

Motion, Time, Light and Electric Current

Science · Class 7 · Topic-wise Practice Worksheet

TIME 45 minutes	QUESTIONS 18	TOTAL MARKS 24	MAX. SCORE ___ / 24
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Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

- There are **18 questions** in this worksheet. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–15 carry **1 mark** each. Questions 16–18 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Study every diagram and graph carefully.

Section A — Scientific Reasoning

Q1–Q8 · 1 mark each

- The SI unit of speed is _____.
 (A) m/s (B) km/h
 (C) m/s² (D) km
- A body covers equal distances in equal intervals of time. Its motion is said to be _____.
 (A) Non-uniform (B) Uniform
 (C) Circular (D) Random
- The time taken by a simple pendulum to complete one full oscillation is called its _____.
 (A) Amplitude (B) Length
 (C) Frequency (D) Time period
- The image formed by a plane mirror is _____.
 (A) Virtual, erect and of the same size (B) Real, inverted and smaller
 (C) Real, erect and larger (D) Virtual, inverted and smaller
- Which mirror is used as a rear-view mirror in vehicles?
 (A) Plane (B) Convex
 (C) Concave (D) Cylindrical
- A concave mirror is used by dentists because it can form a _____ image of a tooth.
 (A) Diminished (B) Laterally inverted only
 (C) Inverted and real (D) Magnified and erect
- The heating effect of electric current is used in a/an _____.
 (A) Electric iron (B) Electric bell
 (C) Electromagnet (D) Compass
- A fuse wire is made of a material with a _____.
 (A) High melting point (B) Low melting point
 (C) Very high resistance always (D) Magnetic property

9. The distance–time graph shows the journey of a car. What does the flat portion between 20 and 30 minutes represent?

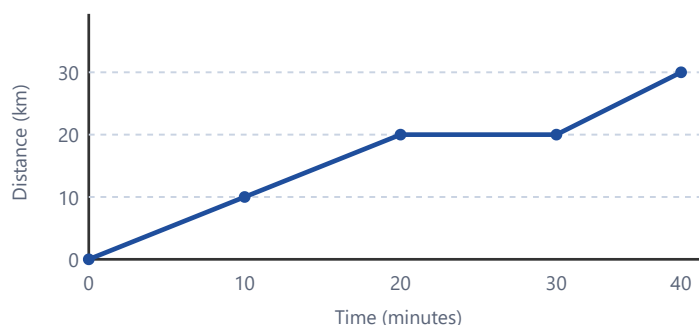


Fig. 9.1 — Distance–time graph for a car journey

- (A) The car is speeding up
(B) The car is moving backwards
(C) The car is at rest
(D) The car is moving at its fastest
10. A train covers 240 km in 3 hours. What is its speed in m/s?
- (A) 80 m/s
(B) 4.4 m/s
(C) 13.3 m/s
(D) 22.2 m/s
11. Why does the word AMBULANCE appear reversed on the front of an ambulance?
- (A) So that a driver ahead reads it correctly in the rear-view mirror
(B) To save paint
(C) To make it look attractive
(D) Because the letters are easier to write that way
12. In the table below, which row is **incorrectly** matched?

Row	Device	Effect of current used
(A)	Electric heater	Heating effect
(B)	Electric bell	Magnetic effect
(C)	Fuse	Magnetic effect
(D)	Electromagnet	Magnetic effect

Table 12.1 — Effects of electric current

- (A) Row (A)
(B) Row (B)
(C) Row (C)
(D) Row (D)
13. A simple pendulum takes 40 seconds to complete 20 oscillations. What is its time period?
- (A) 0.5 s
(B) 2 s
(C) 20 s
(D) 800 s
14. A boy stands 2 m in front of a plane mirror. How far is his image from him?
- (A) 1 m
(B) 2 m
(C) 4 m
(D) 8 m
15. Why should the fuse in a household circuit never be replaced with a thick copper wire?
- (A) Copper is expensive
(B) Copper wire is too short
(C) Copper does not conduct electricity
(D) A thick copper wire will not melt during an overload, so the protection is lost

16. Consider the following statements.

- (i) On a distance–time graph, a straight sloping line means uniform speed.
- (ii) The image in a plane mirror can be caught on a screen.
- (iii) The time period of a pendulum depends on the length of its string.

Which of the statements is/are correct?

- | | |
|------------------------|-------------------------|
| (A) (i) and (ii) only | (B) (ii) and (iii) only |
| (C) (i) and (iii) only | (D) All three |

17. A car travels the first 100 km at 50 km/h and the next 100 km at 100 km/h. What is its average speed for the whole journey?

