

(A) Multiple Choice Questions

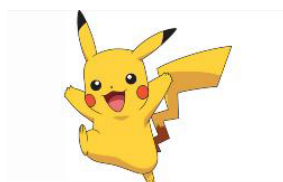
Choose the best option for each question.

- A.** Coca-cola **B.** Glass cleaner
C. Baking soda **D.** Toothpaste

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- The graph shows the titration curve of a weak acid with sodium hydroxide. The x-axis represents the volume of sodium hydroxide solution added in cm³, ranging from 0 to 60. The y-axis represents the pH value of the solution, ranging from 0 to 14. The curve starts at a pH of approximately 1 at 0 cm³, rises steeply between 20 and 40 cm³, and levels off at a pH of approximately 14 for volumes greater than 40 cm³.

- (1) acidic. (2) alkaline. (3) neutral.
- A. (1) only B. (2) only
- C. (1) and (3) only D. (2) and (3) only

- (1) X is more acidic than Y. (2) Y is more acidic than X. (3) X and Y are acids.
- A.** (1) only **B.** (2) only
- C.** (1) and (3) only **D.** (2) and (3) only



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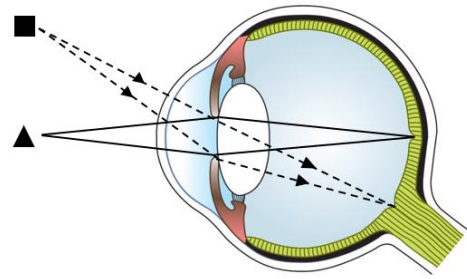
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6. The diagram on the right shows how light enters Steve's right eye and how images are formed in it. Which of the following statement is NOT correct?

- A. The square cannot be seen by Steve.
 B. The square can be seen by Steve.
 C. The triangle can be seen by Steve.
 D. Messages are sent to brain through optic nerve.



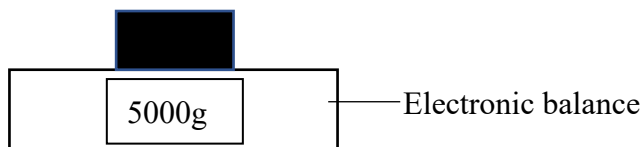
7. A goalkeeper is kicking a football as shown.



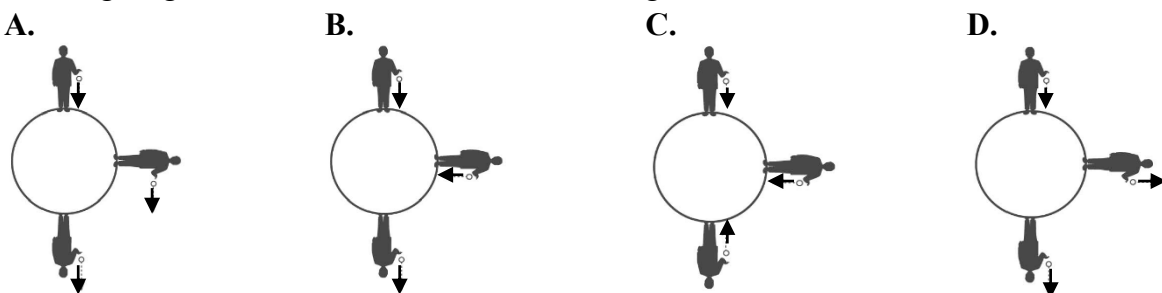
Which of the following may change?

- (1) The speed of the ball (2) The shape of the ball (3) The direction of the ball
 A. (1) and (2) only B. (1) and (3) only
 C. (2) and (3) only D. (1), (2) and (3)

8. The mass of an object is shown below. What is the weight of the object?



- A. 5N
 B. 50N
 C. 500N
 D. 5000N
9. Which of the following make use of friction?
- (1) Turn a door knob with our hands
 (2) The braking system of a car
 (3) A car moving through the air
- A. (1) and (2) only B. (1) and (3) only
 C. (2) and (3) only D. (1), (2) and (3)
10. If a person drops a ball at three different places on Earth, gravity will make it fall. Which of the following diagrams CORRECTLY shows the fallings of the ball?



