آغا خان یونیورسٹی ایگزامینیشن بورڈ

AGA KHAN UNIVERSITY EXAMINATION BOARD

Notes from E-Marking Centre on SSC-I Physics Annual Examinations 2024

Introduction

This document has been produced for the teachers and candidates of Secondary School Certificate (SSC) Part I Physics. It contains comments on candidates' responses to the 2024 SSC Part I Examination, indicating the quality of the responses and highlighting their relative

E-Marking Notes

This includes overall comments on candidates' performance on every question and *some* specific examples of candidates' responses which support the mentioned comments. Please note that the descriptive comments represent an overall perception of the better and weaker responses as gathered from the e-marking session. However, the candidates' responses shared in this document represent some specific example(s) of the mentioned comments.

Teachers and candidates should be aware that examiners may ask questions that address the Student Learning Outcomes (SLOs) in a manner that requires candidates to respond by integrating knowledge, understanding and application skills they have developed during the course of study. Candidates are advised to read and comprehend each question carefully before writing the response to fulfil the demand of the question.

Candidates need to be aware that the marks allocated to the questions are related to the answer space provided on the examination paper as a guide to the length of the required response. A longer response will not in itself lead to higher marks. Candidates need to be familiar with the command words in the SLOs which contain terms commonly used in examination questions. However, candidates should also be aware that not all questions will start with or contain one of the command words. Words such as 'how', 'why' or 'what' may also be used.

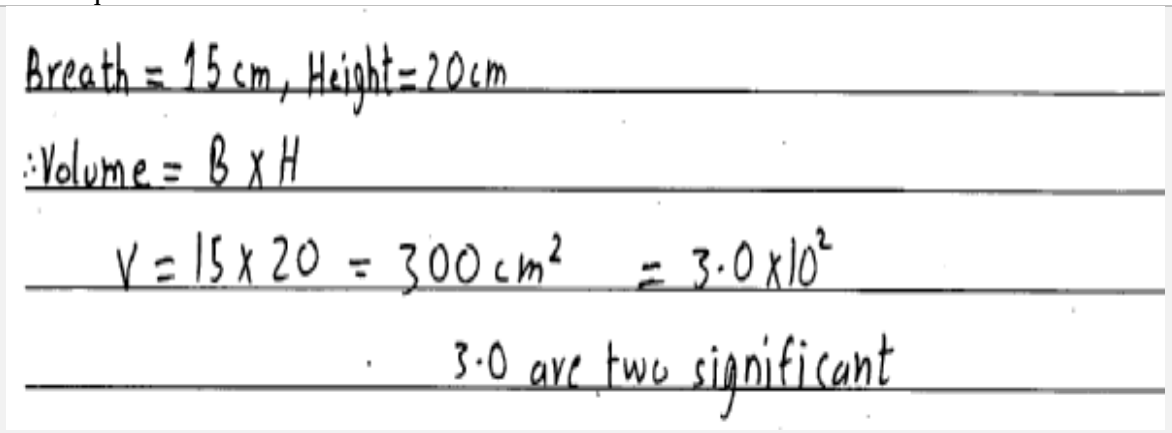
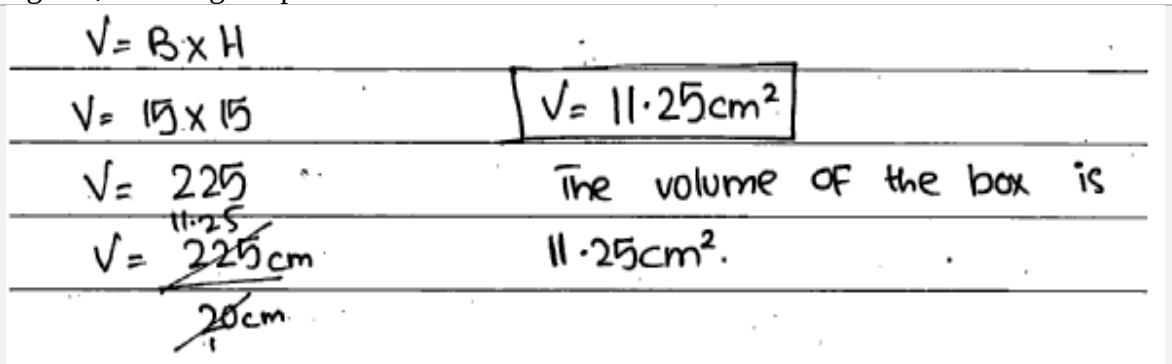
General Observations

Generally, candidates performed well in terms of clarity, accuracy and demonstrating a solid understanding of the concepts. They used command words effectively, answering the questions as required (e.g., explaining, calculating, or comparing). The responses were crisp and to the point, directly addressing what was asked and a good grasp of the questions, which is reflected in their performance on questions related to Pascal's law, work-energy, momentum, radiation and dynamics, whereas certain areas need improvement such as questions based on significant figures, graphs (kinematics) and concept of stability. Responses in these topics may have been incomplete or lacked sufficient detail, suggesting that candidates were less confident or less knowledgeable in these topics. There may have been issues with the correct interpretation and use of command words, leading to responses that did not fully meet the requirements of the questions. Some answers might have included irrelevant information from the main point, indicating a lack of clear understanding or focus.

Note: Candidates' responses shown in this report have not been corrected for grammar, spelling, format or factual information.

DETAILED COMMENTS

Constructed Response Questions (CRQs)

Question No. 1	
Question Text	An online purchasing company delivered a fragile item to its customer in a triangular box. The breadth and height of the box was 15 cm and 20 cm respectively. Calculate the volume of the triangular box upto two significant figures. (**Note**: Volume (V) = Breadth × Height)
SLO No.	1.7.3
SLO Text	Apply the rules for rounding a number to given number of significant figures to solve problems.
Max Marks	02
Cognitive Level	A*
Checking Hints	1 mark for writing the correct answer 1 mark for writing the correct answer to the two significant figures
Overall Performance	Mastering significant figures is part of developing strong scientific and mathematical skills. Overall, responses varied in finding the volume and converting it to two significant figures. Strong answers accurately calculated the volume and correctly applied rounding rules, demonstrating a solid understanding of significant figures and precision.
Description of Better Responses	*Better responses* demonstrated a clear understanding of how to find the volume and then convert the answer into two significant figures. Candidates accurately calculated the volume as per the given formula and effectively rounded their results to the correct number of significant figures, showing attention to detail and precision. The majority of answers were well-structured and followed the correct methodology for significant figure conversion, reflecting excellent work in combining accurate calculations with proper rounding techniques.
Image of Better Response	
Description of Weaker Responses	*Weaker responses* lacked accuracy in either finding the volume or converting the result into two significant figures. Some candidates made errors in their calculations, for example in mathematical manipulation and articulation or struggled with the rounding process, leading to incorrect or imprecise answers. Several responses did not follow the rules for significant figures, affecting the precision of the result.
Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	Preferred Pedagogy** Used for this SLO	Assessment Strategies
• Identify the expectation of command words (use Command Word Guide) • Ensure the content is taught at the relevant cognitive level • Identify necessary content required (skills + concepts) • Review past paper questions on the concept • Utilise the resource guide for additional materials	• Story Board • Cause and Effect • Fish and Bone • Concept Mapping • Audio Visual Resources • Think, Pair and Share • Knowledge Platform videos • Questioning Technique (Socratic approach) • Practical Demonstration ** For description of each Pedagogy, refer to Annexure A	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform https://akueb.knowledgeplatform.com/login
Any Additional Suggestion: Subject teachers must focus carefully the performance of their students in calculations and correctly applying the rules for significant figures to ensure accuracy in both the volume determination and the rounding process.		

*K = Knowledge U = Understanding A = Application and other higher-order cognitive skills

Question No. 2	
Question Text	A hanging picture frame is in a state of static equilibrium. The picture frame has a mass of 0.3 kg and is suspended from a single point by a thin wire.  If a small object of 0.1 kg is hung at any one corner from the bottom of the picture frame, then explain how the addition of the small object affects the balance of these forces and the stability of the picture frame.
SLO No.	4.5.4
SLO Text	Explain different conditions of equilibrium with examples.
Max Marks	03
Cognitive Level	U
Checking Hints	1 mark for writing each point (3 required)

