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Multiple Choice Questions

1. The force with which the Earth attracts an object towards its centre is called

(a) Magnetic force
(b) Electrostatic force
(c) Gravitational force
(d) Muscular force

2. The SI unit of force is

(a) Dyne
(b) Joule
(c) Newton
(d) Watt

3. The force of gravitation between two objects depends on their

(a) Shapes and sizes
(b) Masses and distance between them
(c) Volumes and densities
(d) Velocities and directions

4. The value of acceleration due to gravity on Earth is approximately

(a) 8.9 m/s^2
(b) 9.8 m/s^2
(c) 10.8 m/s^2
(d) 9.0 m/s^2

5. Which of the following quantities remains constant for a freely falling object?

(a) Velocity
(b) Acceleration
(c) Distance travelled
(d) Time

6. The weight of an object on the Moon is about

(a) Equal to its weight on Earth
(b) Half of its weight on Earth
(c) One-sixth of its weight on Earth
(d) Double its weight on Earth

7. Mass of an object is

(a) Dependent on gravity
(b) Different at different places
(c) A vector quantity
(d) Independent of location

8. The force that keeps planets in their orbits around the Sun is

(a) Frictional force
(b) Muscular force
(c) Gravitational force
(d) Contact force

9. An object thrown vertically upward comes down because of

(a) Air pressure
(b) Inertia
(c) Friction
(d) Gravity

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10. The SI unit of acceleration due to gravity is

(a) m/s (b) m/s^2

(c) kg/m^2 (d) N/kg

Fill in the blanks :

11. The universal law of gravitation was given by _____.

12. The weight of an object is the product of its mass and _____.

True / False

13. The mass of an object changes from place to place.

14. Gravitational force is always attractive.

Very Short Type Questions

15. What is gravitation?

16. Define acceleration due to gravity.

Short Type Questions

17. Why do objects fall towards the Earth when dropped from a height?

18. Differentiate between mass and weight.

Essay Type Questions

19. State the universal law of gravitation. Explain its importance and applications in daily life.

20. Define mass and weight. Explain why the weight of an object changes but its mass remains constant.

HOTS

21. **Assertion (A):**An object weighs less on the Moon than on the Earth.

Reason (R): The acceleration due to gravity on the Moon is less than that on the Earth.

a) Both A and R are true and R is the correct explanation of A

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

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1. **(c)** Gravitational force
2. **(c)** Newton
3. **(b)** Masses and distance between them
4. **(b)** 9.8 m/s^2
5. **(b)** Acceleration
6. **(c)** One-sixth of its weight on Earth
7. **(d)** Independent of location
8. **(c)** Gravitational force
9. **(d)** Gravity
10. **(b)** m/s^2
11. Sir Isaac Newton
12. Acceleration due to gravity
13. False
14. True
15. Gravitation is the force of attraction between any two masses in the universe.
16. Acceleration due to gravity is the acceleration produced in a body due to the gravitational pull of the Earth.
17. Objects fall towards the Earth because the Earth exerts a gravitational force on them, pulling them towards its centre.
18. Mass is the amount of matter in an object and remains constant everywhere, while weight is the gravitational force acting on an object and changes from place to place.
19. The universal law of gravitation, given by Isaac Newton, states that every object in the universe attracts every other object with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. This gravitational force always acts along the line joining the centres of the two objects.
This law explains many natural phenomena. It explains why objects fall towards the Earth when dropped from a height. It also explains the motion of planets around the Sun and the motion of the Moon around the Earth. The gravitational pull of the Moon and the Sun on the Earth causes tides in the oceans. Gravitation also helps in understanding the formation of the solar system and the structure of galaxies. Thus, the universal law of gravitation plays a vital role in explaining both terrestrial and celestial phenomena.

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20. Mass is defined as the amount of matter contained in an object. It is a scalar quantity and remains constant everywhere in the universe. The SI unit of mass is kilogram. Mass does not depend on gravity and hence does not change from place to place.

Weight is the force with which an object is attracted by the Earth towards its centre. It is given by the product of mass and acceleration due to gravity. Weight is a vector quantity and its SI unit is newton. Since the value of acceleration due to gravity varies from place to place, the weight of an object also changes.

For example, the weight of an object on the Moon is less than its weight on the Earth because the gravitational force on the Moon is weaker. However, the mass of the object remains the same in both places. This explains why weight changes but mass remains constant.

21. Correct option: a

Explanation: The gravitational pull of the Moon is weaker than that of the Earth because the acceleration due to gravity on the Moon is less. Therefore, an object weighs less on the Moon.

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