(B) Matching**(10 marks)**

Match words(s) in column A with the best meanings or examples in column B

Column A	Column B
1. A force	a. is the strength of vibration of sound.
2. Frequency	b. can increase air resistance.
3. Loudness	c. is alkaline that neutralizes excess acid in the stomach.
4. Newton	d. can detect chemicals in air.
5. Tongue	e. can detect pain.
6. Skin	f. contains calcium carbonate.
7. Nose	g. is a pull or push on an object.
8. Parachute	h. can detect chemicals in food.
9. Antacid	i. is the number of vibrations per second.
10. Limestone status	j. is the unit of force.

Answers to Part C and D should be marked on the Answer Sheets for Part C and D.**(C) Fill in the blanks****(15 marks)**

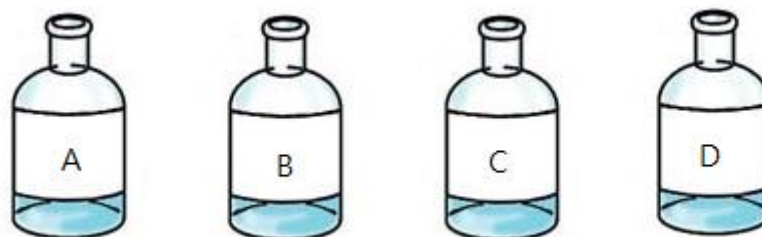
Fill in the blanks with the most suitable word(s).

- Acids have a (a) taste while alkalis have a (b) taste.
- The mass of reactants and products is (c) in neutralization.
- When acid reacts with alkali, it can be represented by the following word equation:
Acid + Alkali → (d) + (e)
- Concentrated acids are highly (f), we should handle them with care.
- There are three types of cone cells in our eyes. They are sensitive to green, (g) or (h) light.
- Our eyes cannot see clearly when the object is too (i). In this case, a microscope can help us see clearly.
- Sound is produced by (j) of objects.
- Sound can be transmitted through air, (k), (l).
- A magnet can attract iron nails without touching them. Magnetic force is a (m) force.
- When an object falls under gravity with no other forces acting on it, its motion is called (n) fall.
- When two surfaces are in contact and slide over each other, (o) arises between the surfaces.

(D) Structured Questions**(65 marks)**

Questions marked with an asterisk (*) carry a bonus mark for good communication skills.

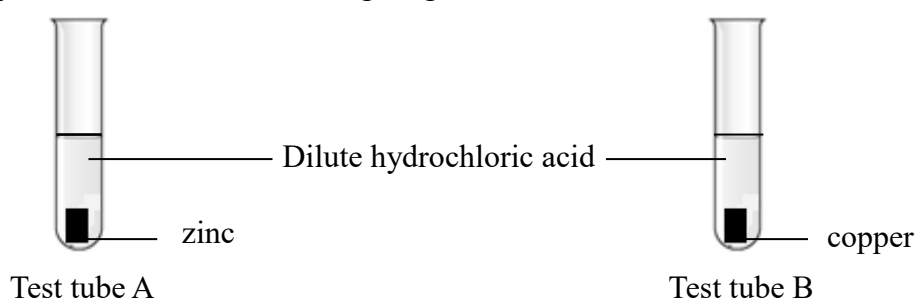
1. Tom uses universal indicator to test for pH value of four solutions in the laboratory.
(Solutions A, B, and C are colourless, while solution D is **dark blue**.)



The results are shown below:

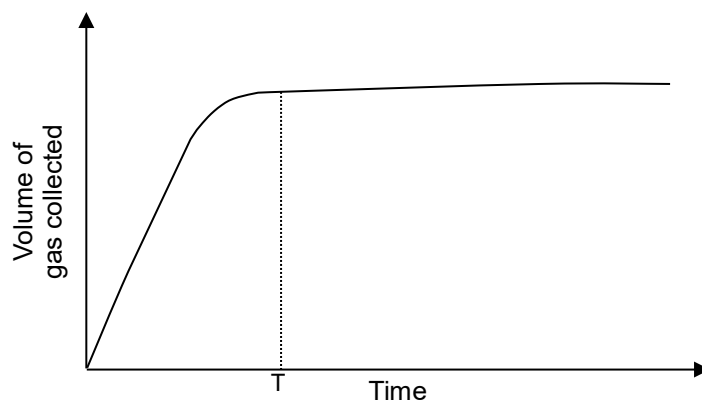
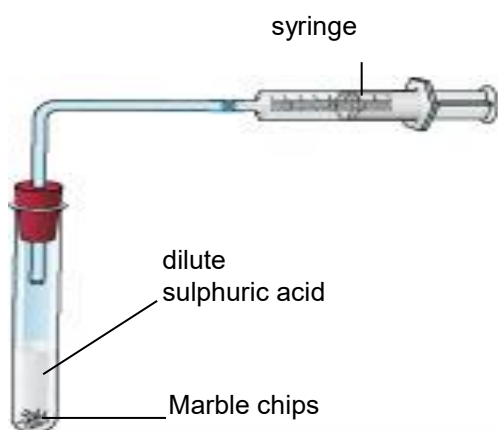
Solution	Colour of the pH paper	pH value
A	Orange	4
B	Green	7
C	Red	1
D	Blue	?