Overall Performance	Overall, responses varied in explaining the effects of hanging a small weight on one corner of a picture frame in static equilibrium. Some candidates effectively described how adding weight shifts the frame's centre of gravity, leading to a tilt towards the weighted corner and affecting its stability. These responses demonstrated a solid understanding of static equilibrium principles. However, some responses lacked clarity or detail about how the weight influences the frame's position and stability and failed to accurately describe the changes in equilibrium.
Description of Better Responses	*Better responses* effectively addressed the impact of hanging a small weight on one corner of the picture frame in static equilibrium. They clearly explained that adding weight to one corner would shift the frame's centre of gravity, potentially causing it to tilt towards that corner and affecting its stability. Their detailed analysis of how the frame's equilibrium is disturbed and the explanations of the resulting changes in position and stability were both accurate and insightful.
Images of Better Responses	The picture frame is in static equilibrium as its centre of gravity is in the middle making it balance. If a small object is hung at any corner, it will change its position making it a slightly tilted. Thus, it will make it unbalance. Its centre of gravity will change affecting the stability of the picture frame.
Description of Weaker Responses	*Weaker responses* struggled to adequately explain the effects of hanging a small weight on one corner of the picture frame in static equilibrium. Several responses lacked detail on how the addition of weight affects the centre of gravity and stability of the frame. Additionally, a few candidates were unclear about how the frame's position would change or how its equilibrium would be disturbed. Moreover, some candidates incorrectly stated that adding weight would not impact the object's stability. Others provided irrelevant answers by assuming the scenario involved a pulley system, due to the presence of a string, and focused on calculating acceleration and tension, which was not related to the question. Some candidates also applied Newton's law of gravitation in their explanations, which was not relevant to the question.
Images of Weaker Responses	$a = \frac{m_1 - m_2}{m_1 + m_2} g$ $a = \frac{0.3 - 0.1}{0.3 + 0.1}$ $a = 0.5 m/s^2$ $a = \frac{0.2}{0.4}$ $T = \frac{2m_1m_2}{m_1 + m_2}$ $T = \frac{2(0.3)(0.1)}{0.3 + 0.1} g$ $T = 0.15N$ $T = \frac{0.06}{0.4}$

Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	Preferred Pedagogy Used for this SLO	Assessment Strategies
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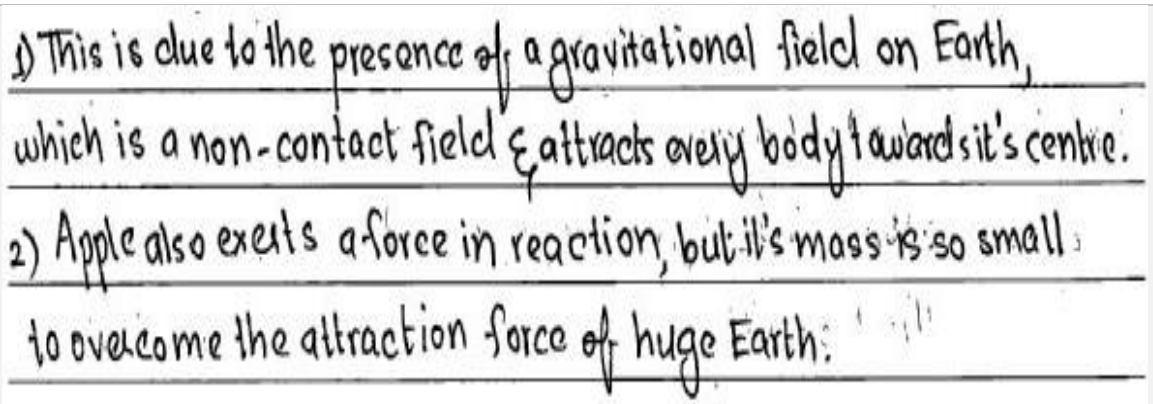
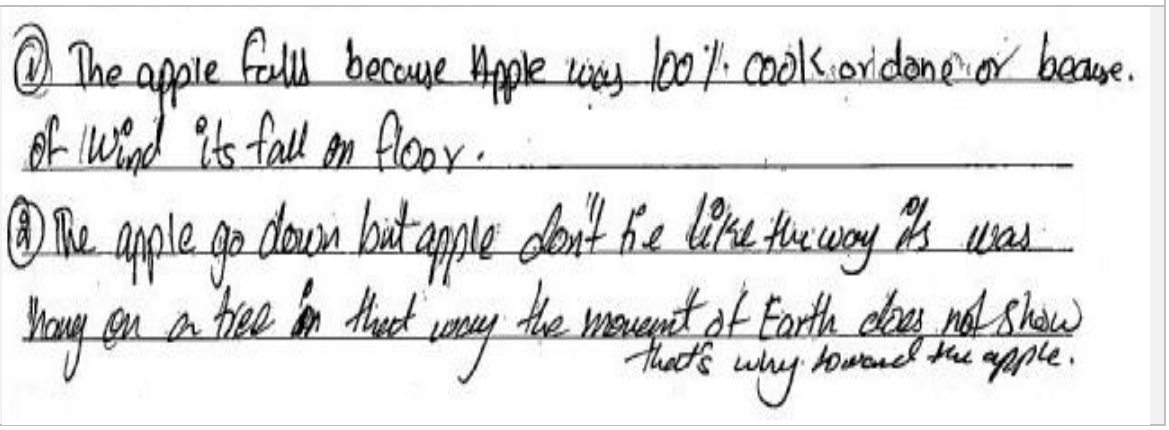
Any Additional Suggestion:

Using more teaching pedagogies with daily life examples can help deepen students' understanding of how hanging weight on one corner of a picture frame affects its position and stability. This approach can also improve their grasp of basic physics principles related to equilibrium and the centre of gravity.

Question No. 3	
Question Text	An apple falls on Earth due to the Earth's attraction force. However, the Earth does not show movement towards the apple. Describe the given phenomenon in TWO points.
SLO No.	5.1.2
SLO Text	Explain that the gravitational forces are consistent with Newton's third law.
Max Marks	02
Cognitive Level	U
Checking Hints	1 mark for writing each highlighted point (2 required)
Overall Performance	The overall response to this question varied in explaining why an apple falls toward the Earth while the Earth appears stationary. Some responses effectively addressed the concepts of gravity and the relative masses of the Earth and the apple, explaining how the Earth's large size results in minimal movement compared to the apple. These responses demonstrated a solid understanding of the principle involved. However, few responses lacked detail and clarity, struggling to adequately explain the role of gravity and the impact of mass on movement.
Description of Better Responses	In *better responses*, candidates demonstrated a solid understanding of the concept by clearly explaining gravity and Newton's third law of motion. They highlighted how the Earth's enormous size causes its movement in response to the apple's gravitational pull to be minimal. Their clear and detailed answers demonstrated a strong grasp of the underlying physics and provided a thorough understanding of the interaction between gravitational forces and object masses. Some of responses also highlighted mass difference, gravitational force and inertia in their answers.

Image of Better Response	
Description of Weaker Responses	*Weaker responses* had difficulty adequately explaining why the apple falls toward the Earth while the Earth appears stationary. Many lacked detail and clarity regarding gravity's role and the significance of the relative masses of the Earth and the apple. Some candidates failed to address how the Earth's large mass results in minimal movement compared to that of the apple.
Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	**Preferred Pedagogy Used for this SLO**	**Assessment Strategies**
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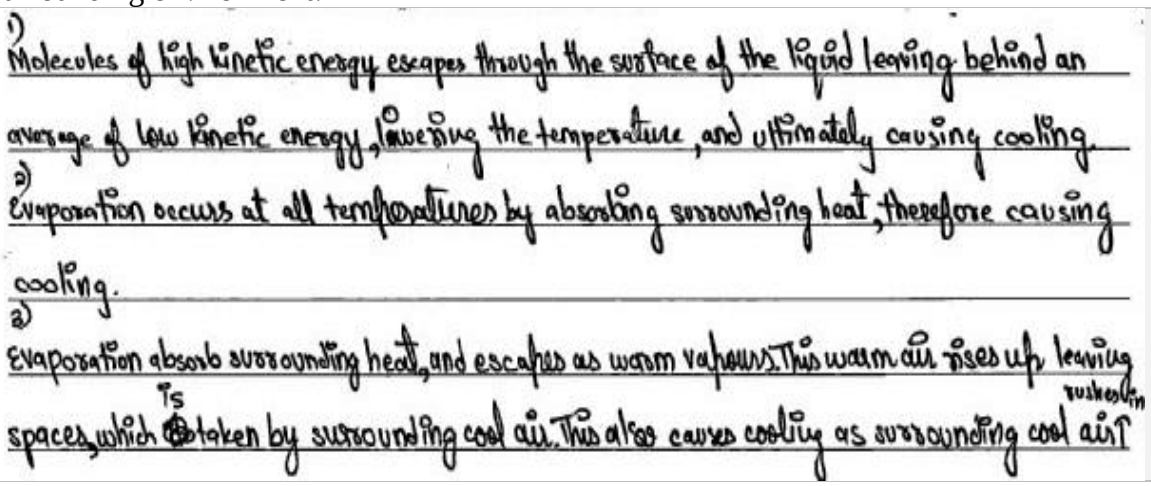
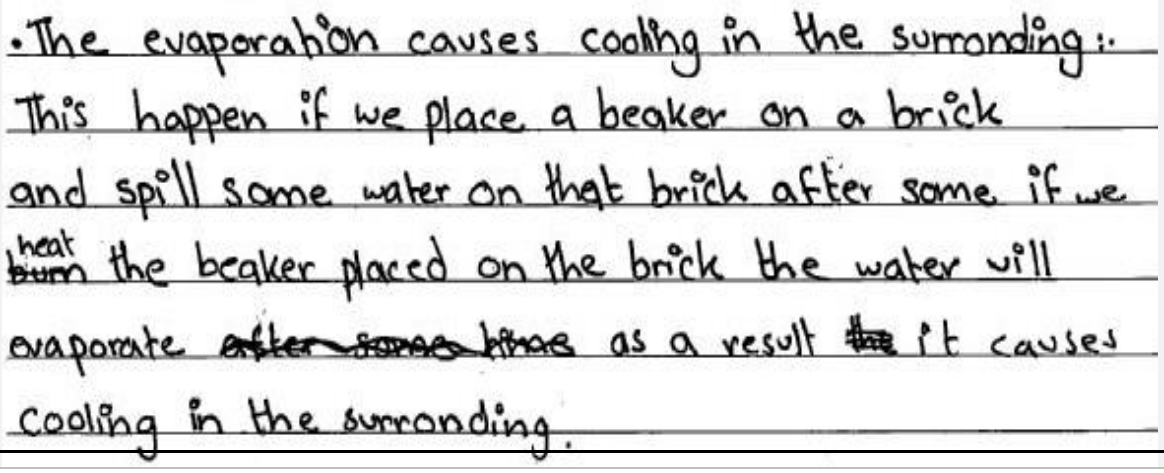
Any Additional Suggestion:

- Classroom teaching should incorporate the concepts of inertia and gravitational force in conjunction with Newton's law of gravitation, using everyday examples to illustrate these ideas.
- To improve and enhance the concept, focus on the fundamental principles of gravitational force and the effect of mass on the movement requires more deep understanding.

