

1. The equation $F = \frac{Gm_1m_2}{r^2}$ is valid for

(a) rectangular bodies (b) circular bodies
(c) elliptical bodies (d) spherical bodies.

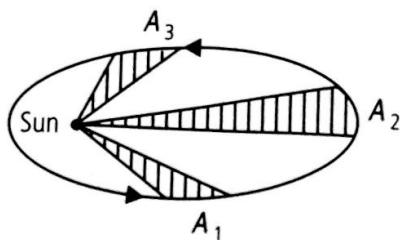
2. The force of gravitation between two bodies of mass 1kg each kept at a distance of 1m is

(a) 6.67N (b) 6.67×10^{-9} N (c) 6.67×10^{-7} N (d) 6.67×10^{-11} N.

3. The universal law of gravitation is the force law also known as the

(a) triangular law (b) square law (c) inverse square law (d) parallelogram law.

4. A planet moving around sun sweeps out area A_1 in two days, A_2 in three days and A_3 in six days. Then the relation between A_1, A_2 and A_3 is



11. A stone drops from the edge of the roof. It passes a window 2m high in 0.1s . How far is the roof above the top of the window?
(a) 15m (b) 1.5m (c) 10m (d) 19.4m

12. Suppose a planet exists whose mass and radius both, are half those of Earth. Calculate the acceleration due to gravity on the surface of this planet.
(a) 19.6m/s^2 (c) 10.6m/s^2 (b) 15.6m/s^2 (d) 20m/s^2

13. A stone is allowed to fall from the top of a tower 100m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m / s . Calculate when the two stones will meet.
(a) 4s (b) 3.6s (c) 2s (d) 8 s

14. The mass of a body is measured to be 12kg on the earth If it is taken to the moon, its mass will be
(a) 12kg (b) 6kg (c) 2kg (d) 72kg .

15. If more force is required to bring a body into a unit acceleration, the body has
(a) less mass (b) zero mass
(c) more mass (d) mass is independent of force.

16. What is the mass of an object whose weight is 49N on the earth?
(a) 5kg (b) 20kg (c) 15kg (d) 12kg

17. If a planet existed whose mass was twice that of Earth and whose radius 3 times greater, how much will a 1kg mass weigh on the planet?
(a) 25N (b) 2.17N (c) 1.1N (d) 5N

18. In spaceship moving in space, person experience weightlessness as the value of
(a) mass is zero (b) acceleration due to gravity is zero
(c) gravitational force is zero (d) none of these

19. Pascal is a unit of
(a) pressure (b) force (c) linear momentum (d) energy.

20. A tank with length 10m , breadth 8m and depth 6m is filled with water up to top. If $g=10\text{m/s}^2$ and density of water = 1000kg/m^3 , then the thrust on the bottom is
(a) $(6 \times 1000 \times 10 \times 80)\text{N}$ (b) $(3 \times 1000 \times 10 \times 48)\text{N}$
(c) $(3 \times 1000 \times 10 \times 60)\text{N}$ (d) $(3 \times 100 \times 10 \times 80)\text{N}$.

21. A cubical block of water is dipped completely in water. Each edge of the block is 1cm in length. Find the buoyant force acting on the block.
(a) 10^{-2}N (b) 10^{-3}N (c) 10^{-1}N (d) 10N

22. A body floats in a liquid if the buoyant force is
(a) zero (b) greater than its weight
(c) less than its weight (d) equal to its weight.

23. How much force should be applied on an area of 1cm^2 to get a pressure of 15Pa ?
(a) $1.5 \times 10^{-3}\text{N}$ (b) 1.5N (c) $1.5 \times 10^{-2}\text{N}$ (d) $1.1 \times 10^{-3}\text{N}$

24. Loss of weight of a body immersed in a liquid is
(a) equal to the weight of the liquid displaced (b) more than the weight of the liquid displaced
(c) less than the weight of the liquid displaced (d) zero.

