MAURITIUS
EXAMINATIONS
SYNDICATE

NCE 2025

Science (Physics)

Subject code: N530

EXAMINERS' REPORT

April 2026

INTRODUCTION

The National Certificate of Education (NCE) Assessment, first introduced in 2020-2021, reached its fifth year in 2025.

Science is one of the core compulsory subjects assessed in the NCE Assessment. The NCE Science Assessment is sub-divided into three components: Biology, Chemistry and Physics. This report focuses on the Physics component of the 2025 assessment, identifying frequent errors and challenges faced by candidates. The findings are derived from both a statistical review of a representative sample of scripts and a detailed evaluation of the specific answers provided by the candidates.

The Physics assessment is based on the learning outcomes of the *Science Teaching and learning Syllabus* set at Grade 9. It aims at gauging the extent to which candidates achieve the three Assessment Objectives (AOs) listed in Table 1.

Table 1: Weighting of the Assessment Objectives

	Assessment Objective	**Weighting (%)**
AO1	Knowledge with understanding	45 – 50
AO2	Application	25 - 35
AO3	Scientific Inquiry	20 - 25

GENERAL COMMENTS

Candidates' performance in the 2025 Physics Assessment was good on the whole. An average score of 30.97 out of 50 was achieved – the highest since the NCE Physics Assessment was introduced in 2020-2021.

The Physics assessment effectively gauged the extent to which candidates grasped core principles in Physics and their practical applications. Almost two-thirds of the candidates scored between 30 and 50 marks. This is a clear indication that the question paper was accessible to a large number of candidates. It also suggests good mastery of the basic Physics concepts that were assessed. This report offers valuable information for targeted educational support and highlights both, the broad engagement of the candidates and specific areas where difficulties arose.

Educators are advised to consider the following points in preparing their students for the NCE Physics assessment:

- Require students to show every step of their calculations consistently.
- Help students navigate and overcome linguistic barriers.
- Ensure students write their final answers on the designated answer lines.
- Teach students how to cross out errors neatly and legibly.
- Instruct students to use arrows when replacing previous work/answers.
- Teach students to use rulers and protractors in drawing ray diagrams.
- Inform students that the use rulers and protractors and calculators are allowed in the assessment.

SPECIFIC COMMENTS

Question 1

Question 1, which consisted of 10 multiple-choice items, was found to be easy by a large number of candidates. Nearly all candidates successfully answered items (a) and (b). The majority of the candidates also answered all of the remaining items correctly except for item (i), which was the least well-answered multiple-choice item. Candidates attained a mean score of 8 out of 10 in Question 1.

Table 2 lists the answers to the items.

Table 2: Answer key to the items in Question 1

Item Number	Key	Item Number	Key
(a)	**C**	(f)	**D**
(b)	**B**	(g)	**B**
(c)	**C**	(h)	**B**
(d)	**A**	(i)	**A**
(e)	**D**	(j)	**C**

Item (a)

Which physical quantity is measured using a balance?