Question No. 4	
Question Text	Describe in THREE points, how evaporation causes cooling.
SLO No.	8.6.3
SLO Text	Explain how evaporation causes cooling.
Max Marks	03
Cognitive Level	U
Checking Hints	1 mark for writing each point (3 required)
Overall Performance	Overall, the responses to this question varied in quality. Some candidates effectively explained the concept, detailing how evaporation involves heat absorption as molecules escape from the liquid, which results in a lower temperature of the remaining liquid. These responses were clear, well-articulated, and demonstrated a solid understanding of the thermal dynamics involved. In contrast, some responses lacked detail or clarity, struggling to adequately address the role of heat absorption or the impact on temperature.
Description of Better Responses	In *better responses*, candidates provided clear and accurate explanations of why evaporation causes cooling. They effectively discussed how evaporation involves the absorption of heat as molecules escape from the liquid to gaseous phase, which lowers the temperature of the remaining liquid. Additionally, candidates correctly identified the connection between kinetic energy and temperature, noting that during evaporation, heat is absorbed from the surrounding environment.
Image of Better Response	
Description of Weaker Responses	In *weaker responses*, candidates struggled to explain why evaporation causes cooling, with responses often lacking detail or clarity, with many failing to adequately address the role of heat absorption during evaporation and its effect on the liquid's temperature. Additionally, some candidates presented incorrect ideas, attributing the cooling effect to the loss or gain of electrons, the conductivity of materials, or even pollution. Many responses incorrectly linked these concepts to the cooling effect. The majority of candidates, however, focused on defining evaporation and discussing the factors that influence it, rather than explaining the cooling effect accurately.
Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	Pedagogy Used for that SLO	Assessment Strategies
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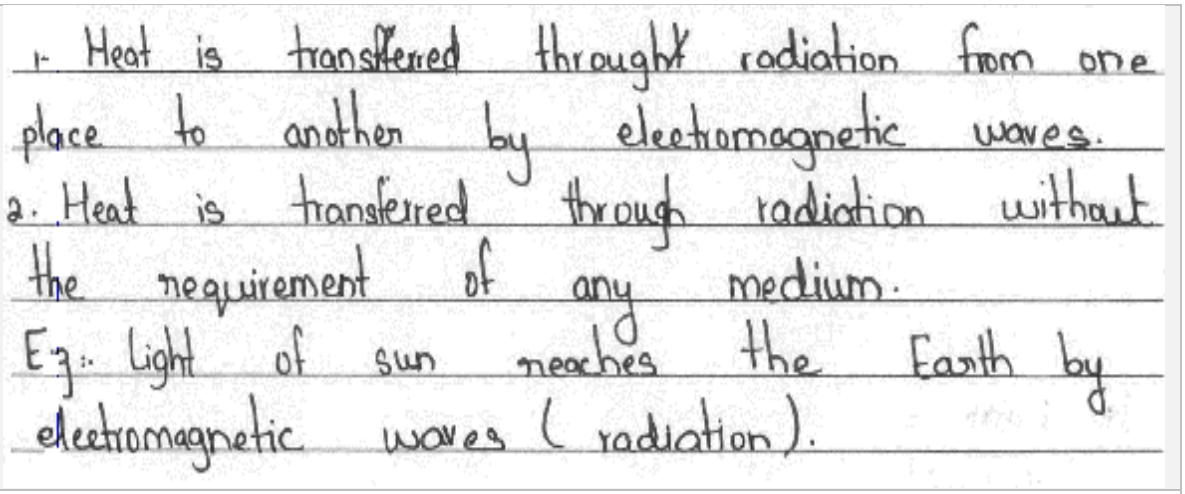
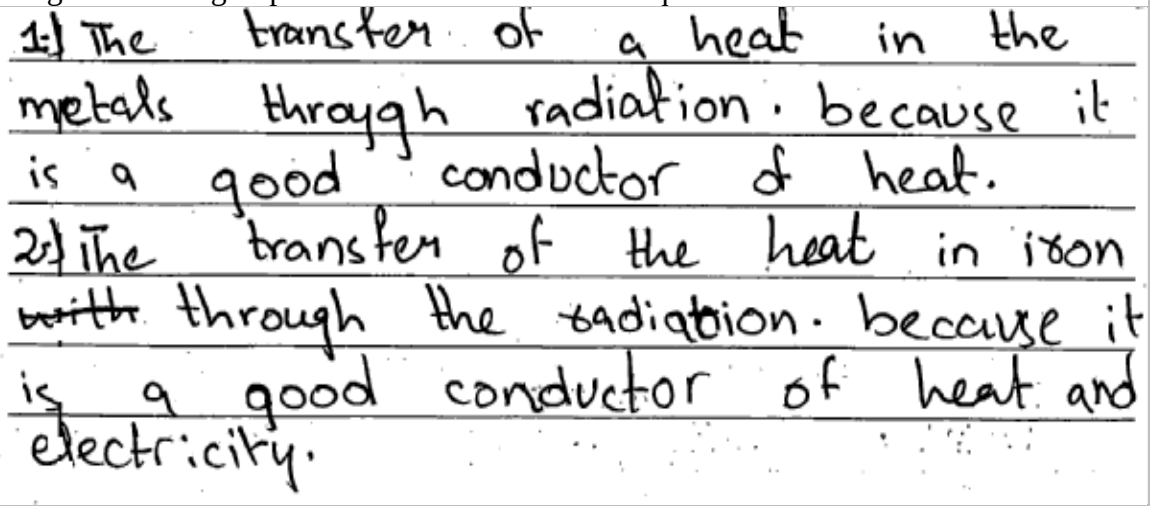
Any Additional Suggestion:

- To improve the quality of explanations, teachers must emphasise their students to focus on their understanding and clearly explaining the fundamental principles of heat transfer and the process by which evaporation causes cooling. Greater attention to these core elements will enhance the overall clarity and effectiveness of their responses.
- To improve, subject teachers should clear the basic principles of heat transfer and how evaporation affects temperature changes.

Question No. 5	
Question Text	Describe the transfer of heat through radiation in TWO points. Support your answer with an example.
SLO No.	9.4.1
SLO Text	Describe radiation as the emission or transmission of energy.
Max Marks	03
Cognitive Level	U
Checking Hints	1 mark for writing the description (Any 2 required) 1 mark for writing an example
Overall Performance	Overall, the responses to explaining thermal radiation varied significantly. Some candidates clearly defined thermal radiation as the transfer of heat through electromagnetic waves without requiring a medium and effectively used examples like the Sun or a heat lamp to illustrate the concept. However, some responses lacked detail and clarity, failing to adequately describe the nature of thermal radiation or provide relevant examples.
Description of Better Responses	Candidate's responses on explaining thermal radiation were comprehensive and well-explained. They effectively described thermal radiation as the transfer of heat through electromagnetic waves, which does not require a medium to travel. Examples, such as the warmth felt from the Sun or a heat lamp, were relevant and illustrative of the concept. Clear understanding and accurate explanations demonstrated a strong grasp of thermal radiation and its practical applications.