- a. Why universal indicator can be used as an acid-alkali indicator? (1 mark)
 - b. (i) Which solution is neutral? (1 mark)
(ii) Suggest an example with such pH value. (1 mark)
 - c. Comparing solutions A and C, which one is more acidic? (1 mark)
 - d. Tom suggested that solution D must be alkaline. Do you agree? Explain. (2 marks)
 - e. (i) Suggest a more suitable method to measure the pH value of solution D. (1 mark)
(ii) What are the advantages of using the equipment in (e)(i) over pH paper? (2 marks)
2. In an experiment, Peter wants to compare the reactions of zinc and copper with dilute hydrochloric acid and the set-ups are shown in the following diagram below.

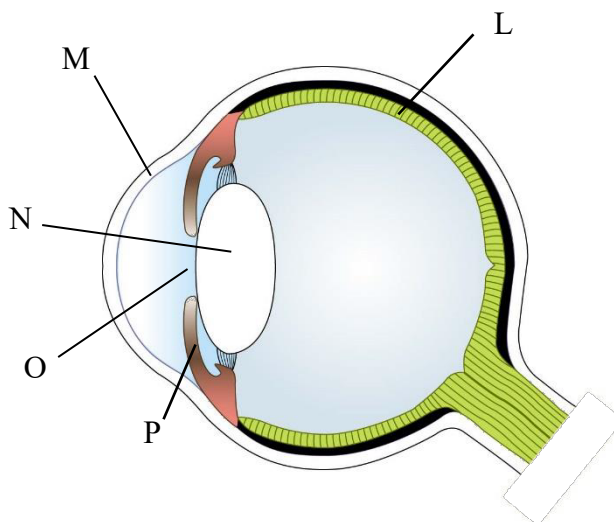


- a. (i) State the independent variable of the experiment. (1 mark)
(ii) State one controlled variable of the experiment. (1 mark)
- b. After few hours, the zinc is taken out of the test tubes and are dried with a piece of cloth. It is then weighted on the electronic balance, state the change of its weight. (1 mark)
- c. (i) Gas X is produced during the reaction in test tube A. What is gas X? (1 mark)
(ii) How can gas X be tested? (2 marks)
- d. What will be observed in test tube B? (1 mark)
- e. What should Peter do **immediately** if he spill some acid onto his hand during the experiment? (2 marks)

3. The diagram below shows a set-up to collect the gas given off when marble chips are added to dilute sulphuric acid. The graph on the right shows the volume of gas collected throughout the experiment.

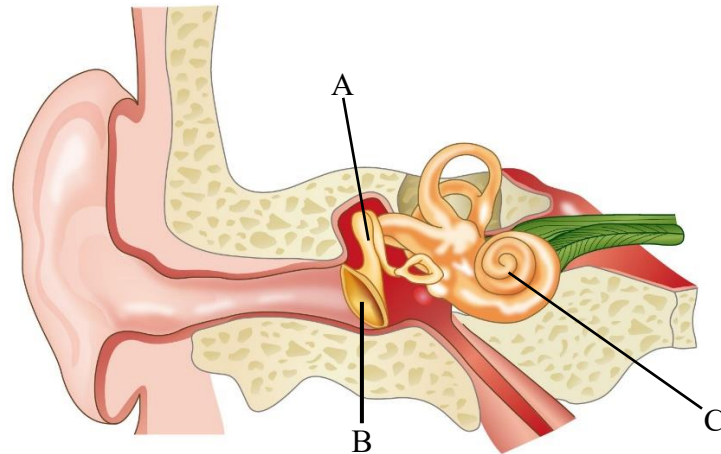


- What is the gas collected? (1 mark)
 - How can we test the gas collected in (a)? (2 marks)
 - Why does the volume of gas collected stop increasing after time T? (1 mark)
 - Acid rain contains sulphuric acid and nitric acid.
 - State one air pollutant that make up the acid rain. (1 mark)
 - Explain how acid rain affect the lives in water. (2 marks)
 - Suggest two daily habits to help control acid rain. (2 marks)
4. The following diagram shows the structure of an eyeball.



