

# Core Natural Science

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### MCQ'S ON GRAVITATION

Question 1.

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

Answer: (a) have same velocities at any instant

Question 2.

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

Answer: (c) is least on equator

Question 3.

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)  $F/4$
- (b)  $F/2$
- (c)  $F$
- (d)  $2F$

Answer

Answer: (a)  $F/4$

Question 4.

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

Answer: (c) will move along a straight line tangential to the circular path

**Question 5.**

An object is put one by one in three liquids having different densities. The object floats with 19, 211 and 37 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

Answer: (d)  $d_1 < d_2 < d_3$

**Question 6.**

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

Answer

Answer: (d) is universal constant of nature

**Question 7.**

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

Answer

Answer: (c) any two bodies having some mass

Question 8.

The value of quantity  $G$  in the law of gravitation

- (a) depends on mass of Earth only
- (b) depends on radius of Earth only
- (c) depends on both mass and radius of Earth
- (d) is independent of mass and radius of the Earth

Answer

Answer: (d) is independent of mass and radius of the Earth

Question 9.

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) 14 times
- (b) 4 times
- (c) 12 times
- (d) unchanged

Answer

Answer: (b) 4 times

Question 10.

The atmosphere is held to the Earth by

- (a) gravity

- (b) wind
- (c) clouds
- (d) Earth's magnetic field

Answer

Answer: (a) gravity

Question 11.

The force of attraction between two unit point masses separated by a unit distance is called

- (a) gravitational potential
- (b) acceleration due to gravity
- (c) gravitational field
- (d) universal gravitational constant

Answer

Answer: (d) universal gravitational constant

Question 12.

The weight of an object at the centre of the Earth of radius  $R$  is (NCERT Exemplar)

- (a) zero
- (b) infinite
- (c)  $R$  times the weight at the surface of the Earth
- (d)  $1/R^2$  times the weight at surface of the Earth

Answer

Answer: (a) zero

Question 13.

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

Answer: (a) 2 N

Question 14.

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 box 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

Answer

Answer: (b) maximum when breadth and width form the base

Question 15.

An apple falls from a tree because of gravitational attraction between the Earth and the apple. If  $F_1$  is the magnitude of force exerted by the Earth on the apple and  $F_2$  is the magnitude of force exerted by the apple on the Earth, then

- (a)  $F_1$  is very much greater than  $F_2$
- (b)  $F_2$  is very much greater than  $F_1$

- (c)  $F_1$  is only a little greater than  $F_2$
- (d)  $F_1$  and  $F_2$  are equal

Answer

Answer: (d)  $F_1$  and  $F_2$  are equal

Question 16.

The acceleration due to gravity on the Earth depends upon the

- (a) mass of the body
- (b) mass of the Earth
- (c) shape and size of the body
- (d) volume of the body

Answer

Answer: (b) mass of the Earth

Question 17.

When a mango falls from a mango tree then

- (a) only the Earth attracts the mango.
- (b) only the mango attracts the Earth.
- (c) both the mango and the Earth attract each other.
- (d) both the mango and the Earth repel each other.

Answer

Answer: (c) both the mango and the Earth attract each other.

Question 18.

When a ship floats in sea water

- (a) The weight of water displaced is greater than the weight of ship

- (b) The weight of water displaced is less than the weight of the ship
- (c) The weight of water displaced is equal to the weight of the ship
- (d) It displaces no water.

Answer

Answer: (c) The weight of water displaced is equal to the weight of the ship

Question 19.

The SI unit of pressure is

- (a) Nm<sup>2</sup>
- (b) N/m
- (c) N/m<sup>2</sup>
- (d) N<sup>2</sup>/m<sup>2</sup>

Answer

Answer: (c) N/m<sup>2</sup>

Question 20.

If the gravitational attraction of the Earth suddenly disappears, which of the following statements will be true?

- (a) The weight of body will become zero but the mass will remain same.
- (b) The weight of a body will remain same but the mass will become zero.
- (c) Both mass and weight become zero.
- (d) Neither mass nor weight becomes zero.

Answer

Answer: (a) The weight of body will become zero but the mass will remain same.

**Fill in the blanks**

1. Gravitational force is always ..... in nature.

Answer

Answer: attractive

2. .... of a body is the quantity of matter contained in it.

Answer

Answer: Mass

3. SI unit of mass is .....

Answer

Answer: kilogram

4. Weight of an object is the force with which it is attracted towards the .....

Answer

Answer: Earth

5. The acceleration due to gravity of moon is ..... of that of the Earth.

Answer

Answer: one sixth

6. Every fluid exerts an ..... force on a body immersed in it. This force is called .....

Answer

Answer: upward, buoyant

7. Density of a substance is defined as mass per unit .....

Answer

Answer: volume

8. The force acting on an object ..... to the surface is called thrust.

Answer

Answer: perpendicular

9. The relative density of a substance is the ratio of its density to that of .....

Answer

Answer: water

**Match the following columns**

Column A    Column B

(a) SI unit of Weight (i) Kilogram

(b) mass    (ii)  $F = G\frac{m_1m_2}{r^2}$

(c) Weight    (iii) mg

(d) Buoyant force    (iv) newton

(e) Relative density    (v) Ratio of density of the substance to that of water

(f) SI unit of mass    (vi) Quantity of matter contained in a body

(g) Gravitational force between two bodies (expression)    (vii) Force acting on body due to Earth's attraction

(viii) Weight of an object (expression)      (viii) Upward force on a body placed in a fluid

**Answer:**

Column A      Column B

(a) SI unit of Weight (iv) newton

(b) mass      (vi) Quantity of matter contained in a body

(c) Weight      (vii) Force acting on body due to Earth's attraction

(d) Buoyant force      (viii) Upward force on a body placed in a fluid

(e) Relative density      (v) Ratio of density of the substance to that of water

(f) SI unit of mass      (i) Kilogram

(g) Gravitational force between two bodies (expression)      (ii)  $Gm_1m_2/r^2$

(viii) Weight of an object (expression)      (iii) mg

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