A Diameter

B Length

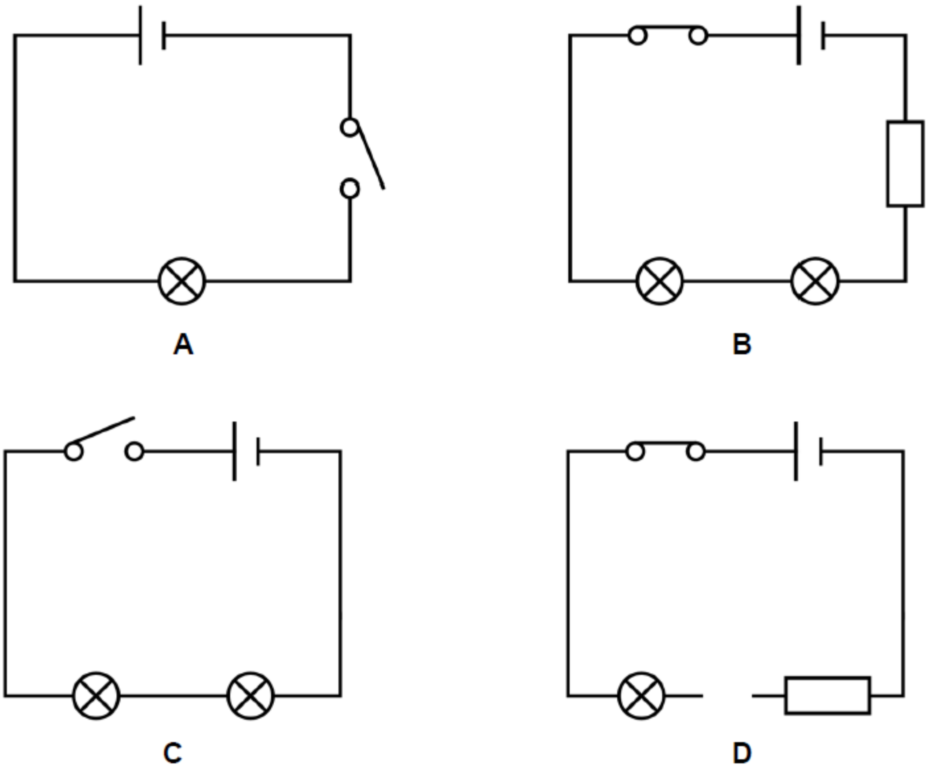
C Mass

D Temperature

This item focused on identifying the appropriate instrument for measuring one of the basic physical quantities, mass. The data indicates that the vast majority of candidates could identify measuring instruments with confidence.

Item (b)

Which of the following circuit diagrams shows a closed electric circuit?



Candidates were competent at interpreting simple circuit symbols and at distinguishing between open and closed switches in general.

Item (c)

Fig. 1.1 shows some liquid in a measuring cylinder.

Circle the letter which shows where the line of sight should be aligned for an accurate measurement.

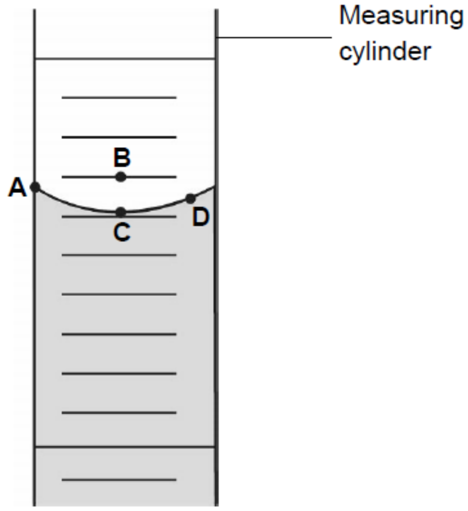
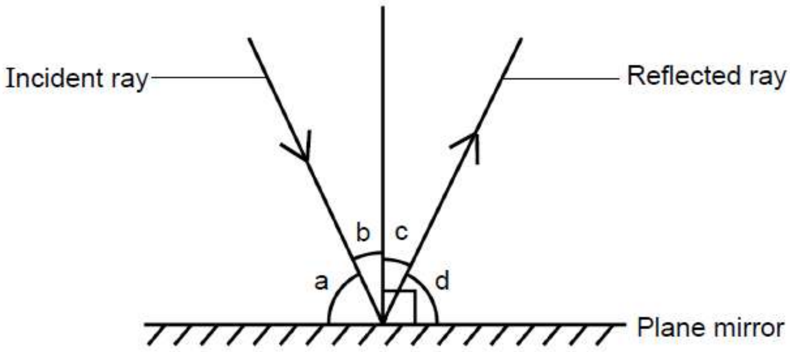


Fig. 1.1

Many correctly identified the correct eye position on this 2D-diagram. To ensure that students develop the skills to avoid parallax error in a lab setting, however, it is essential to encourage small group practical exercises where students take real, physical measurements.

Item (d)

Fig. 1.2 shows the reflection of a ray of light by a plane mirror.



Which pair of angles are equal?