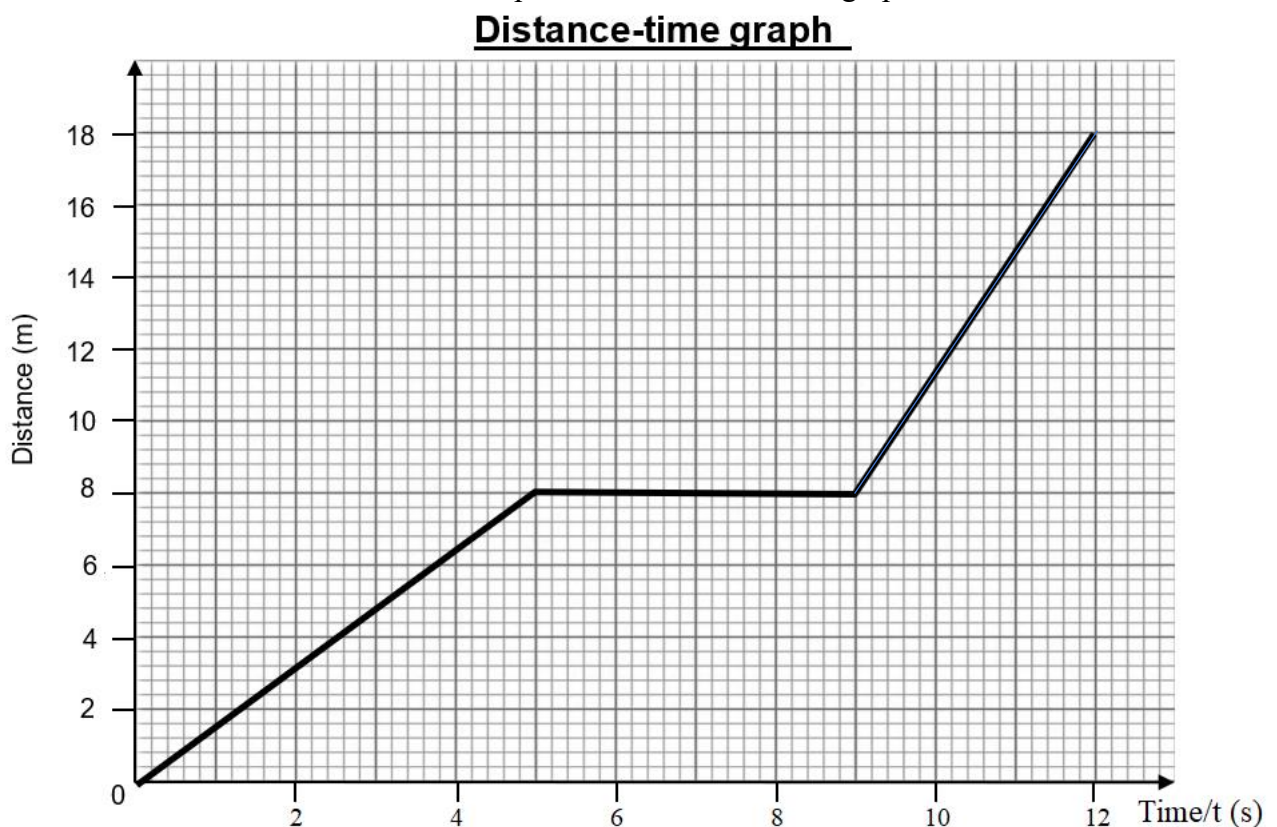
- Referring to parts L to P, which parts of the human eye are transparent? (2 marks)
- What is the function of part P? (1 mark)
- What happens to part N when we see a near object? (1 mark)
 - Draw a ray diagram when a person is looking at the airplane in the sky. (2 marks)