Image of Better Response	
Description of Weaker Responses	*Weaker responses* did not fully capture the concept of thermal radiation or provide a clear example(s). Several responses lacked detail about how thermal radiation involves the transfer of heat via electromagnetic waves and not through a medium. Some candidates had difficulty providing relevant examples or explaining them incorrectly. While some simply included definitions of heat, its SI unit, and evaporation. Others described evaporation and boiling water or fog as processes of heat transfer in liquids and metals.
Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

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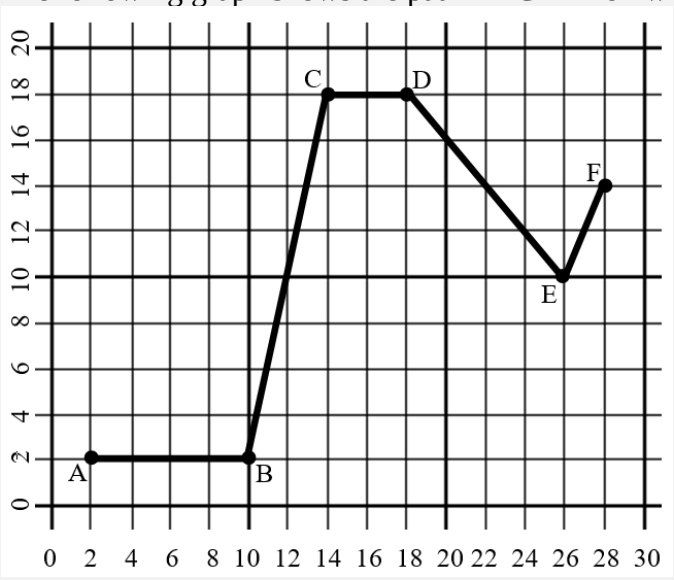
Any Additional Suggestion:

- Encourage the student to apply their understanding of radiation to real-world scenarios. This could involve discussing how radiation is used in medical imaging, telecommunications, or nuclear power generation.
- Suggested additional resources can deepen their understanding of radiation, which include scientific articles, videos, or simulations that illustrate radiation in different contexts.
- Focus should be given on the clear explanation of the fundamental principles of thermal radiation and ensure that examples effectively demonstrate the concept.

Extended Response Questions (ERQs)

Extended response questions offered a choice between parts 'a' and 'b'

Question No. 6a	
Question Text	The following graph shows the path ABCDEF on which a boy walks.  Using the above graph calculate the i. distance between A to B, B to C, C to D, D to E and E to F. (4 Marks) ii. total distance covered. (1 Mark) iii. total displacement covered. (1 Mark) (**Note**: One small division is equal to one metre.)
SLO No.	2.8.2
SLO Text	Plot and interpret distance-time graph and speed-time graph.
Max Marks	06
Cognitive Level	A

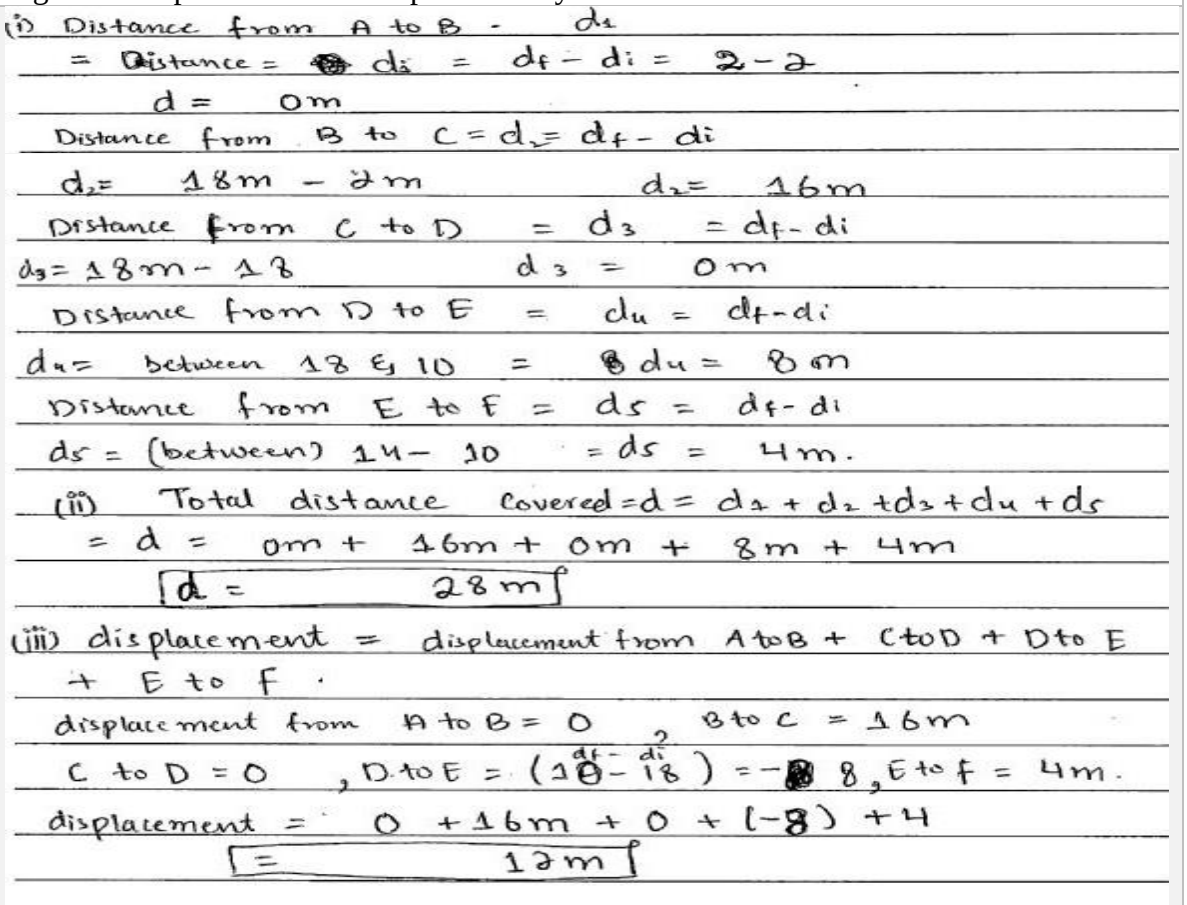
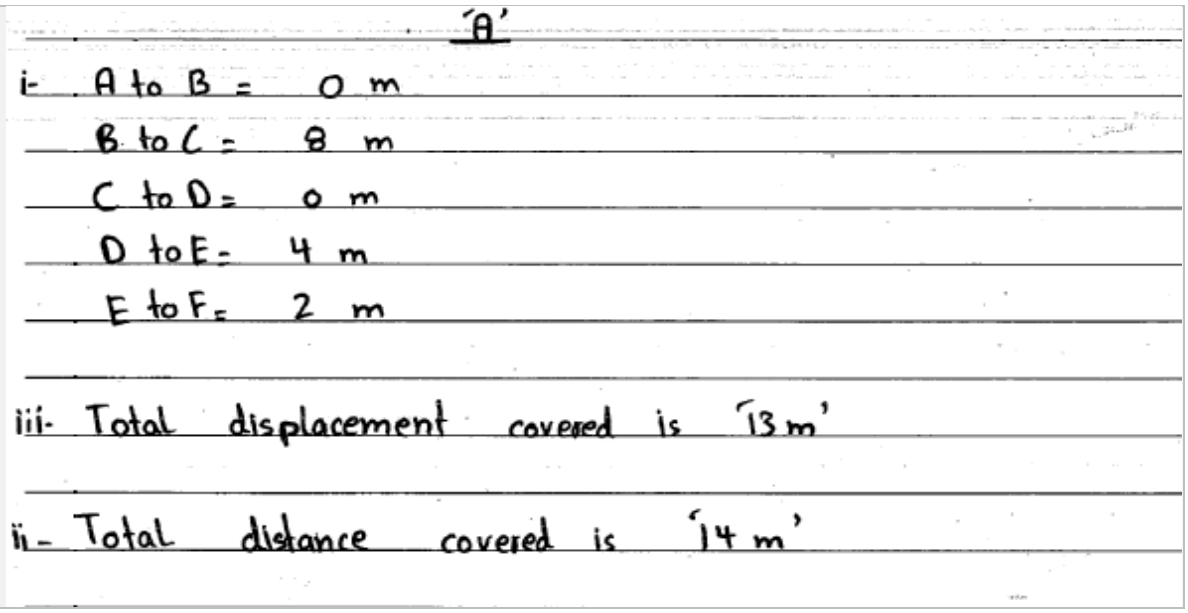
Checking Hints	i. Distance covered by the boy during A to B is 0 m During C to D the boy covers 0 m] (1 mark) Distance covered by the boy during B to C the boy covers 18-2 = 16 m (1 mark) During D to E the boy covered 18 – 10 = 8 m (1 mark) During E to F the boy covered 14 – 10 = 4 m (1 mark) ii. Total Distance = 16 + 8 + 4 = 28 m (1 mark) iii. Total Displacement = 12 m (1 mark)
Overall Performance	Overall, the majority of the candidates attempted part (b) of this question and accurately calculated distances from the distance-time graph and correctly determined both total distance and total displacement. Their responses were clear, well-organised, and demonstrated a solid understanding of the concepts. However, some responses contained errors in graph interpretation or calculations, resulting in incorrect answers and unclear explanations.
Description of Better Responses	The majority of responses were excellent, demonstrating a clear understanding of how to calculate distances by interpreting the given distance-time graph. Many candidates accurately determined the distances for the required intervals and correctly computed both the total distance and total displacement. Their calculations were precise, with well-organised steps that made their process easy to follow.
Image of Better Response	
Description of Weaker Responses	*Weaker responses* exhibited various errors and misconceptions. Many candidates made mistakes in calculating distances from the given distance-time graph because they were unable to interpret and understand the given graph and failed to determine both the total distance and total displacement. Misinterpretations of the graph or incorrect calculations also led to inaccurate results. Furthermore, the steps were often unclear or incomplete, making it difficult to follow the process.

Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

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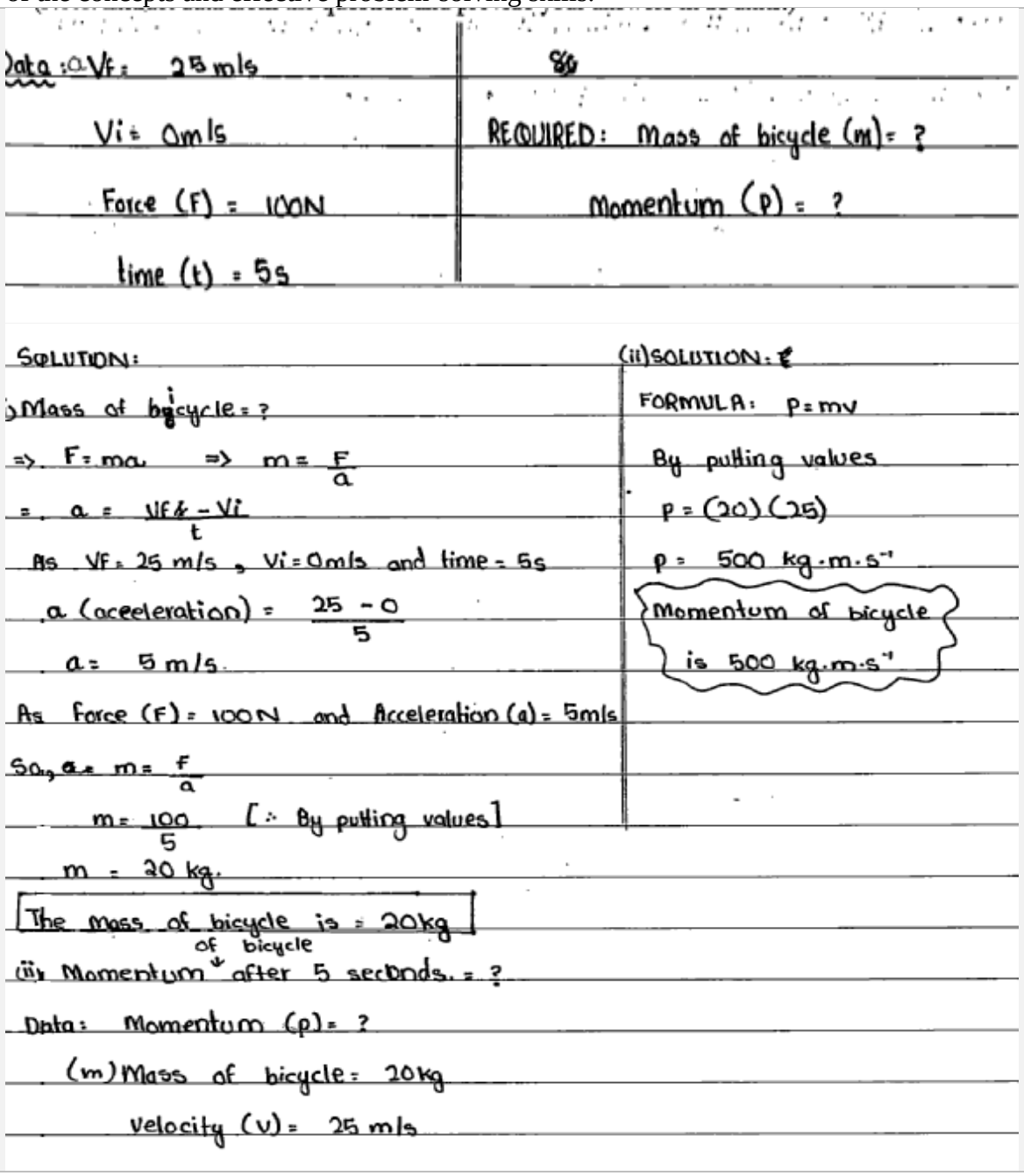
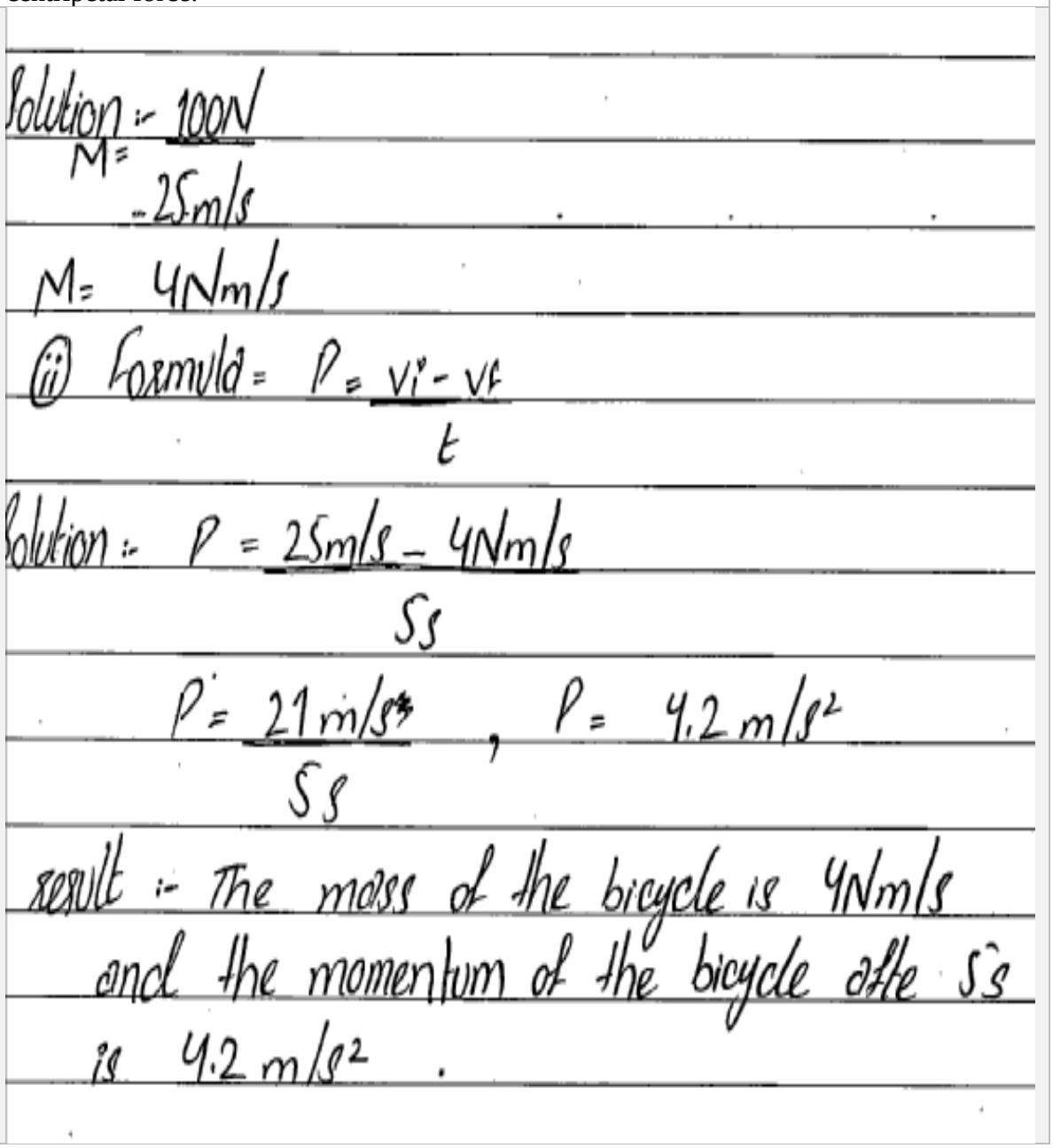
Any Additional Suggestion:

Teachers should focus on reading the graph, ensuring precise calculations and clearly presentation by their students to enhance both the accuracy and clarity of the responses.

Question No. 6b	
Question Text	A sports bicycle acquires a velocity of 25 m/s from the state of rest when a force of 100 N acts on it for 5 s. Find i. the mass of the bicycle. ii. the momentum of the bicycle after 5 s. (**Note**: Extract data from the question and provide your answers in SI units.)
SLO No.	3.2.3
SLO Text	Solve word problems related to force and momentum.
Max Marks	06
Cognitive Level	A

Checking Hints	i. 1 mark for extracting and writing the correct data 1 mark for finding the correct value of acceleration using first equation of motion 1 mark for the correct formula of mass 1 mark for finding the value of 'm' with the correct SI unit ii. 1 mark for the correct formula of momentum 1 mark for finding the value of 'P' with SI unit
Overall Performance	Overall, the responses featured accurate calculations for mass and momentum using the given force, time, and velocity. Candidates applied the correct formulas and provided clear, precise calculations. Their explanations were well-organised, reflecting a solid understanding of the concepts. However, some responses showed errors in formula application or calculations, leading to incorrect results and unclear explanations.
Description of Better Responses	The majority of responses were excellent, as they accurately calculated both mass and momentum using the given force, time and velocity. Candidates effectively applied the correct formulas, such as Mass = force / acceleration and Momentum = mass × velocity and provided clear and precise calculations. In many responses, calculations were well-structured, demonstrating a strong understanding of how these physical quantities interrelate. Overall, their thorough approach and clear presentation showcased a solid grasp of the concepts and effective problem-solving skills.
Image of Better Response	

