## SAMAGRA SHIKSHA, KERALA
### Summative Assessment – II Term, 2025 – 26

# PHYSICS

Standard : IX                                           Time : 1½ hour
                                                        Total Score : 40

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**Instructions**
- The first 15 minutes is cool-off time. Use this time to read and understand the questions and plan your answers.
- This question paper has 18 questions in sections A, B, C, and D.
- Choices are provided for questions 6, 9, 14, 15, and 18.
- For the questions that offer a choice, you only need to answer one of the options.

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### Section - A

**Write answer for all questions from 1 to 4. Each question carries 1 score**          (4 x 1 = 4)

1. Light falling from air to water at an angle of $50^0$ with the normal will -          (1)
   a. reflect at an angle of $40^0$ with the normal
   b. refract at an angle more than $50^0$ with the normal
   c. pass without any deviation.
   d. refract at an angle less than $50^0$ with the normal

2. **Statement :** The weight of an object felt at Kochi and Antarctica are the same.          (1)

   **Reason :** The acceleration due to gravity is the same everywhere on Earth.

   (a) Both the statement and the reason are true, and reason is the correct explanation of statement.

   (b) Both the statement and the reason are true, but reason is not the correct explanation of statement.

   (c) Both the statement and the reason are not correct.

   (d) Statement is correct, but reason is not correct.

3. The table shows the gravitational force experienced by an object.

   Match the columns A and B appropriately.

| A | B |
|---|---|
| (i) When one of the massess is doubled without changing the distance. | (x) Force of attraction becomes 4 times |
| (ii) When the distance is doubled without changing the mass. | (y) Force of attraction is doubled |
| (iii) When the distance is halved without changing the mass. | (z) Force of attraction decreased to one - fourth |

   Choose the correct option from the following.

   a) i – y, ii – z, iii - x          b) i – z, ii – x, iii – y

   c) i – x, ii – y, iii - z          d) i - z, ii - y, iii - x          (1)

4. Choose the examples of positive work from the following situations. (1)
    a) Work done by gravity when a mango falls down.
    b) Work done by the buoyant force on a bucket when it is being submerged in water.
    c) Work done by gravity on a bucket when it is being submerged in water.
    d) Work done by the frictional force when objects are moved across a floor.

## Section - B

**Answer questions from 5 to 11. Questions 6 and 9 have choices. Each question carries 2 score**

$$(5 \times 2 = 10)$$

5. Person A applies a force of 500 N on an object. Person B also applies the same force in the same direction on that object.
    a) What is the effective force experienced by the object? (1)
    b) Is it a balanced force or an unbalanced force. Justify your answer. (1)

6 A. The velocity-time graph of a moving car is given below.
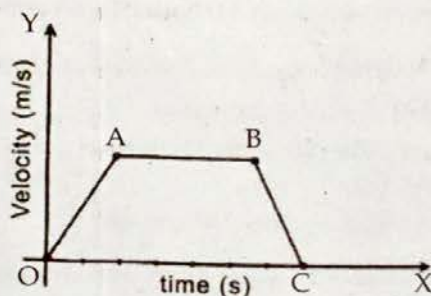


    a) Find the acceleration of the car from A to B. Justify your answer. (1)
    b) Which part of this graph represents the deceleration of the car? Why? (1)

### OR

6 B. Observe the velocity-time graph given below. (2)
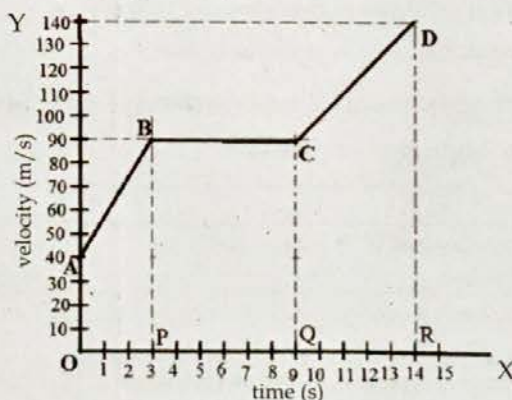


Calculate the displacement of the body during the time in which it is moving with a uniform velocity.