A b and c

B b and d

C a and b

D a and c

The vast majority of candidates successfully identified the angle of incidence (*b* in this case) and the angle of reflection (*c* in this case). Their performance in this item also suggests that a large number of candidates acquired knowledge of the fundamental rule: the angle of incidence is equal to the angle of reflection ($b = c$).

Item (e)

Which of the following is the **most reasonable** estimate of the height of a pupil's school desk?

A 0.08 cm

B 0.8 cm

C 8 cm

D 80 cm

Most of the candidates answered this question correctly. It shows that candidates developed a healthy "common sense" regarding physical scales. However, about a tenth of the candidates chose option ***C** as their correct answer. This suggests a lack of concrete mental image of what a centimeter actually represents. If students hold a 30 cm ruler in their hands, they would instantly see that the height of a desk is much taller than 8 cm. Regularly requiring students to estimate lengths or distances without using a ruler will force them to build a "mental yardstick" and will likely help them make better sense of their physical realities.

Item (f)

Which of the following is luminous?

A Gold

B Moon

C Rock

D Sun

Candidates had no difficulties in identifying the *Sun* as the luminous object.

Item (g)

Fig. 1.3 shows the motion of an object for a period of 10 s.

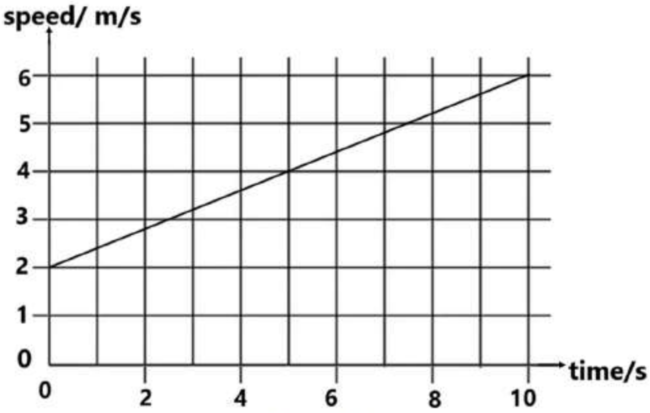


Fig. 1.3

What is the speed of the object at 5 s?

A 7.5 m/s

B 4.0 m/s

C 2.5 m/s

D 0.0 m/s

A large number of candidates correctly identified option **B** as the answer. This shows that many acquired basic graph reading skills. It is worth noting, however, that options **A** and **C** attracted an equal number of candidates. It is reasonable to assume that candidates who chose option **A** mistook the value of 5 on the speed axis for the value 5 on the time axis. Candidates who chose option **C** rightly recognised that the speed-time graph showed an acceleration and went on to calculate the gradient of the graph rather than just reading the speed from the graph.

Item (h)

A car increases its speed from 20 m/s to 60 m/s in 5 s.

What is the acceleration of the car?

A 4 m/s^2

B 8 m/s^2

C 12 m/s^2

D 16 m/s^2

Candidates performed well on item (h). Many recalled and applied the formula: a = (v – u)/t correctly.

Item (i)

What is the energy transformation that takes place in a thermal power station?

A Chemical energy → Heat energy → Kinetic energy → Electrical energy

B Heat energy → Chemical energy → Kinetic energy → Electrical energy

C Electrical energy → Kinetic energy → Heat energy → Chemical energy

D Kinetic energy → Heat energy → Chemical energy → Electrical energy

Item (i) proved to be the most challenging multiple-choice item for candidates. Many chose option **B**. This is possibly because the term "*Thermal Power Station*" instinctively prompted them to select "*Heat energy*" as the starting point, neglecting the chemical energy stored in the fuel. Furthermore, the transition from heat to kinetic energy was likely too abstract for many who could not visualise the process of boiling water into high-pressure steam to spin a turbine. Consequently, those who did not realise that the turbine's physical motion is what powers the generator omitted the "Kinetic energy" stage entirely.

Item (j)

What is the unit of resistance?

