NCERT ANNEXURE

Below are the solutions for Subjective type questions from NCERT Annexure.

1.   What do you mean by acceleration due to gravity?

Ans. When an object is dropped from some height, its velocity increases at a constant rate. In other words, when an object is dropped from some height, a uniform acceleration is produced in it by the gravitational pull of the earth and this acceleration does not depend on the mass of the falling object. The uniform acceleration produced in a freely falling object due to the gravitational force of the earth is known as acceleration due to gravity (g). The value of acceleration due to gravity (g) changes slightly from place to place but for most of the purposes it is taken to be 9.8 m/s^2.

2.   Amit buys few grams of gold at the poles as per the instructions of one of his friends. He hands over the same when he meets him at the equator. Will his friend agree with the weight of gold bought? If not, why? (Hint. The value of g is greater at the poles than at the equator).

Ans. No, the friend at equator will not agree with the weight of gold bought at the poles. This can be explained as follows:

We know that weight, $W = m \times g$. Now, since the value of g is greater at the poles, so the weight of a certain mass of gold will be greater at the poles (where it is bought). When the same mass of gold is brought to equator, then its weight will be found to be less because the value of g is less at the equator. Thus, a certain mass of gold bought at the poles will have lesser weight at the equator.

3.   A stone is released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground.

Ans. According to the equation of motion under gravity $v^2 - u^2 = 2gs$

Where,

u = Initial velocity of the stone = 0 m/s

v = Final velocity of the stone

s = Height of the stone = 19.6 m

g = Acceleration due to gravity = 9.8 ms^{-2}

∴ $v^2 - 0^2 = 2 \times 9.8 \times 19.6$

⇒ $v^2 = 2 \times 9.8 \times 19.6 = (19.6)^2$

⇒ $v = 19.6$ ms^{-1}

4. **The volume of 50 g of a substance is 20 cm3. If the density of water is 1 g/cm3, will the substance float or sink?**

Ans. Given, the mass of the substance = 50 g

Volume of the substance = 20 cm3

Density of substance = Mass /Volume

= (50 /20) g/cm3

= 2.5 g/cm3

Since the density of the substance 2.5 g/cm3 is greater than the density of water (1 g/cm3), so the substance will sink in the water.

5. **You find your mass to be 42 kg on a weighing machine. Is your mass more or less than 42 kg?**

Ans. Even gases (like air) exert an upward force (or buoyant force) on the objects placed in them. Now, when we stand on a weighing machine, then the air exerts an upward force on our body and makes is slightly lighter than we actually are.

So, if a weighing machine shows our mass to be 42 kg, then our actual mass will be slightly more than 42 kg.

NCERT EXEMPLAR

Multiple choice questions:

1. **A boy is whirling a stone tied with a string in an 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

Ans. (c)

2. **In the relation $F = G M m/d^2$, 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

Ans. (d)

3. **Law of gravitation gives the gravitational force between**
   (a) the earth and a point mass only   (b) the earth and Sun only
   (c) any two bodies having some mass   (d) two charged bodies only

Ans. (c)

4. **An object weighs 10 N in air. When immersed fully in water, it weighs only 8 N. The weight of the liquid displaced by the object will be**
   (a) 2 N   (b) 8 N   (c) 10 N   (d) 12 N

Ans. (a)

5. **A girl stands on a box having 60 cm length, 40 cm breadth and 20 cm width in three ways. In which of the following cases, pressure exerted by the brick will be**
    (a) maximum when length and breadth form the base
    (b) maximum when breadth and width form the base
    (c) maximum when width and length form the base
    (d) the same in all the above three cases

Ans. (b)