Chapter-3

Worksheet-1

Section 1

Q1. Define Gravity.

Q2. State Universal Law of Gravitation. And Deduce its equation.

Q3. Differentiate between 'G' and 'g'.

Q4. How does the value of 'g' changes when we move:

    I.   Away from the surface of the earth?
    II.   Towards the centre of the earth?

Q5. What is weight? How it is different from mass?

Q6. Given that, The Mass of Earth = 5.98×10^{24} kg, Radius of earth = 6.37×10^6 m, Mass of moon = 7.36×10^{22} kg and Radius of moon = 1.76×10^6 m. What does an object weigh at moon when it weighs 120 N on earth?

Q7. Trust and Pressure have same unit of measurement. Then how these are different from one and another?

Q8. Explain the term 'Buoyancy'.

Q9. Explain Archimedes Principle and State its applications.

Q10. If radius of earth is 64000 km and mass of earth is 6×10^{24} kg, Calculate the value of 'g'.

Section 2

Q11. Two objects of different masses falling freely near the surface of the moon would

    a) have same velocities at any instant

b) have different acceleration

c) experience forces of same magnitude

d) undergo a change in their inertia

   Answer: a

Q12. 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

   Answer: c

Q13. The gravitational force between two objects is F. If masses of both objects are halved without changing the distance between them, then the gravitational force would become

   a) $\frac{F}{4}$

   b) $\frac{F}{2}$

   c) F

   d) $2F$

   Answer: a

Q14. A boy is whirling a stone tied to 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

Answer: c

Q15. An object is put one by one in three liquids having different densities. The object floats with $\frac{1}{9}$, $\frac{2}{11}$ and $\frac{3}{7}$ parts of their volumes outside the liquid surface in liquids of densities d_1, d_2 and d_3 respectively. Which of the following statement is correct?

 a) $d_1 > d_2 > d_3$
 b) $d_1 > d_2 < d_3$
 c) $d_1 < d_2 > d_3$
 d) $d_1 < d_2 < d_3$
  Answer: d

Q16. In the relation $F = \frac{GMm}{d^2}$, 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 the universal constant of the nature.
  Answer: d

Q17. Law of gravitation gives the gravitational force between

 a) The earth and a point mass only
 b) The earth and the sun only
 c) Any two body having some mass
 d) Two charges bodies only
  Answer: c

Q18. The atmosphere is held to the Earth by

 a) Gravity
 b) Wind

c) Clouds

d) Earth's magnetic field

Answer: a

Q19. The weight of an object at the centre of the Earth of radius R is

a) zero

b) Infinite

c) R times the weight at the surface of the Earth

d) $\frac{1}{R^2}$ times the weight at the surface of the Earth

Answer: a

Q20. 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

Answer: a