A coulomb (C)

B joule (J)

C ohm (Ω)

D volt (V)

Item (j) was fairly straight-forward for a considerable number of candidates, showing that they had a fairly good grasp of the various units used for electrical quantities.

Question 2

Question 2 carried a total of 7 marks. It assessed candidates' understanding of measuring time using a simple pendulum. In general, candidates did not fare very well on this question. Few were able to score the maximum marks. The mean score achieved was 3 out of 7.

Question 2(a)

Define the time period of a simple pendulum.

....

.... [1]

Less than half of the candidates could successfully define the time period of a simple pendulum. In many cases, candidates described what an oscillation is rather than defining the time period. Moreover, candidates' responses often revealed flawed understanding of what an oscillation is.

It is important to highlight that reinforcing concepts of time period and oscillation in the classroom is only possible if activities move students from passive observation to active hands-on measurement.

Question 2(b)(i)

Fig. 2.1 shows a stopwatch.

(i) What is the time shown on the stopwatch, in seconds?

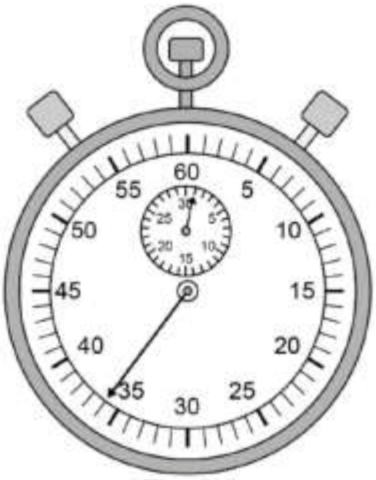


Fig. 2.1

This part question proved difficult for a good number of candidates. The most common incorrect answer was *36 s* which arose from ignoring the minute dial. Some candidates lost partial marks for incorrect conversion of their time into seconds. There was evidence that some candidates misinterpreted the small dial scale in particular.

Each graduation on the small dial represents 1 minute. It was quite common for candidates to read this scale as *31 s* instead of 1 minute. Some also read it as *31 minutes* overlooking the fact that this time is unrealistic considering that it showed the time for a simple pendulum to complete 30 oscillations. It is important to note that some candidates could not score partial marks because they did not show any working.

It will be helpful to provide opportunities to students to record the time of given activities in class using real stopwatches so that they become more engaged and active in practising how to measure time. Alternatively, designing and creating stopwatches using paper plate crafts can greatly enhance students' ability to read and make sense of scales on the minute and second dials.

Question 2(b)(ii)

> The time shown in Fig. 2.1 is the time taken for a simple pendulum to make 30 complete swings.
>
> Calculate the time period of the pendulum.

Performance in Qu. 2(b)(ii) was slightly better than in Qu. 2(b)(i) because candidates recognised that, to calculate the time period, they had to divide the time shown on the stopwatch by 30. A non-negligible number of candidates did the opposite, however. They divided 30 by the time shown on the stopwatch instead, which is a common mistake among students in general.

Question 2(b)(iii)

> Give one precaution that should be taken when using the stopwatch.

Few candidates were able to answer this question correctly. Very often, candidates' responses related to precautions that are taken when using a simple pendulum in a lab setting rather than when using the stopwatch (e.g.: **use of fiducial marks*, **repeat experiment and average total time taken for 30 oscillations*, **time several oscillations* etc.). Expected answers included: *checking for any zero errors before using the stopwatch or avoiding parallax error when reading the scales of the stopwatch*.

Answers: ***2(b)(i)*** *96 s,* ***2(b)(ii)*** *3.2 s*

Question 3

Question 3 was the least well-answered question in the paper. The mean score for the question was 1.8 marks out of a total of 5 marks. The question was focused on the characteristics of an image formed in a plane mirror. A considerable number of candidates did not score any mark.

Question 3(a)

A girl stands in front of a plane mirror at a distance of 120 cm. A photo frame hangs on a wall 210 cm behind her, as shown in Fig. 3.1.