25. A solid of density D is floating in a liquid of density d . If V is the volume of solid submerged in the liquid and V' is the total volume of the solid, then V/V' is equal to
 (a) $\frac{d}{D}$ (b) $\frac{D}{d}$ (c) $\frac{D}{d+D}$ (d) $\frac{D+d}{D}$.

26. The mass of bottle is 25g when empty, 50g when filled completely with water and 365g when filled completely with mercury. Find the density of mercury.
 (a) 1360kg/m^3 (b) 13600kg/m^3 (c) 1200kg/m^3 (d) 120kg/m^3

27. Relative density of silver is 10.8. The density of water is 10^3kg/m^3 . What is the density of silver in SI units?
 (a) $10.8 \times 10^3\text{kg/m}^3$ (b) $12.3 \times 10^3\text{kg/m}^3$ (c) $10.8 \times 10^2\text{kg/m}^3$ (d) $11.7 \times 10^3\text{kg/m}^3$

28. A bottle weighs 30g when empty, 53.4g when filled with a liquid and 48g when filled with water. Calculate the density of the liquid. Given, density of water at $4^\circ\text{C} = 1000\text{kg/m}^3$.
 (a) 1400kg/m^3 (b) 1350kg/m^3 (c) 1300kg/m^3 (d) 1200kg/m^3

29. The volume of a 600g sealed packet is 450cm^3 which is placed in water. What will be the mass of the water displaced by this packet? (Take density of water = 1g/cm^3)
 (a) 450g (b) 400g (c) 250g (d) 200g

30. What is the unit of relative density?
 (a) kgm^3 (b) kg/m^3 (c) per 3 (d) It is unitless.

31. The value of acceleration due to gravity
 (a) is same on equator and poles (b) is least on poles
 (c) is least on equator (d) increases from pole to equator.

32. A boy is whirling a stone tied with a string in a horizontal circular path. If the string breaks, the stone
 (a) will continue to move in the circular path
 (b) will move along a straight line towards the centre of the circular path
 (c) will move along a straight line tangential to the circular path
 (d) will move along a straight line perpendicular to the circular path away from the boy.

33. In the relation $F = GMm/d^2$, the quantity G
 (a) depends on the value of g at the place of observation
 (b) is used only when the earth is one of the two masses
 (c) is greatest at the surface of the earth
 (d) is universal constant of nature.

34. Two particles are placed at some distance. If the mass of each of the two particles is doubled, keeping the distance between them unchanged, the value of gravitational force between them will be
 (a) $\frac{1}{4}$ times (b) 4 times (c) $\frac{1}{2}$ times (d) unchanged.

35. The atmosphere is held to the earth by
 (a) gravity (b) wind
 (c) clouds (d) earth's magnetic field.

Assertion-Reason Codes:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

38. Assertion: Gravitational constant G is the same everywhere in the universe.
Reason: G has the same value in all system of units.

39. Assertion: The value of the acceleration due to gravity g on earth depends upon the average density of the earth.
Reason: It is the radius of the earth which determines the value of the g .

40. Assertion: During a journey from the earth to the moon and back, maximum fuel is spent to overcome the earth's gravity at take off.
Reason: Earth's mass is much greater than that of the moon.

41. Assertion: For the same change in the value of g to occur, the depth (d) below the surface of earth must be equal to twice the height (h) above the surface of earth.
Reason: The acceleration due to gravity (g) changes less with depth than with height.

42. Assertion: A man is sitting in a boat which floats on a pond. If the man drinks some water from the pond, the level of water in the pond will decrease.
Reasons. The weight of the liquid displaced by the body is greater than the weight of the body.

43. Assertion: By tying a stone to a wooden plank, an object can be made such that it floats in a river and sink in the ocean.
Reason: Density of river water is more than the density of sea-water.

44. Assertion: A block of ice with a lead shot embedded in it floats on water contained in a vessels. The temperature of the system is kept at 0°C as the ice melts. When ice has melted completely, water level in the vessel rises.
Reason: The melted ice will raise the water level.

45. Assertion: An object floats if it displaces an amount of liquid whose weight of greater than the actual weight of the object.
Reason: During floatation an object experiences no net force in the downward direction.