Description of Weaker Responses	*Weaker responses* included errors in calculating mass and momentum using the given force, time, and velocity. Incorrect application of formulas or miscalculations in putting wrong values in F = ma and P = mv resulted in inaccurate outcomes. Additionally, the calculations were often unclear or incomplete, making it challenging to understand the process. Moreover, there were misunderstandings regarding the momentum formula, incorrect interpretations of force, or improper substitutions of acceleration and time. Some candidates incorrectly used Newton's law of gravitation, while others applied the formula for centripetal force.
Image of Weaker Response	

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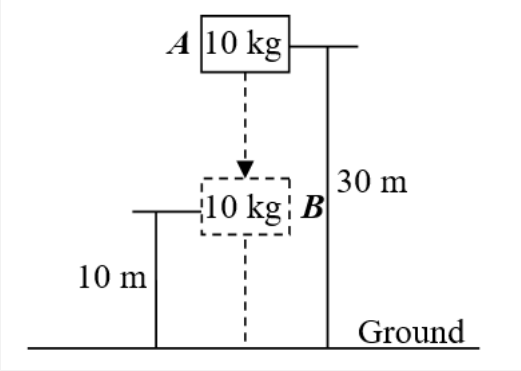
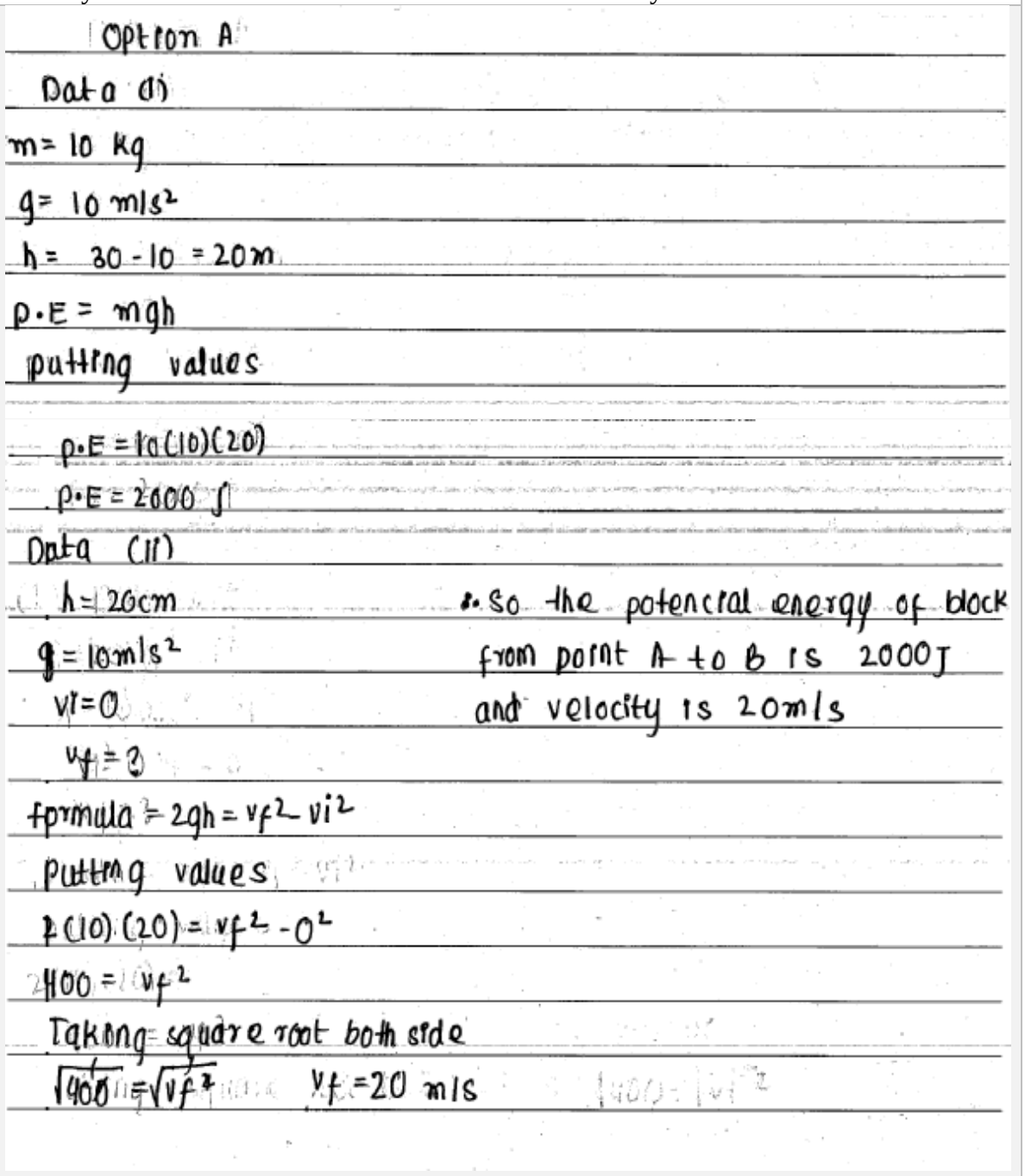
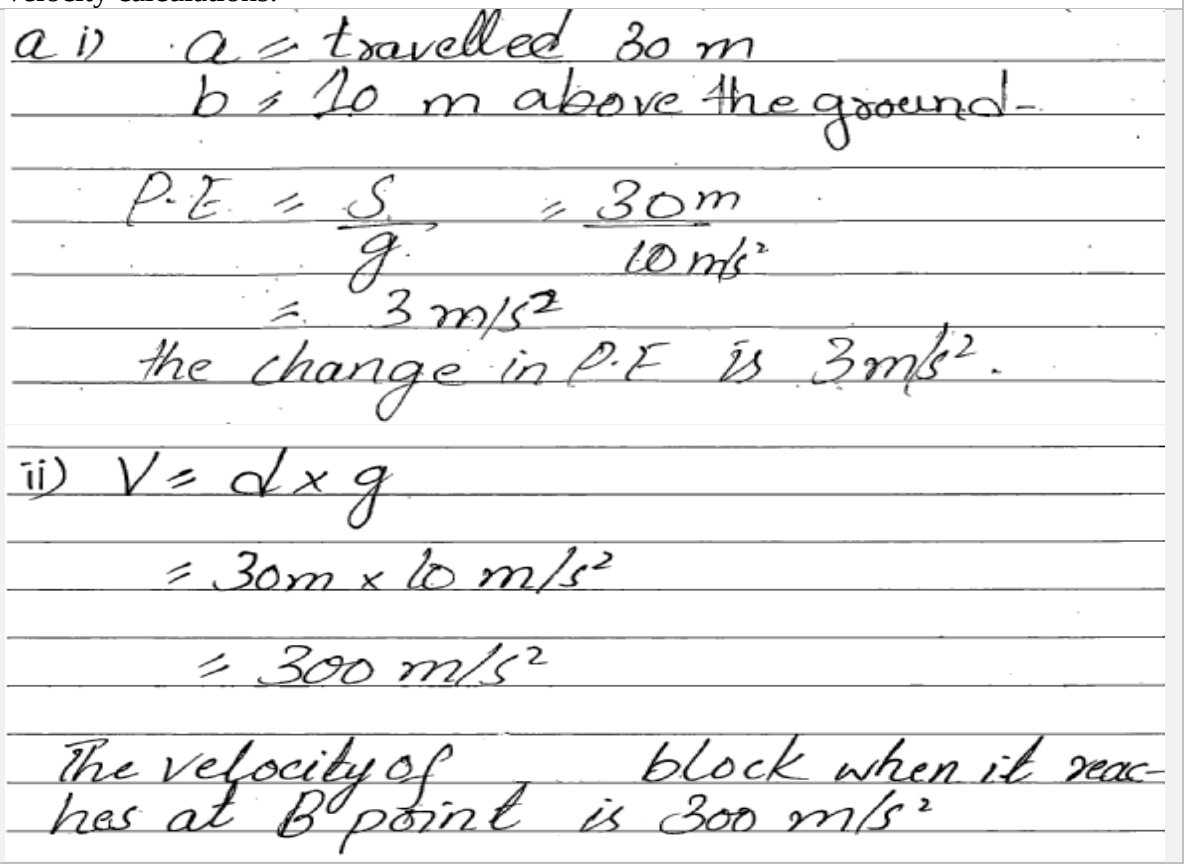
Any Additional Suggestion:

To enhance the quality of the answers, teachers should focus on using the correct formulas, performing precise calculations and clearly explaining in each step. So that their students must address these issues and significantly improve the accuracy and clarity of the responses.