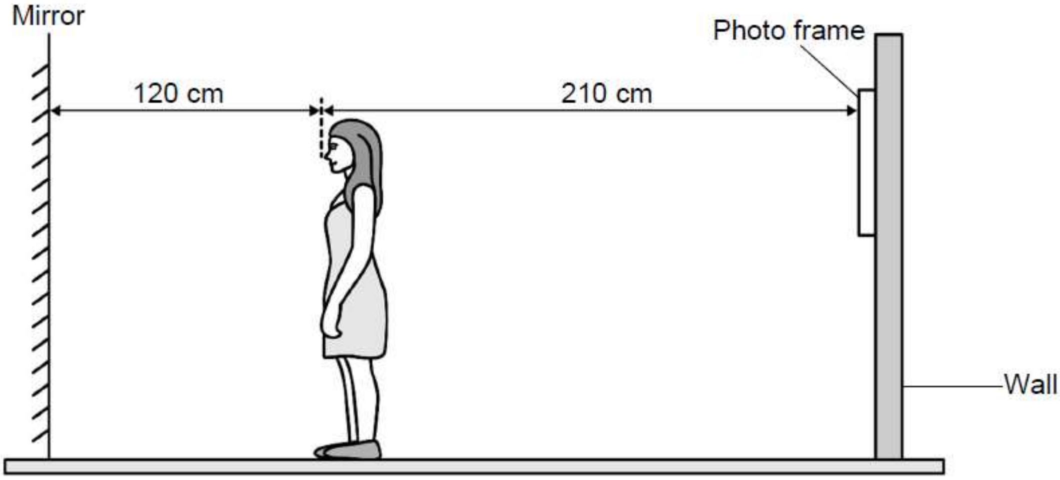


Fig. 3.1

(a) The girl raises her right arm.

Explain why her left arm appears to be raised in the mirror.

A significant number of candidates could not recall the term "lateral inversion" and struggled to explain lateral inversion in their own words. While easy to observe, the concept of lateral inversion is quite difficult to explain. A common misconception is that mirrors flip things *"left to right"* when, in fact, they flip "*front to back"*. It seemed difficult for candidates to understand that for every point on the girl, its image is formed at an *equal distance behind the mirror*. Because the right hand is on one side of her body, its image remains on that same side of the "image space". But, because the image is facing the opposite direction of the girl, that side becomes the "left" side of the person in the mirror – a point that needs to be reinforced in class.

Question 3 (b)

Give **two** other characteristics of an image formed in a plane mirror.

This part question was relatively more accessible to candidates. However, some did not recall the technical terms such as "*upright"* and "*virtual"*. Consequently, they again tried to explain those in their own words. Common mistakes in so doing were to use inappropriate words randomly:

- **It is identical*
- **It is up*
- **It is inverted*
- **It cannot be seen*

Question 3 (c)

What is the distance between the girl and the image of the photo frame she sees in the mirror?

Few candidates obtained the correct answer to part (c). The low success rate arose from three common mistakes identified:

1. Many candidates doubled the distance between the girl and the mirror, which is equivalent to finding the distance to her *own image* rather than to the image of the photo frame.
2. Some just added the two numbers provided in the diagram, which is only the distance from the mirror to the frame.
3. Candidates often overlooked that viewing happens through the mirror and did not realise that light has to travel from the frame, hit the mirror, and bounce back to the girl's eyes.

By treating the mirror as a **midpoint** rather than a starting line, students can avoid the common pitfalls of this classic physics problem.

Answer: ***3(c)*** *210 + 120 + 120 = 450 cm*

Question 4

Candidates fared quite well in this question. They attained a mean score of 11 out of a total of 13 marks.

Question 4 (a)

Table 4.1 lists some sources of energy.

(i) Put a tick (✓) beside all the **non-renewable** sources of energy in Table 4.1.

Table 4.1

Energy sources	Non-renewable (✓)
Diesel	
Wind	
Sun	
Coal	

[2]

(ii) Give one advantage of using renewable sources of energy to produce electricity.