7. A car is negotiating a curve with a constant speed. Is its velocity uniform? Justify your answer. (2)

8. Give reasons for the following.

   a) Accidents that involve passengers who do not wear seat belts are more likely to be fatal. (1)

   b) Cricket players move their hands backward along with the ball while catching a fast moving ball. (1)

9 A. A person pushes a trolley of mass 100 kg by applying a force. The trolley acquires an acceleration of 5 m/s$^2$, and it moves along a straight line through a distance of 16 m. Calculate the work done by him (2)

### OR

9 B. An object of mass 4 kg is at rest. When a force is applied on it, its velocity becomes 20 m/s and is displaced by 40 m.

   Find the amount of work done by the force? (2)

10. Objects may fall down. Some of them may be in free fall.

   a) What do you mean by free fall? (1)

   b) The apparent weight of a freely falling body is zero. Why? (1)

11. A person cycling in a *well of death* is able to maintain that path because of the centripetal force.

   a) What do you mean by centripetal force? (1)

   b) State the direction of velocity of an object undergoing uniform circular motion. (1)

### Section - C

Answer questions from 12 to 17, each question carries 3 score. Questions 14 and 15 have choices.                                                           (6 x 3 = 18)

12. Refractive index of some mediums are given below in the table.

| Medium | Refractive index |
|---|---|
| Crown glass | 1.52 |
| Glycerine | 1.47 |
| Sunflower oil | 1.47 |
| Water | 1.33 |
| Flint glass | 1.62 |

   a) In which medium given in the table does light travel fastest? (1)

   b) A ray of light enters obliquely from sunflower oil to glycerine at an angle 30$^0$. What will be the angle at which it passes through glycerine. Justify your answer. (2)

13. Write down the appropriate law associated with the following situations.

   a) Gases at high pressure coming out from the combustion chambers of rocket causes rocket propulsion. (1)

   b) When a bus moves forward suddenly from rest, the standing passengers tend to fall backward. (1)

   c) During a pole vault jump, the impact on the athlete is reduced by falling onto a foam bed. (1)

**14 A.** The gravitational force on the lunar surface is aproximately 1/6 times that of the Earth.

a) What is the weight of an object on the Earth, if its mass is 18 kg? ($g_{earth}$ = 10 m/s²)  (1)

b) If this object is taken to the surface of the moon, what will be its mass and weight? (2)

**OR**

**14 B.**  a) What is the weight of an object at the centre of the Earth?  (1)

b) What are the factors that influence the weight of an object?  (1)

c) In which region on the surface of the earth does a body experience maximum weight? Give reason.  (1)

**15 A.** An object weighs 0.45 kgwt in air and 0.31 kgwt when fully immersed in water. Find out the following.

a) The loss of weight of the object.  (1)

b) The buoyant force.  (1)

c) Weight of the water displaced.  (1)

**OR**

**15 B.** A ship sinks more when it enters a river from a sea, since the density of river water is lesser.

a) What change occurs in the buoyant force. Explain.  (2)

b) Write down another factor that influences the buoyant force.  (1)

**16.** The sale of milk adulterated with water is a crime. It is also a social menace.

a) Name the device used to measure the relative density of milk.  (1)

b) Write down the working principle of this device.  (1)

c) Name another device working on the same principle.  (1)

**17.** A porter of height 1.5 m lifts a suitcase of mass 15 kg from the ground and places it on his head. What is the work done by the porter against the force of gravity (g = 10 m/s²).  (3)

## Section - D

**Answer any 1 question. Each carries 4 score.**  (4 x 1 = 4)

**18 A.** The velocity of a body of mass 500 g changes from 65 m/s to 5 m/s on applying a force of 20 N. Calculate the time for which the force is applied.  (4)

**OR**

**B.** When a force of 14 N is applied on a body of mass 700 g its velocity changes from 30 m/s to a certain value in 2 s. Calculate the change in velocity of the body.  (4)