PM SHRI KENDRIYA VIDYALAYA GACHIBOWLI, GPRA CAMPUS, HYD-32

PRACTICE PAPER 07 (2024-25)

CHAPTER 09 GRAVITATION

SUBJECT: SCIENCE **MAX. MARKS : 40**

CLASS : IX **DURATION : 1½ hrs**

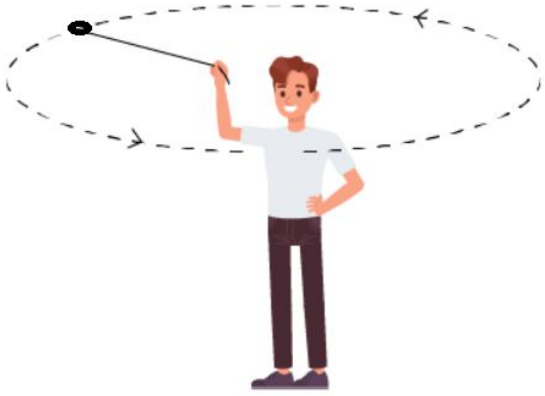
General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. As indicated in the figure given below, a boy is whirling a stone tied with a thread in a horizontal circular path:

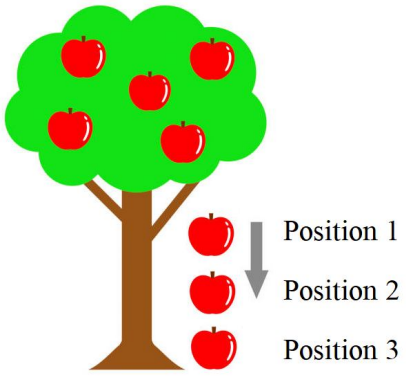


If the stone is broken from the string, it:
(a) will proceed in a straight line towards the circular path's centre.
(b) will move in a tangential to the circular path straight line.
(c) will move away from the boy in a straight line perpendicular to the circular path.
(d) will keep moving in a circular pattern.

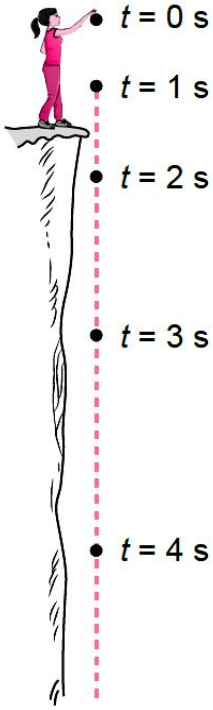
2. A paper and a stone are dropped from the top of a building. Which one will reach the ground first and why?
(a) The stone, because it is heavier (air resistance plays no part.)
(b) The stone, only because it faces much less air resistance.
(c) The paper, because it is lighter (air resistance plays no part.)
(d) The paper, only because it faces much less air resistance.

3. When a ship floats in seawater:
(a) the weight of water displaced is larger than the ship's weight
(b) the weight of water displaced is less than the ship's weight
(c) the weight of water displaced is equal to the ship's weight
(d) it displaces no water

4. The drawing shows an apple falling to the ground. In which of the three positions does gravity act on the apple?



(a) Position 1 only (b) Positions 1 and 2
(c) Positions 1, 2 and 3 (d) Position 3 only
Ans. (c) Positions 1, 2 and 3