.... [1]

The vast majority of candidates answered Qu. 4(a)(i) correctly. It shows that candidates could confidently differentiate renewable from non-renewable sources of energy. A large number of candidates also successfully answered Qu. 4(a)(ii) although responses provided were sometimes worded clumsily.

Question 4(b)

Match each statement in **Column A** to its corresponding form of energy in **Column B**.

Column A			Column B
Energy due to motion	•	•	Potential energy
Energy produced by a vibrating guitar string	•	•	Light energy
Energy stored in a compressed spring	•	•	Heat energy
Energy that enables us to see	•	•	Kinetic energy
		•	Sound energy

Question 4(b) was straightforward. Almost all the candidates successfully completed the matching question. Their performance indicates a firm grasp of how different forms of energy manifest in real-world scenarios.

Question 4(c)

Which **two** physical quantities listed below are required to calculate gravitational potential energy? Tick (✓) the correct boxes.

☐ Mass

☐ Speed

☐ Time

☐ Height

A large number of candidates recognised that gravitational potential energy is dependent on mass and height. Some candidates wrongly chose speed and mass.

Question 4(d)(i)

Fig. 4.1 shows four identical empty bags **W**, **X**, **Y** and **Z** placed on a rack in a classroom.

Which of the bags **W**, **X**, **Y** or **Z** has maximum gravitational potential energy?

.... [1]

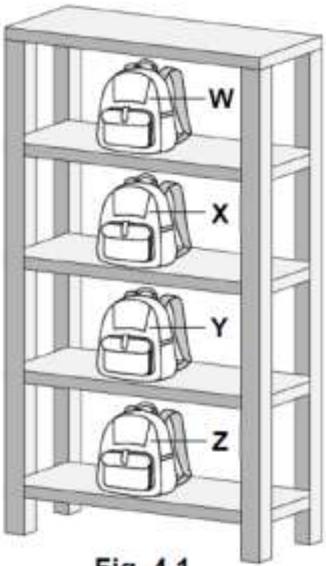


Fig. 4.1

Qu. 4(d)(i) confirmed that candidates had a good grasp that gravitational potential energy is the energy a body possesses by virtue of its position above the ground.

Question 4(d)(ii), (iii), (iv)

Tick (✓) the correct boxes.

What happens to the gravitational potential energy (GPE) of bag **Y** when it is moved and placed next to bag **X**?

☐ It increases. ☐ It remains unchanged. ☐ It decreases.

Give a reason for your answer in part (d)(ii).

Bag **W** falls on the ground.
What is the value of its gravitational potential energy (GPE) when it is on the ground? .... J [1]

Candidates fared equally well in these part questions. Nevertheless, some struggled to explain that the increase in the gravitational potential energy as bag **Y** is placed next to bag **X** is due to the fact that bag **X** was at a higher position above the ground than bag **Y**. A few candidates did not answer part (d)(iv).

Answers: ***Qu. 4(c)*** *mass, height,* ***Qu. 4(d)(i)*** ***W****,* ***Qu. 4(d)(ii)*** *It increases*

Qu. 4(d)(iv) *0 J*

Question 5

Candidates' performance in Question 5 was good. Question 5 was based on the interpretation of a given speed-time graph. Out of a total of 7 marks, candidates achieved a mean score of 3.81.

Question 5 (a)

Fig. 5.1 shows the motion of a car during a given period of time.