Question No. 7a	
Question Text	The diagram shows a block is dropped from a point ***A*** and moves to a point ***B***.  i. Calculate the change in potential energy (P.E.) of the block at point ***B*** with respect to ground. ii. Calculate the velocity of the block when it reaches to the point ***B***. (**Note**: Take the value of acceleration due to gravity 'g' as 10 m/s^2.)
SLO No.	6.2.3
SLO Text	Word problems on kinetic and potential energy.
Max Marks	06
Cognitive Level	A

Checking Hints	1 mark for the correct data 1 mark for the correct formula (P.E = m g h) 1 mark for the correct answer of P.E 1 mark for writing the correct formula of K.E = P.E. 1 mark for the correct formula; K.E = ½ m v^2 1 mark for the correct answer of velocity
Overall Performance	Overall, the majority of the candidates attempted part (b) of the question. In this part candidates accurately calculated both the change in potential energy and the velocity of the falling object at point ***B*** by applying the correct formulas and providing clear, precise calculations. Their procedures were well-organised, demonstrating a solid understanding of energy conservation and kinematics. However, some responses contained errors in formula application or calculations, resulting in incorrect answers and unclear explanations.
Description of Better Responses	In *better responses,* candidates applied the correct formulas, and some referred to the principle of conservation of energy to determine the velocity at point ***B***, demonstrating a solid grasp of the underlying concepts. Candidates were also able to calculate the correct value of the height by subtraction and hence, they got correct value of potential energy and same due to the correct use of value of height. They can calculate the correct value of velocity as well which leads them to score full marks easily.
Image of Better Response	

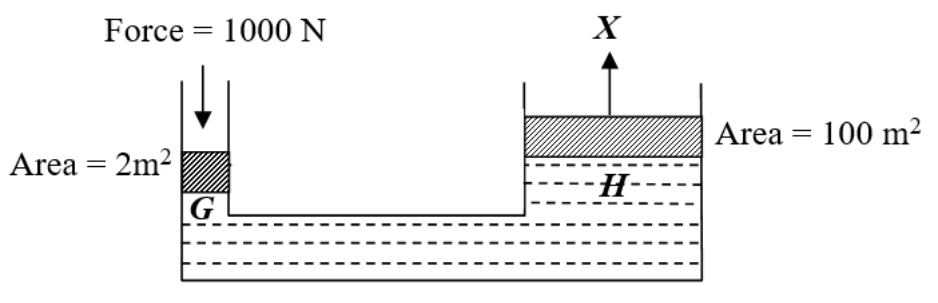
Description of Weaker Responses	In *weaker responses*, candidates used an incorrect height value, which led to errors in calculating potential energy and consequently, the velocity. Additionally, some candidates used incorrect or irrelevant equations of motion, further contributing to the inaccurate velocity calculations.
Image of Weaker Response	

Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	Pedagogy Used for that SLO	Assessment Strategies
• Identify the expectation of command words (use Command Word Guide) • Ensure the content is taught at the relevant cognitive level • Identify necessary content required (skills + concepts) • Review past paper questions on the concept • Utilise the resource guide for additional materials	• Story Board • Cause and Effect • Fish and Bone • Concept Mapping • Audio Visual Resources • Think, Pair and Share • Knowledge Platform videos • Questioning Technique (Socratic approach) • Practical Demonstration	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform https://akueb.knowledgeplatform.com/login

Any Additional Suggestion:

- Ensure that students use the correct formulas for potential and kinetic energy consistently. These skills can be enhanced by practicing more and more questions.
- Evaluate if students correctly apply the principle of conservation of energy to solve for velocity at point ***B***.
- Subject teachers should focus on the performance of their students while using the correct formulas, performing accurate calculations and clearly presenting each step to enhance both the accuracy and clarity of your responses.

Question No. 7b	
Question Text	The given figure shows the brake system of a vehicle.  i. Name the law which is used in the given brake system. ii. Calculate the pressure exerted by the liquid at G and H and the force that is applied at X.
SLO No.	7.5.3
SLO Text	Apply and demonstrate the use of Pascal's law.
Max Marks	06
Cognitive Level	A
Checking Hints	1 mark for the correct identification of the law 1 mark for the correct answer for pressure at G 1 mark for the correct answer for pressure at H 1 mark for the finding the correct value of P 1 mark for the correct formula of force 1 mark for the correct force at X
Overall Performance	Overall, the quality of responses varied widely. Some candidates accurately identified Pascal's Law and used it effectively to calculate the force on the second cylinder and the pressure in both cylinders. These responses featured correct formulas, precise calculations, and well-organised steps, reflecting a strong grasp of fluid mechanics. However, other responses contained errors in identifying the law, applying incorrect formulas, or making miscalculations, leading to inaccurate results and unclear explanations.
Description of Better Responses	In *better responses*, candidates accurately identified Pascal's Law and effectively used it to calculate the force on the second cylinder using the force on the first cylinder and the areas of both cylinders. Candidates applied the correct formulas and provided clear and precise calculations for both force and pressure on each cylinder. In calculating force and pressure in different cylinders, candidates correctly used the formula of $F_2 = P_2 \times A$ or $F_2 = (F_1 / A_1) \times A_2$ to determine force in second cylinder. Additionally, better responses highlighted the correct units which show their unit consistency (e.g., Pascal or Newton per square metre). Their explanations were well-organised and reflected a strong understanding of fluid mechanics principles. Overall, their thorough approach and clear presentation showcased a solid grasp of the concepts and effective problem-solving skills.

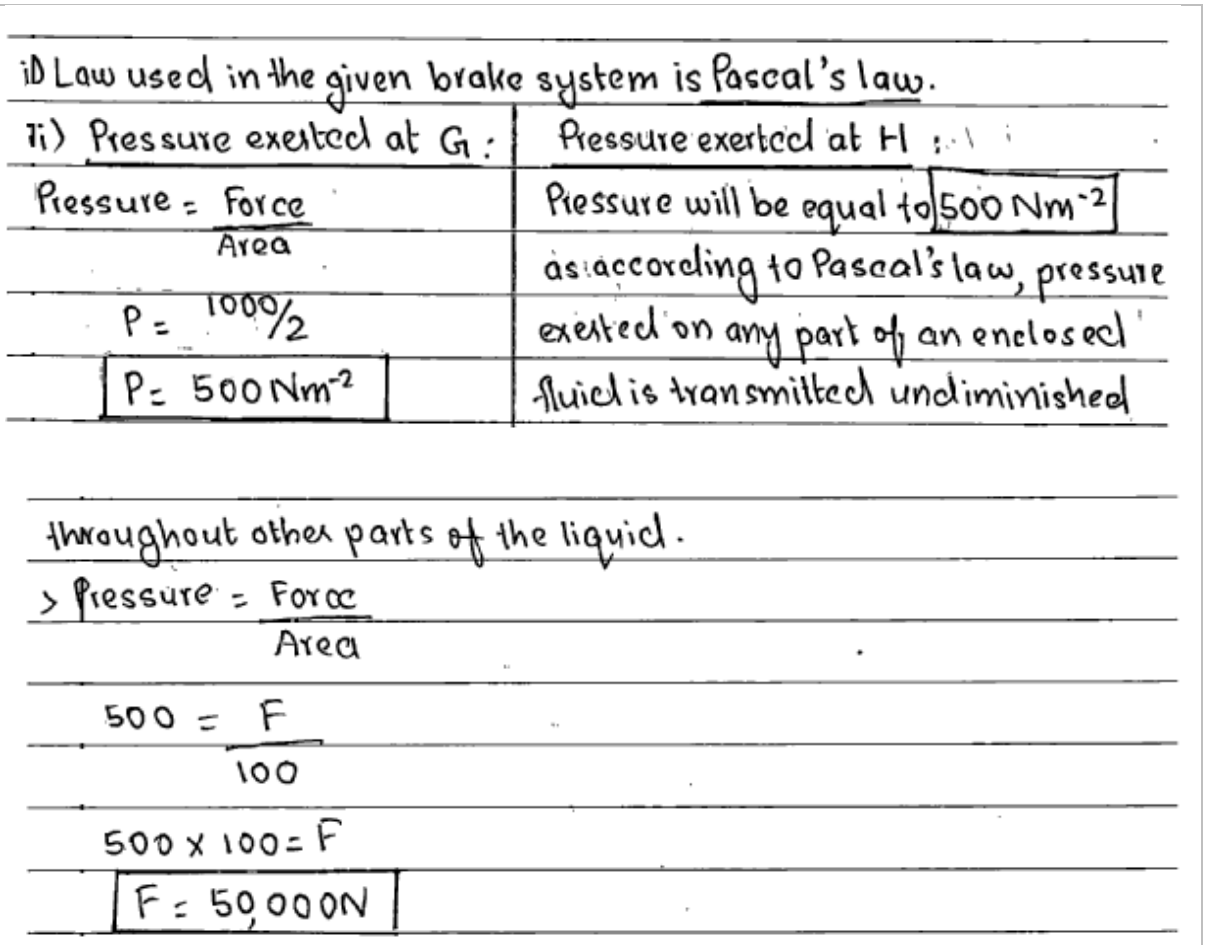
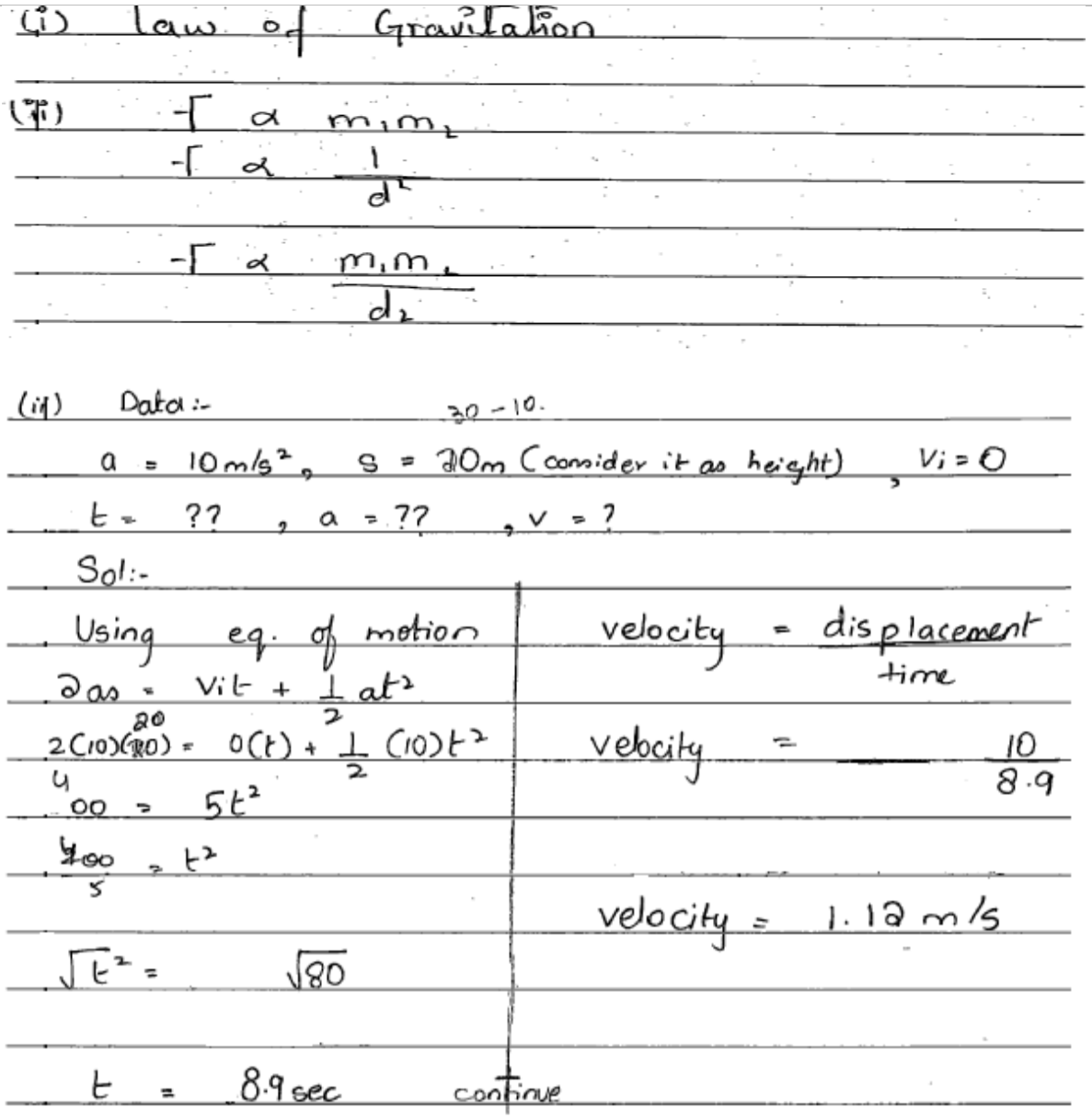
Images of Better Responses	
Description of Weaker Responses	*Weaker responses* contained errors in identifying Pascal's Law or applied it incorrectly to calculate the force on the second cylinder. They made mistakes in using the given areas or miscalculations in force and pressure that led to incorrect results. Additionally, explanations were unclear or incomplete, making it difficult to follow their process. Moreover, some candidates incorrectly identified Archimedes' Principle or Boyle's Law. Archimedes' Principle pertains to buoyancy, while Boyle's Law deals with the relationship between pressure and volume in gases. Some candidates also provided vague answers like 'laws of motion' or 'Newton's law of gravitation' without specifying Pascal's Law. In calculating force and pressure, candidates either used the incorrect formula F = P / A, applied formulas incorrectly or misunderstood the relationship between force, area, and pressure.