- | | |
|---------------|-------------|
| (A) 66.7 km/h | (B) 60 km/h |
| (C) 75 km/h | (D) 80 km/h |

18. Why is a convex mirror preferred to a plane mirror for the side mirror of a car, even though it makes objects look smaller?

- | | |
|--|--|
| (A) It is cheaper to make | (B) It gives a much wider field of view, so more traffic can be seen at once |
| (C) It shows objects the right way round | (D) It never gets dirty |

Answer Key

1	A	2	B	3	D	4	A	5	B
6	D	7	A	8	B	9	C	10	D
11	A	12	C	13	B	14	C	15	D
16	C	17	A	18	B				

Solutions

1. Answer: (A) m/s

Speed = distance ÷ time, and in SI units that is metres divided by seconds, so the unit is **m/s**.

2. Answer: (B) Uniform

Covering equal distances in equal times means the speed never changes, which is **uniform** motion.

3. Answer: (D) Time period

The **time period** is the time for one complete to-and-fro swing. For a given pendulum it depends only on the length of the string.

4. Answer: (A) Virtual, erect and of the same size

A plane mirror always forms an image that is **virtual, erect and the same size** as the object, at the same distance behind the mirror. It is also laterally inverted.

5. Answer: (B) Convex

A **convex** mirror always gives an erect, diminished image and covers a wide field of view, so the driver can see much more of the road behind.

6. Answer: (D) Magnified and erect

When the object is close to a concave mirror it forms a **magnified and erect** virtual image, which lets the dentist see the tooth enlarged.

7. Answer: (A) Electric iron

An **electric iron** works because current passing through a high-resistance coil produces heat. An electric bell and an electromagnet use the magnetic effect instead.

8. Answer: (B) Low melting point

A fuse wire has a **low melting point**, so if the current becomes dangerously large the wire melts, breaking the circuit and protecting the appliances.

9. Answer: (C) The car is at rest

On a distance–time graph the distance stops increasing during the flat portion, which means the car is not moving. So **the car is at rest** between 20 and 30 minutes. A steeper line means a greater speed.

10. Answer: (D) 22.2 m/s

Speed = $240 \div 3 = 80$ km/h.

To convert to m/s, multiply by $\frac{5}{18}$: $80 \times \frac{5}{18} = \frac{400}{18} = \mathbf{22.2 \text{ m/s}}$ (to one decimal place).

11. Answer: (A) So that a driver ahead reads it correctly in the rear-view mirror

A plane mirror produces lateral inversion, swapping left and right. Writing the word already reversed means that a **driver ahead reads it the right way round in the rear-view mirror** and can give way at once.

12. Answer: (C) Row (C)

A fuse works by the **heating effect** — a large current heats the thin wire until it melts and breaks the circuit. The other three rows are correct.

13. Answer: (B) 2 s

Time period = total time ÷ number of oscillations
= $40 \div 20 = \mathbf{2 \text{ seconds}}$.

14. Answer: (C) 4 m

A plane mirror forms the image as far behind the mirror as the object is in front — that is 2 m behind.
Distance between the boy and his image = $2 + 2 = \mathbf{4 \text{ m}}$.

15. Answer: (D) A thick copper wire will not melt during an overload, so the protection is lost

A fuse is meant to be the weakest point in the circuit. **A thick copper wire will carry a very large current without melting**, so during an overload the wiring itself overheats and may cause a fire — the whole purpose of the fuse is defeated.

16. Answer: (C) (i) and (iii) only

Statement (i) is true — a constant slope means equal distances in equal times. Statement (ii) is false; the image in a plane mirror is **virtual** and cannot be caught on a screen. Statement (iii) is true; a longer pendulum swings more slowly. Hence **(i) and (iii)**.

17. Answer: (A) 66.7 km/h

Average speed is total distance divided by total time, not the average of the two speeds.

Time for the first part = $100 \div 50 = 2$ h.

Time for the second part = $100 \div 100 = 1$ h.

Total distance = 200 km, total time = 3 h.

Average speed = $200 \div 3 = \mathbf{66.7 \text{ km/h}}$ (to one decimal place).

18. Answer: (B) It gives a much wider field of view, so more traffic can be seen at once

A convex mirror curves outward, so rays from a much larger region reach the eye. It **gives a far wider field of view** than a plane mirror of the same size, letting the driver see more of the road. The trade-off is that objects appear smaller and therefore further away, which is why such mirrors carry a warning.