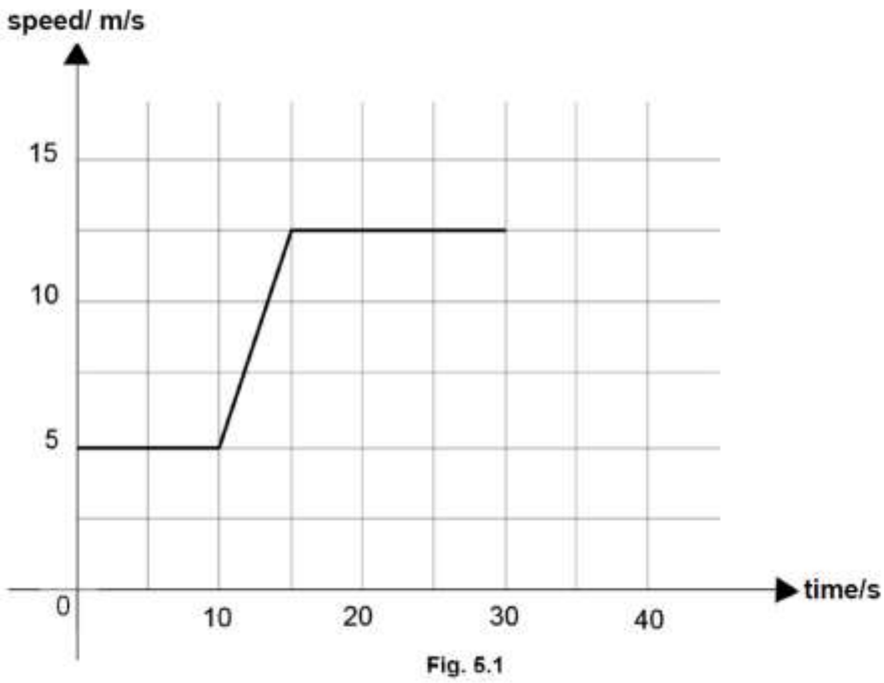


Fig. 5.1

(a) At what time does the car start to accelerate?

(b) For how long does the car accelerate?

Candidates performed well in these part questions. The majority identified that a change in the gradient (from flat to sloped) represented the onset of acceleration in part (a). Thereon, reading the time from the time axis was not a challenge. A large number of candidates also recognised that the car accelerated for 5 s which suggests that the scale used was within the reach of most.

Answers: ***(a)*** *10 s,* ***(b)*** *5 s*

Question 5(c)

> After 30 s, the car decelerates uniformly to rest in the next 5 s. Show this motion on the graph. [2]

Less than half of the candidates earned full marks in this part question. While most knew that uniform deceleration requires a downward-sloping straight line, many struggled with the following:

1. **Timing:** Many did not end their slope exactly at the 35 s mark on the time axis.
2. **Stopping:** A significant number didn't show the car coming to a complete rest, meaning their lines didn't actually reach the time axis.

Using the above "errors" in class and having students play examiners will force them to analyse and identify misconceptions, reinforcing their ability to interpret and read speed-time. Providing opportunities to read graphs with unusual scales will further build their capacity to tackle graph problems more confidently in the future.

Question 5(d)

> For how long does the car move at constant speed during its journey?

This was the least well-answered item in Question 5. While most identified that a horizontal line on a speed-time graph indicates constant speed, they often failed to spot that this occurred twice. Consequently, many mistakenly gave **10 s* or **15 s* as the answer. Additionally, some misinterpreted "during its journey" and incorrectly gave **30 s*.

Question 5(e)

> What is the maximum speed reached by the car during its journey?

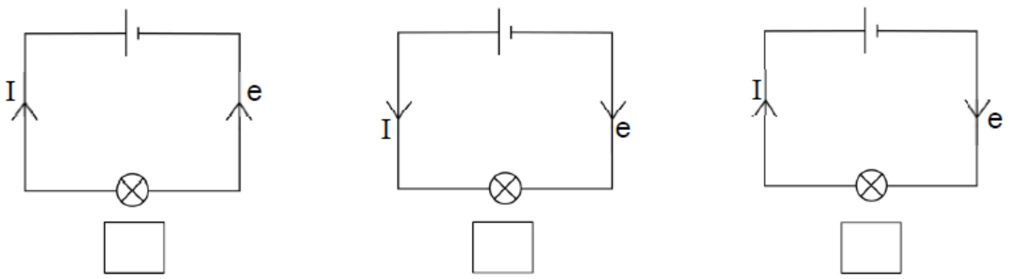
Performance in this part question was below expectation. Only 9 out of 20 candidates found the correct answer. This emphasises the need for more classroom practice focused on improving students' graph-reading skills.

