\,\mathbf{g/cm^3}$. State whether the object will float or sink in water.
23. The relative density of silver is 10.8. If the density of water be $1\times10^3\,\mathbf{kg/m^3}$. Calculate the density of silver is S.I. units.
24. The volume of a solid mass 500g is $\mathbf{350\,cm^3}$,
    (a) What will be the density of this solid?
    (b) What will be the mass of water displaced by this solid?
    (c) What will be the relative density of the solid?
    (d) Will it float or sink in water?