

SAMAGRA SHIKSHA, KERALA
SECOND TERM EVALUATION 2022-23
PHYSICS

Standard: IX

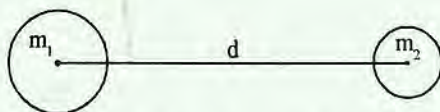
Time : 1½ Hour
 Total Score : 40

Instructions

- First 15 minutes is given as cool off time. This time is to be spent for reading and understanding the questions.
- Answer the questions according to the directions.
- Score is to be considered while answering.

Answer any **Three** questions from 1 to 4 (Each question carries 1 score). (3 x 1 = 3)

1. Find out the relation from the first pair and complete the second pair (1)
 Impulse = Force × Time
 Momentum = _____ × _____
2. Find out the odd one. Write the reason for your inference (1)
 - a. A stretched bow
 - b. A rubber band in stretched position
 - c. Compressed spring
 - d. Water stored in a dam
3. Observe the figure. (1)



What change may happen to the force when the value of m_1 , m_2 and d are doubled?

- a. Doubled
 - b. Halved
 - c. No change
 - d. Reduced to $\frac{1}{4}$
4. The force required to produce an acceleration of 1 m/s^2 on a body of mass 1kg is _____ (1)

Answer any Seven questions from 5 to 13 (Each question carries 2 score). (7x 2= 14)

5. The value of 'g' on earth and moon are different. Compare the weight of a body having mass 100 kg on the surface of earth and moon. (Value of g on earth 9.8 m/s^2 value of g on moon 1.62 m/s^2) (2)
6. Match the following most suitably. (2)

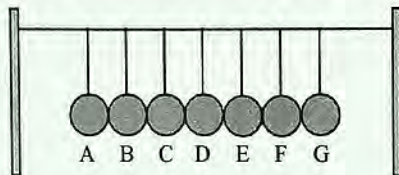
Sl. No.	Equipment	Energy transformation
1	Electric iron box	a. Mechanical energy \rightarrow Electrical energy
2	Electric bulb	b. Electrical energy \rightarrow Heat energy
3	Electric fan	c. Electrical energy \rightarrow Light energy
4	Electric generator	d. Electrical energy \rightarrow Mechanical energy

7. Classify the following instances into inertia of motion and inertia of rest. (2)
- When a running bus stops suddenly, passengers tend to fall forward.
 - A fan continue to rotate for a while even after it is switched off.
 - The mango falls down when branches are shaken.
 - It is possible to strike out a single carrom coin without disturbing others, from a set of coins stacked one over the other.
8. A girl sitting on a chair is trying to lift the same chair by herself. Will it be possible to lift a chair while seated on it.
Justify your answer. (2)
9. Find out the appropriate law for the given situations. (2)
- When the tip of an inflated balloon is released, the balloon moves in a direction opposite to the direction of motion of air.
 - When a bus moves forward suddenly from rest, the standing passengers tend to fall back.
 - During a pole vault jump the impact is reduced by falling on the foam bed.
 - Gas at high pressure pushed out from the chambers of rocket causes rocket propulsion.
10. A body of mass 10000 kg and another body of mass 4000 kg are separated by a distance of 2 m. What is the force of attraction between them? ($G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$) (2)

11. All are aware of Newton's third law of motion.
- When a man jumps from a boat to the shore even though action and reaction are equal and opposite they do not cancel each other, he can jump forward. Explain the reason? (1)
 - If we push a cart on mud, it won't move. What may be the reason? (1)
12. When two boys are pushing the table from opposite sides with equal force, the table continues in its state of rest.
- Which law is associated with this? (1)
 - State the law. (1)
13. A spring balance with a body suspended from it is allowed to fall.
- What will be the reading on the balance during the fall? (1)
 - What do you mean by free fall? (1)

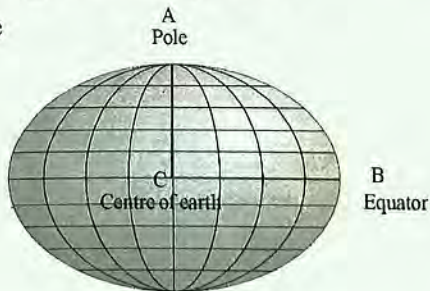
Answer any **Five** questions from 14 to 19 (Each question carries 3 score). (5x 3= 15)

14. Metal balls of same size and mass are arranged as shown in the figure.



- Move the balls A & B slightly back and release it forward to hit C. What happens? (1)
 - Move the balls D, E, F, G slightly back and release it forward to hit C. What happens? (1)
 - Write the law associated with this? (1)
15. Kinetic energy and Potential energy are two types of mechanical energy.
- In which situation a stone of mass 4 kg will possess more energy, when placed at a height of 2 m or when travelling with a velocity of 2 m/s. (3)

16. Observe the figure



Assume that a body of mass 1 kg is kept at three places of earth marked as A, B, C.

- In which place this body experiences maximum weight? (1)
- In which place this body experiences minimum weight? (1)
- Justify your answer. (1)

17. A stone of mass 10 kg is lifted to the second floor which is at a height of 5 m from the ground. It is lifted again to the third floor which is at a height of 3 m from the second floor.

Calculate the potential energy of the stone with respect to the ground. (3)

18. Observe the figure.



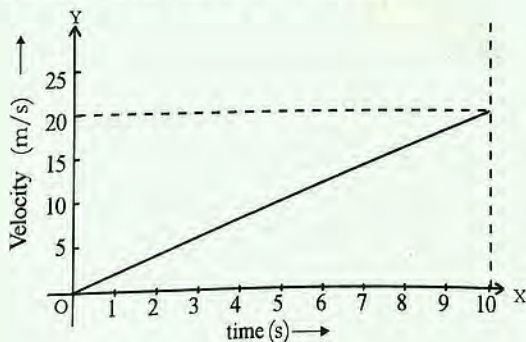
(i)



(ii)

- Name the devices in the figure. (1)
- Which among these devices is used to measure weight of a body? (1)
- What do you mean by one kilogram weight? (1)

19. Velocity - time graph of a moving car of 1000 kg is given.



- Find out the acceleration of the car? (1)
- What is the force experienced by the car? (2)

Answer any Two questions from 20 to 22 (Each question carries 4 score). (2 x 4 = 8)

20. State the reason.

- a. Karate experts move their hands with great speed to break strong bricks. (1)
- b. While catching a cricket ball the player draws his hands backward along with the ball. (1)
- c. A running athlete cannot stop himself abruptly at the finishing line in a race. (1)
- d. It is easy to stop a rolling empty drum. But it is difficult to stop a rolling drum filled with tar. (1)

21. The motion of an object along a circular path is known as circular motion.

- a. What is meant by centripetal acceleration? (1)
- b. A hammer of mass 4 kg is subjected to circular motion along a circular path of radius 2 m with a velocity of 5 m/s. Calculate its centripetal force. (2)
- c. What happens to the hammer which is under circular motion if it loses the centripetal force. (1)

22. Work is said to be done only when a body undergoes displacement in the direction of the applied force.

- a. Write the SI unit of work. (1)
- b. A child is standing with a bag of mass 5 kg. What is the work done against gravitational force? (1)
- c. The same bag is lifted and placed above an almirah of height 2 m by the child. Calculate the work done against gravitational force. ($g = 10 \text{ m/s}^2$) (1)
- d. Find out whether the work done in the following situations is positive or negative.
 - i. What is the work done by the gravitational force on a freely falling body? ($\frac{1}{2}$)
 - ii. The work done by the frictional force exerted on an object moving along a plane surface. ($\frac{1}{2}$)