5. Answer the following questions with reference to the diagram below:



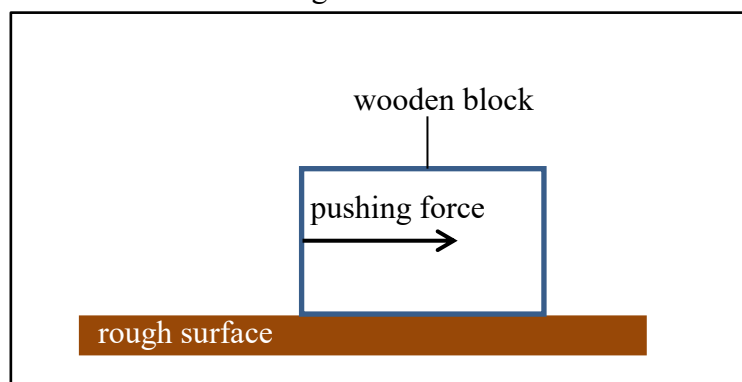
- a. (i) Using letter, which structure changes sound waves into vibrations? (1 mark)
- (ii) What is the function of structure C? (1 mark)
- b. (i) What happens if structure A is broken? (1 mark)
- *(ii) Explain your answer for (i). (3 marks)
- c. Suggest a way to protect your ears. (1 mark)

6. A bus travels for 12 seconds to the bus stop and the distance – time graph of the bus is shown below:

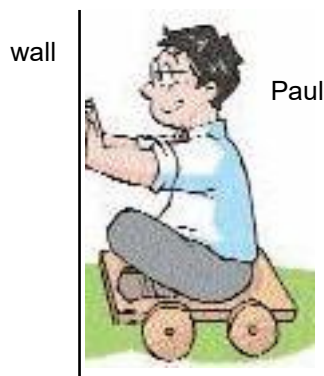


- a. What is the total distance travelled by the bus? (1 mark)
- b. (i) Calculate the average speed of the bus in the first 3 seconds. Show your calculations. (2 marks)
- (ii) Calculate the average speed of the bus from 0 s to 12s. Show your calculations. (2 marks)
- *c. Describe the motion of the bus from $t=0$ to $t=12s$. (3 marks)

7. A student is pushing a wooden block on a rough surface and the wooden block starts moving.



- Draw and label** an arrow on the diagram to show the friction acting on the wooden block on the answer sheet. (2 marks)
 - What instrument can be used in the laboratory to measure the size of friction? (1 mark)
 - *c. Are the pushing force and the friction balanced? Explain your answer. (3 marks)
 - Name TWO methods of reducing friction. (2 marks)
 - When the student stops pushing the wooden block, it remains at rest on the surface, **draw** the free-body diagram of the wooden block in the answer sheet. (2 marks)
8. Paul sits on a cart and pushes against a wall. He moves backwards for 10 metres.



- Draw and label** a pair of forces acting on the wall and on Paul in the answer sheet when Paul pushes against the wall. (4 marks)
- The two forces in (a) are called (i)_____ and (ii)_____ pairs. (2 marks)
- Suggest a way for Paul to move further away from the wall. (1 mark)

~ END OF QUESTION PAPER ~

Final Examination (2023-24)
Secondary 2 Integrated Science
Total marks: 100

Answer Sheets for Part C and D

Total no. of pages: 4

Page no.	Marks
Part A & B	
1	
2	
3	
4	
Total	

Answers to Part C and D should be marked on the Answer Sheets for Part C and D.

(C) Fill in the blanks

(15 marks)

Fill in the blanks with the most suitable word(s).

a. _____	b. _____	c. _____
d. _____	e. _____	f. _____
g. _____	h. _____	i. _____
j. _____	k. _____	l. _____
m. _____	n. _____	o. _____

(D) Structured Questions

(65 marks)

Questions marked with an asterisk (*) carry a bonus mark for good communication skills.

1.	a.	_____	(1)

	b.	(i) _____	(1)
		(ii) _____	(1)
	c.	_____	(1)
	d.	_____	
		_____	(2)
	e.	(i) _____	(1)
		(ii) _____	
		_____	(2)

2.	a.	(i) _____	(1)
		(ii) _____	(1)

b.

(1)

c. (i)

(1)

(ii)

(2)

d.

(1)

e.

(2)

3. a.

(1)

b.

(2)

c.

(1)

d. (i)

(1)

(ii)

(2)

e.

(2)

4. a.

(2)

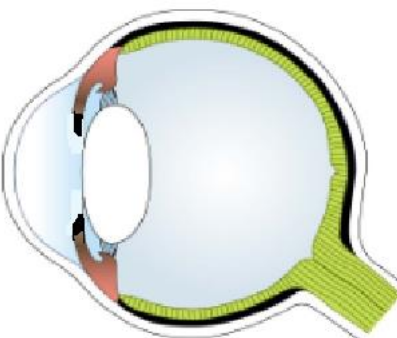
b.

(1)

c. (i)

(1)

(ii)



(2)

5.

a.