Answers: ***(d)*** *25 s,* **(e)** *12.5 m/s*

Question 6

Question 6 focused on the topic '*Electricity*'. It carried a total of 8 marks. Candidates' performance in Qu. 6 was low and comparable to their performance in Qu. 2. A mean score of 3.5 out of 8 was achieved.

Question 6(a)

> Tick (✓) the circuit diagram showing the correct direction of the conventional current, I and the flow of electrons, e.
>
> 
>
>
> [1]

Only a handful of candidates successfully identified the second circuit diagram as the correct one. The low success rate suggests the following possible misconceptions on the part of candidates:

- Assuming that "current" and "electrons" are the same thing and overlooking that the two flow in opposite directions.

- Mistaking the battery terminals – assuming that the long line represents the negative (-) terminal and the short line represents the positive (+) terminal.
- Looking at the arrows in isolation. To get the correct answer, candidates had to mentally "drive" the charge from the starting terminal, through the bulb, and back to the other terminal to see which way the arrow should point at that specific location in the wire.

Question 6(b)

A student sets up an electric circuit as shown in Fig. 6.1 to determine the resistance of a lamp.

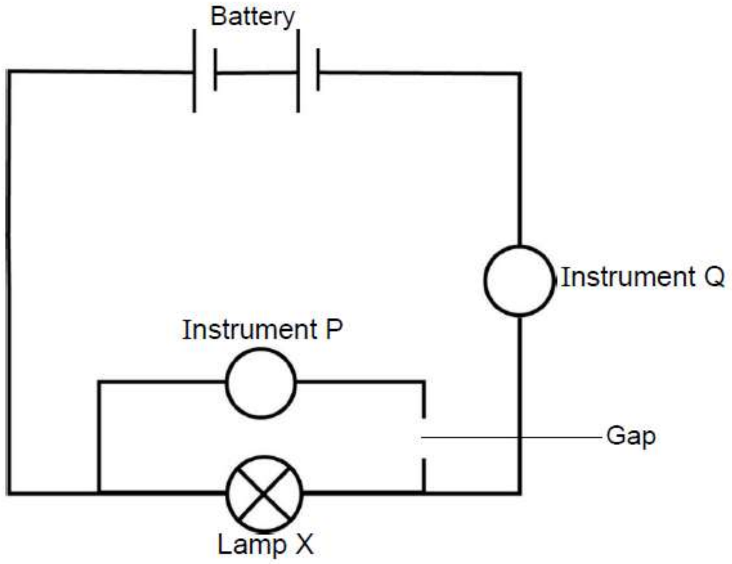


Fig. 6.1

(i) What is the function of the battery in the circuit?

(ii) P and Q are two measuring instruments.
Identify and name each instrument.

(iii) Which physical quantity does instrument Q measure?

(iv) Will lamp X in Fig. 6.1 light up? Explain why.

A large number of candidates identified the battery as the source of energy in the circuit. However, only two fifths of the candidates correctly identified instruments P and Q as the voltmeter and ammeter respectively. Consequently, about the same number of candidates recognised that Instrument Q measured the amount ofcurrent flowing in the circuit. Part (iv) of this question proved challenging for the majority of candidates. About a quarter of the candidates recognised that the gap would not affect the lighting of the bulb which formed part of a complete circuit.

Question 6(c)

In a given circuit, a current of 3 A flows in a resistor. Calculate the amount of charge that flows in the resistor in 2 s. Show all your workings.

A good number of candidates recalled the formula, $Q = It$, and could perform the calculations. However, candidates' responses showed that a significant number still struggle to grasp how the variables actually relate to one another. This suggests that rote memorisation of an equation does not automatically lead to a reinforced understanding of current as the rate of flow of charge. The converse is also true. Knowing a definition by heart does not necessarily imply that students can translate it into a relevant mathematical equation. It appears that students treat definitions and formulas as unrelated facts. They miss the learning opportunity to see how mathematics represent the physical world. By helping students bridge the gap between words and equations, we can deepen their understanding and build their confidence in solving problems more competently.