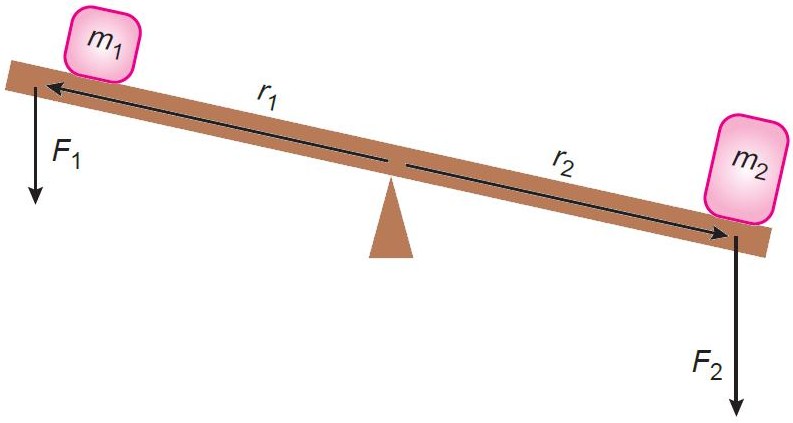


5. A ball is dropped from a height and the distance covered by the ball each second is recorded. The image shows the distance the ball covers each second.
What can be understood about the effect of gravitational force of Earth on the ball?
(a) It causes the ball to decrease its speed of fall.
(b) It causes the ball to fall with a constant speed.
(c) It increases the distance covered by the ball with every passing second.
(d) It decreases the distance covered by the ball with every passing second.

6. A body has a mass of 2 kg. When will the mass of the body change?
(a) When the body is taken to the moon.
(b) When the body is dropped from a height.
(c) When the body is being pulled along a smooth surface.
(d) The mass of the body will not change unless it is cut or broken.

7. Mass of a man is 75 kg and he has reached the centre of the Earth. The mass and weight of man at the Earth's centre, with radius R, respectively, will be:
(a) 75 kg, 75 N (b) 75 kg, 0 N (c) 0 kg, 0 N (d) 75 kg, 735 N

8. The image shows a two blocks of mass m_1 and m_2 on wooden plank, which is pivoted at its center.



The weights are r_1 and r_2 distances apart from the point of pivot. Under what condition do the weights get balanced on the wooden plank?
(a) When $m_1 < m_2$ and $r_1 = r_2$.
(b) When $m_1 < m_2$ and $r_1 < r_2$.
(c) When $m_1 > m_2$ and $r_1 > r_2$.
(d) When $m_1 = m_2$ and $r_1 = r_2$.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** At the centre of the Earth, a body has no centre of gravity.
Reason (R): g = 0 at the centre of Earth.

10. **Assertion (A):** An object thrown vertically upward with certain velocity v, reaches maximum height and fall back with same velocity.
Reason (R): Whenever an object falls towards the Earth, gravitational force of the Earth causes acceleration.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. If the moon attracts the earth, why does the earth not move towards the moon?

12. Why does a body reach the ground quicker at poles than at the equator when dropped from the same height?

13. If the volume of 50 g of a substance is 20 cm^3 and the density of water is 1 g/cm^3, will the substance float or sink? Why?

14. (i) What is the source of centripetal force that a planet requires to revolve around the Sun? On what factors does that force depend?
(ii) Suppose gravity of Earth suddenly becomes zero, then which direction will the Moon begin to move if no other celestial body affects it?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. What is the magnitude of the gravitational force between the earth and a 1 kg object on its surface? (Mass of the earth is 6×10^{24} kg and radius of the earth is 6.4×10^6 m).

16. What happens to the force between two objects, if
(i) the mass of one object is doubled?
(ii) the distance between the objects is doubled and tripled?
(iii) the masses of both objects are doubled?

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

SECTION – D

Questions 18 carry 5 marks each.

18. A stone is allowed to fall from the top of a tower 100 m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m/s. Calculate when and where the two stones will meet.

OR

A ball thrown up vertically returns to the thrower after 6 s. Find
(a) the velocity with which it was thrown up,
(b) the maximum height it reaches, and
(c) its position after 4 s.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Read the following information and answer the questions based on information and related studied concepts.

Sahil was driving the car at a very high speed to reach the hospital and he tried to drift the car. But the car slides from a ledge and falls to the ground in 2 seconds due to brake failure. Take acceleration due to gravity, g = 10 m/s^2.

(a) What is the speed at which the car hits the ground?
(b) What is the height of the ledge above the ground?
(c) What is more fundamental: mass or weight?

20. Read the given passage and answer the questions that follow based on the passage and related studied concepts.

A school picnic was organised at Fateh Sagar Lake, Udaipur. Children were allowed to take boat rides. All types of boats can be seen at the lake like small boats, cruise ships and many more. Shilpa found that boats are floating on water where she can also see instructions on board that "Only 8 people are allowed to go on boat ride". She got confused. She asked following questions to her teacher.

(a) How do boats float on water?
(b) Will there be any change in the water level near the boat as people start sitting?
(c) What happens to the boat's buoyant force? Compare the buoyant force acting on boat and water.