

SAMAGRA SHIKSHA, KERALA
Summative Assessment - III 2025 - 26

PHYSICS

Standard: IX

Time : 1½ hour

Total Score : 40

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 5, 11, 12, 14, and 18.
- For the questions with choice, you only need to answer one of the options.

Section - A

Select the correct answer for questions 1 to 4. Each question carries 1 score (4 × 1 = 4)

1. Which of the following statements is related to Total Internal Reflection? (1)
 - a) When a light ray enters from an optically rarer medium into an optically denser medium.
 - b) The angle of incidence is less than the critical angle.
 - c) When light enters from an optically denser medium to an optically rarer medium at an angle greater than the critical angle.
 - d) When A Light ray enters a rarer medium from a denser medium perpendicular to the interface.

2. Statement: A passenger travelling in a moving bus leans forward when the bus stops suddenly.
 Reason : While the upper part of the passenger's body tries to move forward due to inertia, his feet stay at rest along with the bus. (1)
 - a) Both Statement and Reason are correct; the Reason explains the Statement.
 - b) Both Statement and Reason are correct; the Reason does not explain the Statement.
 - c) Statement is correct; Reason is incorrect.
 - d) Statement is incorrect; Reason is correct.

3. Match the following and find the correct option: (1)

Column 1	Column 2
A. Current	1. $V = IR$
B. Ohm's Law	2. Resistance increases
C. Series combination	3. A

- a) A - 2, B - 1, C - 3
- b) A - 3, B - 1, C - 2
- c) A - 3, B - 2, C - 1
- d) A - 1, B - 3, C - 2

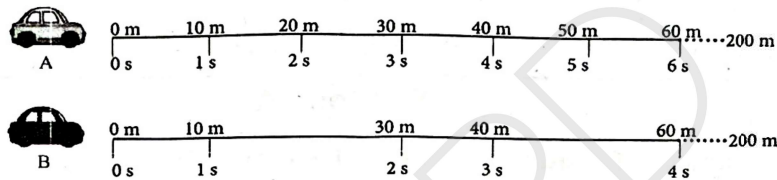
4. Some statements regarding the speed of sound are given: (1)
- Sound travels fastest through liquids.
 - Sound travels fastest through solids.
 - Sound travels fastest through gases.
 - A medium is required for sound to travel.
- Which of the following are correct?

- a) i and iii b) i and ii c) iii and iv d) ii and iv

Section - B

Answer questions from 5 to 11. Questions 5 and 11 have a choice. Each question carries 2 score (7 x 2 = 14)

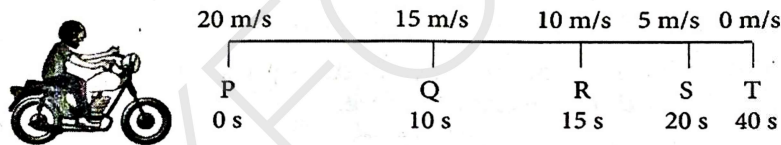
5. A) Data related to two cars, A and B, travelling a distance of 200 m along a straight line path is provided. (2)



What is the difference in their velocities? Explain.

OR

5. B) Data related to the motion of a motorbike is given. (2)



Describe the nature of the acceleration of the motor bike.

6. Two instances where objects possess potential energy are given.

Explain how a coconut on the coconut tree and the compressed spring acquired potential energy.



- a) Coconut on the coconut tree :
- b) Compressed spring :

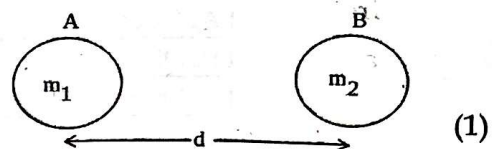
a b

7. Give reasons for the following statements: (2)

- When catching a fast moving ball, in a football match goalkeeper moves his hands backward in the direction of the ball's motion.
- When a person jumps from a boat to the shore, the boat moves backward.

8. The masses of two objects A and B are m_1 and m_2 respectively, and the distance between them is d .

- a) If the mass of A is doubled and the mass of B is halved, what change will occur in the force of attraction between them?