Image of Weaker Response



Suggestions for improvement (Highlight all that apply)

Maximising SLO Achievement	Preferred Pedagogy Used for this SLO	Assessment Strategies
• Identify the expectation of command words (use Command Word Guide) • Ensure the content is taught at the relevant cognitive level • Identify necessary content required (skills + concepts) • Review past paper questions on the concept • Utilise the resource guide for additional materials	• Story Board • Cause and Effect • Fish and Bone • Concept Mapping • Audio Visual Resources • Think, Pair and Share • Knowledge Platform videos • Questioning Technique (Socratic approach) • Practical Demonstration	• Past paper questions • Discussion on E-Marking Notes • AKU-EB Digital Learning Solution powered by Knowledge Platform https://akueb.knowledgeplatform.com/login

Any Additional Suggestion:

- Emphasise the importance of clear and precise definitions when identifying scientific principles.
- Connect theoretical concepts (laws and formulas) with practical applications (like hydraulic systems) to reinforce understanding.
- Encourage students to analyse their mistakes to understand where and why they went wrong, promoting deeper learning.
- By structuring your questions in light of the above-mentioned suggested points, you can help candidates not only correct their misconceptions but also deepen their understanding of the scientific principles involved in hydraulic systems.

Annexure A: Pedagogies Used for Teaching the SLOs

Pedagogy: Storyboard
Description: A visual pedagogy that uses a series of illustrated panels to present a narrative, encouraging creativity and critical thinking. It helps learners organise ideas, sequence events, and comprehend complex concepts through storytelling.
Example: In a Literature class, students are tasked with creating storyboards to visually retell a novel. They draw key scenes, write captions, and present their stories to the class, enhancing their reading comprehension and fostering their imagination.

Pedagogy: Cause and Effect
Description: This pedagogy explores the relationships between actions and consequences. By analysing cause-and-effect relationships, learners develop a deeper understanding of how events are interconnected and how one action can lead to various outcomes.
Example: In a history class, students study the causes and effects of the Industrial Revolution. They research and discuss how technological advancements in manufacturing led to significant societal changes, such as urbanisation and labour reform movements.

Pedagogy: Fish and Bone
Description: A method that breaks down complex topics into main ideas (the fish) and supporting details (the bones). This visual approach enhances comprehension by highlighting essential concepts and their relevant explanations.
Example: During a Biology class on human anatomy, the teacher uses the fish and bone technique to teach about the human skeletal system. Teacher presents the main components of the human skeleton (fish) and elaborates on each bone's structure and function (bones).

Pedagogy: Concept Mapping
Description: An effective way to visually represent relationships between ideas. Learners create diagrams connecting key concepts, aiding in understanding the overall structure of a subject and fostering retention.
Example: In a Psychology assignment, students use concept mapping to explore the various theories of personality. They interlink different theories, such as Freud's psychoanalysis, Jung's analytical psychology, and Bandura's social-cognitive theory, to see how they relate to each other.

Pedagogy: Audio Visual Resources
Description: Incorporating multimedia elements like videos, images, and audio into lessons. This approach caters to different learning styles, making educational content more engaging and memorable.
Example: In a General Science class, the teacher uses a documentary-style video to teach about the solar system. The video includes stunning visual animations of the planets, interviews with astronomers, and background music, enhancing students' interest and understanding of space.

Pedagogy: Think, Pair, and Share
Description: A collaborative learning technique where students ponder a question or problem individually, then discuss their thoughts in pairs or small groups before sharing with the entire class. It fosters active participation, communication skills, and diverse perspectives.
Example: In a Literature in English class, the teacher poses a thought-provoking question about a novel's moral dilemma. Students first reflect individually, then pair up to exchange their opinions, and finally participate in a lively class discussion to explore different viewpoints.

Pedagogy: Questioning Technique (Socratic Approach)
Description: Based on Socratic dialogue, this method stimulates critical thinking by posing thought-provoking questions. It encourages learners to explore ideas, justify their reasoning, and discover knowledge through a process of inquiry.

Example: In an Ethics class, the instructor uses the Socratic approach to lead a discussion on the meaning of justice. By asking a series of probing questions, the students engage in a deeper exploration of ethical principles and societal values.

Pedagogy: Practical Demonstration
Description: A hands-on approach where learners observe real-life applications of theories or skills. Practical demonstrations enhance comprehension, skill acquisition, and problem-solving abilities by bridging theoretical concepts with real-world scenarios.
Example: In a Food and Nutrition class, the instructor demonstrates the proper technique for filleting a fish. Students observe and then practice the skill themselves, learning the practical application of knife skills and culinary precision.

(**Note:** The examples provided in this annexure serve as illustrations of various pedagogies. It is important to understand that these pedagogies are versatile and can be applied across subjects in numerous ways. Feel free to adapt and explore these techniques creatively to enhance learning outcomes in your specific context.)

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These contributors include:

• Dur Nasab, Associate, Curriculum Development, AKU-EB

• Zain Muluk, Manager, Examination Development, AKU-EB

• Raabia Hirani, Manager, Curriculum Development, AKU-EB

• Ali Aslam Bijani, Manager, Teacher Support, AKU-EB

• Dr Naveed Yousuf, CEO, AKU-EB