

Time : 1 hour 30 Minute


STD 9 Science  
Chapter Based Test

Total Marks : 50

section A

\* Choose the correct option from the given options

[7]

- The weight of a boy on the surface of the moon is 300N. The weight of this boy on the surface of the earth is:  
(A) 300N (B) 5N (C) 50N (D) 1800N
- An object is put in three liquids having different densities, one by one. The object floats with  $\frac{1}{9}$ ,  $\frac{2}{11}$  and  $\frac{3}{7}$  parts of its volume outside the surface of liquids of densities  $d_1$ ,  $d_2$  and  $d_3$  respectively. Which of the following is the correct order of the densities of the three liquids ?  
(A)  $d_1 > d_2 > d_3$  (B)  $d_2 > d_3 > d_1$  (C)  $d_1 < d_2 < d_3$  (D)  $d_3 > d_2 > d_1$
- 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)  $d_1 < d_2 < d_3$ .
- Three spheres have radii 1cm, 2cm and 3cm, respectively. Which sphere exerts maximum pressure on earth?  
(A) First (B) Second (C) Third (D) All equal
- The upward force acting on the body immersed in a fluid is called:  
(A) Equilibrium force (B) Buoyant force (C) True weight (D) Net force
- The value of  $g$  on the surface of moon is:  
(A) zero (B) The same as on the surface of the earth (C) More than that on the surface of the earth (D) Less than that on the surface of the earth
- A solid of density  $900\text{kg/m}^3$  floats in oil as shown in the given diagram. The oil floats on water of density  $1000\text{kg/m}^3$  as shown. The density of oil in  $\text{kg/m}^3$  could be:  
  
a. 850  
b. 900  
c. 950  
d. 1050

\* Fill in the blank with correct answer

[4]

- Fill in the following blanks with suitable word:  
The acceleration due to gravity on the moon is about \_\_\_\_\_ of that on the earth.

9. Fill in the following blanks with suitable word:  
If the area of a snow shoe is five times \_\_\_\_\_ than the area of an ordinary shoe, then the pressure of a snow shoe on the snow is five times \_\_\_\_\_.
10. Fill in the following blanks with suitable word:  
Snow shoes work by spreading out a person's \_\_\_\_\_ over a much bigger \_\_\_\_\_.
11. Fill in the following blanks with suitable word:  
In order that the force of gravitation between two bodies may become noticeable and cause motion, one of the bodies must have an extremely large \_\_\_\_\_.

**\* Do as directed**

[3]

12. Name the forces acting on an object while immersed in a liquid.
13. What is upthrust?
14. Explain why, if a stone held in our hand is released, it falls towards the earth.

**section B**

**\* Answer the Questions in brief**

[10]

1. How does the force of gravitation between two objects change when the distance between them is reduced to half ?
2. Write the formula to find the magnitude of the gravitational force between the earth and an object on the surface of the earth.
3. What is pascal?
4. How is weight related to mass? Is weight of a body constant?
5. What is the actual shape of the orbit of a planet around the sun? What assumption was made by Newton regarding the shape of an orbit of a planet around the sun for deriving his inverse square rule from Kepler's third law of planetary motion?

**section C**

**\* Answer the Questions in detail**

[12]

1. The distance of a planet from the sun is 40 times that of the earth. What is the ratio of their time periods of revolution around the sun?
2. State Archimedes' principle. List its two applications.
3. When a cricket ball is thrown vertically upwards, it reaches a maximum height of 5 meters.
- What was the initial speed of the ball?
  - How much time is taken by the ball to reach the highest point? ( $g = 10\text{ms}^{-2}$ )
4. A stone is thrown vertically upwards with a speed of 20m/s. How high will it go before it begins to fall? ( $g = 9.8\text{m/s}^2$ )

**section D**

**\* Answer the Questions in detail [ 5 marks each ]**

[10]

- 1.

Suppose a planet exists whose mass and radius both are half those of the earth. Calculate the acceleration due to gravity on the surface of this planet.

2. How does the force of attraction between the two bodies depend upon their masses and distance between them? A student thought that two bricks tied together would fall faster than a single one under the action of gravity. Do you agree with his hypothesis or not? Comment.

### Section E

\* **case study based question.**

[4]

1. We know that the earth attracts every object with a certain force and this force depends on the mass ( $m$ ) of the object and the acceleration due to the gravity ( $g$ ). The weight of an object is the force with which it is attracted towards the earth. Mathematically

$$W = m \times g$$

Where,  $W$  = weight of object

$m$  = mass of object

$g$  = acceleration due to the gravitational force

As the weight of an object is the force with which it is attracted towards the earth, the SI unit of weight is the same as that of force, that is, Newton (N). The weight is a force acting vertically downwards; it has both magnitude and direction. We have learnt that the value of  $g$  is constant at a given place. Therefore at a given place, the weight of an object is directly proportional to the mass, say  $m$ , of the object, that is,  $W \propto m$ . It is due to this reason that at a given place, we can use the weight of an object as a measure of its mass. Answer the following questions.

**(i) Unit of acceleration due to the gravity ( $g$ ) is**

- (a) m/s
- (b)  $m/s^2$
- (c) Newton(N)
- (d) None of these

**(ii) Direction of weight of any object is**

- (a) Always towards centre of earth
- (b) Always away from centre of earth
- (c) Weight don't have direction
- (d) None of these

**(iii) Which of the following has same unit**

- (a) Mass and weight
- (b) Weight and force
- (c) Velocity and acceleration
- (d) None of these

**(iv) Whether weight is scalar quantity or vector quantity? Justify your answer.**

**(v) Differentiate between mass and weight.**

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