- b) If the distance between A and B is increased 3 times, what change will occur in the force of attraction between them? (1)

9. A potential difference is required between the terminals of a bulb in an electric circuit to make it glow continuously.
- What is meant by potential difference? (1)
 - How is potential difference maintained between two points in an electric circuit? (1)
10. Explain the difference between music and noise with examples. (2)
11. A) A car of mass 1500 kg at rest attains a velocity of 20 m/s in 10 s. Calculate the force applied. (2)

OR

11. B) A force of 50 N is applied to an object of mass 10 kg for 2 s. Determine the change in velocity of the car. (2)

Section - C

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

12. A) The weight of an object on Earth is 150 N. Find its mass. What will be its weight on the Moon? ($g_{\text{Earth}} = 10 \text{ m/s}^2$, $g_{\text{Moon}} = 1.6 \text{ m/s}^2$) (3)

OR

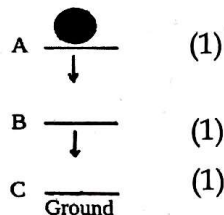
- B) Calculate the weight of an object with a mass of 100 kg at the following locations. ($g_{\text{Earth}} = 10 \text{ m/s}^2$, $g_{\text{Jupiter}} = 23.1 \text{ m/s}^2$).

- Centre of the Earth (1)
 - Polar region (1)
 - Jupiter (1)
13. A hydrometer is an instrument used to measure the relative density of liquids.
- What is meant by relative density? (1)
 - What will be the reading shown by a hydrometer in pure water? (1)
 - If a hydrometer floats higher in a liquid, what can be concluded about the liquid's relative density? (1)
14. A) The amount of work is the product of the applied force and the displacement of the object in the direction of the force.
- When does the amount of work done become 1 J? (1)
 - Calculate the work required to lift a container of mass m kg to a height h meter using a crane. (1)
 - What can be concluded about the work done on an object when its displacement is in the opposite direction of the applied force? (1)

OR

14. B) The figure indicates an object placed at position A at a height from the ground (C). Analyse the following statements regarding the energy change as this object falls freely from A through B to C, and correct them if they are wrong.

- At A, the object possesses kinetic energy.
- When reaching position B, the object's kinetic energy decreases and potential energy increases.
- Upon reaching C, the kinetic energy becomes zero.



15. A battery is made by connecting multiple cells together.
- In which way should 4 identical dry cells be connected to make a 6V battery? (1)
 - Draw the symbol for this battery. (1)
 - What will be the EMF of a single cell in this setup? (1)
16. a) What are the factors that influence the resistance of a conductor? (2)
- b) Rheostats are commonly used in school laboratory experiments to regulate the current. What is the working principle of a rheostat? (1)
17. The ear is the sense organ that helps us to hear sound.
- Which part of the ear vibrates when sound reaches the ear? (1)
 - What are the three factors necessary to experience sound? (1)
 - Write down a few challenges faced by persons with hearing impairment. (1)

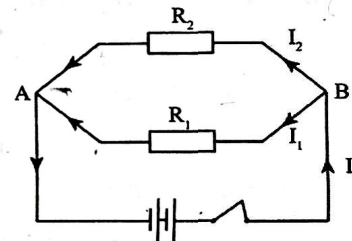
Section - D

Answer any 1 question. Each carries 4 score

(4 x 1 = 4)

18. A) In the figure, resistors R_1 and R_2 are connected to a battery.

- What is the name given to the arrangement of connecting resistors as shown in the figure? (1)
- How will you calculate the total current in the circuit when resistors are connected in this way? (1)
- In which manner electric appliances are connected to the mains of your house? Explain. (1)
- If $R_1 = R_2 = 10 \Omega$, calculate the effective resistance. (1)



OR

18. B) A circuit is provided where three 2Ω resistors are connected to a 6V battery.

- What is the name of the arrangement of resistors connected between points A and B? (1)
- What is the resistance between points A and B? (1)
- Calculate the effective resistance of this circuit. (1)
- What will be the total current in the circuit when the switch is turned on? (1)