(i)

(1)

(ii)

(1)

b.

(i)

(1)

* (ii)

(3)

c.

(1)
6.

a.

(1)

b.

(i)

(2)

(ii)

(2)

*c.

(3)
7.

a.

wooden block

pushing force

rough surface

(2)

b.

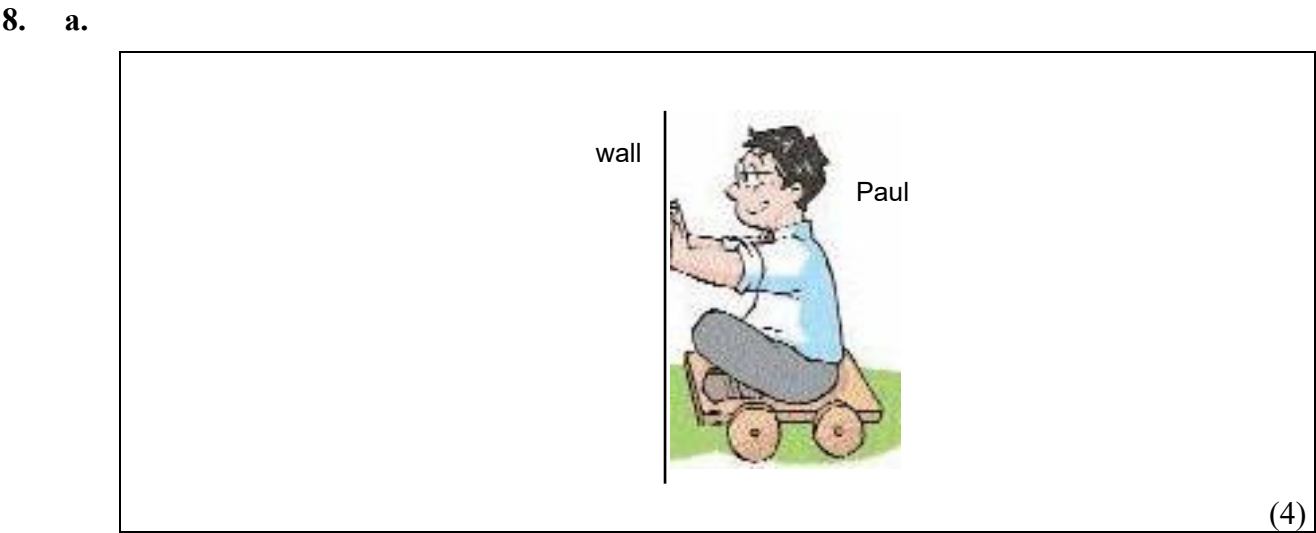
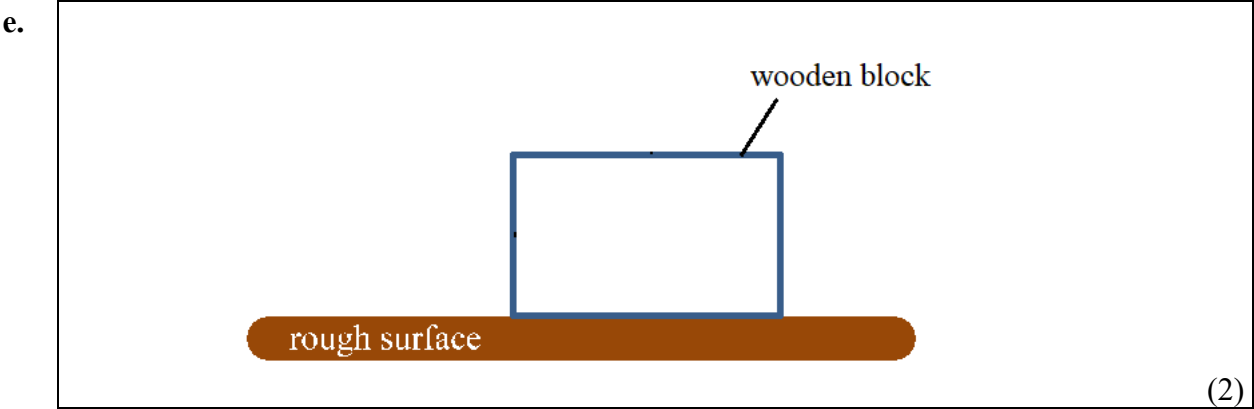
(1)

*c.

(3)

d.

(2)



b.

(i)

(1)

(ii)

(1)

c.

(1)