



Paper **E**. Form 1 / Primary 6 / Year 6 Student Workbook

Original ICAS-style practice questions with full worked answers — for students sitting ICAS Paper E, taken by Form 1 (Malaysia), Primary 6 (Singapore), and Year 6 (Australia) students.



English · 28 Q



Writing · 2 tasks



Science · 10 Q



Maths · 12 Q



Digital Tech · 8 Q

STUDENT NAME

SCHOOL

DATE

TOTAL QUESTIONS

58 original ICAS-style questions + 2 writing tasks

ANSWERS

Full worked explanations at back

BEFORE YOU BEGIN

How to Use This Workbook

Every question in this workbook is an original ICAS-style practice question carefully written to match the format, text types, difficulty, and question style of real ICAS Paper E. The same paper is taken by students in Form 1 (Malaysia), Primary 6 (Singapore), and Year 6 (Australia).

Your Test at a Glance — Paper E (Official ICAS Format)

SUBJECT	QUESTIONS	TIME	TIME GUIDANCE	HALFWAY CHECK	FORMAT
 English	50	55 min	~11 min per passage (read + answer)	Passage 3–4 by 28 min	Passage-based MCQ
 Writing	1 task	35 min	5 min plan · 25 min write · 5 min check	Writing by 5 min	Extended Response
 Science	40	60 min	~90 sec per Q	Q20 by 30 min	MCQ with diagrams
 Mathematics	40	60 min	~90 sec per Q	Q20 by 30 min	MCQ · No Calculator
 Digital Tech	40	40 min	~60 sec per Q	Q20 by 20 min	MCQ · Computer-based



English

Practice · 28 questions · 32 minutes · All questions are based on a text

28

QUESTIONS

32

MINUTES

At Paper E level, every question is based on a text. You will read several different text types in a real paper — informational articles, literary fiction extracts, fictional interviews with historical figures, expository pieces, and a phrase-level cloze. Key vocabulary words are underlined in some texts as they appear in the real test.

TEXT 1 OF 4 — INFORMATIONAL ARTICLE

The Bone Diviners

Original article for ICAS preparation purposes

Dr Maya Voss has spent twenty years learning to read a language that cannot be spoken. She is a forensic osteologist — a scientist who examines human bones. When a skeleton is uncovered at a crime scene, an archaeological site, or a mass grave, she is one of the specialists who can begin to unravel the story it contains.

'Bones remember,' she tells me, running her gloved fingers along the length of a femur laid out on a steel table in her laboratory. 'They remember childhood illnesses. They remember what a person ate. They remember injuries that healed and injuries that didn't. In some cases, they remember how a person died.'

To the untrained eye, the femur looks like any other. To Voss, it is a sentence — a thickened ridge here, a healed stress fracture there, the telltale pitting of a childhood nutritional deficiency.

THE DETECTIVE WORK

Modern forensic osteology is a fusion of biology, medicine, and detective work. From a single adult skeleton, a skilled practitioner can often determine age within five years, biological sex with reasonable accuracy, approximate height, and whether the person was right- or left-handed. The curve of the spine reveals whether they carried heavy loads. The wear patterns on the teeth suggest their diet. In some cases, the shape of the skull hints at geographic ancestry.

But the bones do not give up their secrets easily. A healed fracture can be mistaken for a post-mortem injury. A pathological change can resemble damage caused by animals. Voss insists that the hardest skill to teach new students is patience. 'You have to be willing to be wrong,' she says. 'The bones don't lie, but your first reading of them often does.'

WHEN THE DEAD SPEAK

Forensic osteologists are increasingly called upon not only in criminal investigations but in humanitarian work — identifying the victims of wars, natural disasters, and mass atrocities. It is slow, painstaking work. A single case can take months, sometimes years. But for the families of the missing, the work matters enormously. Identification allows grief to begin. It allows a name to be returned to a body.

'People sometimes ask me if the work is depressing,' Voss says. 'It isn't. It's the opposite. Every skeleton I look at is someone who was loved. My job is to give them back some of what was taken from them when they became anonymous.'

She looks again at the femur on the table.

'This one had rickets as a child,' she says, quietly. 'Someone went hungry. Someone was poor. I can't tell you who they were. But I can tell you they were real.'

Questions 1–7 are about *The Bone Diviners*

1

VOCABULARY — WORD MEANING IN CONTEXT

The word pathological in the fifth paragraph most likely means

- A dangerous or infectious.
- B related to disease or illness.
- C extremely old.
- D made deliberately.

2

TEXT COMPREHENSION — MAIN IDEA OF PARAGRAPH

The third paragraph (beginning 'To the untrained eye') mainly shows that

- A the femur is an unusual kind of bone.
- B forensic osteologists have unusually good eyesight.
- C what looks ordinary to most people is rich with information to an expert.
- D bones become easier to read with time in a laboratory.

3

WRITER'S CRAFT — EFFECT OF A ONE-SENTENCE PARAGRAPH

Near the end of the article, the writer uses the one-sentence paragraph '*She looks again at the femur on the table.*' What is the effect of this single sentence?

- A It provides scientific information that could not fit elsewhere.
- B It slows the reader and prepares them for Voss's final, quiet observation.
- C It corrects an error made earlier in the article.
- D It suggests that Voss has grown tired of her work.

4

TEXT COMPREHENSION — NOT IN THE TEXT

Which of the following is NOT given in the article as something a forensic osteologist can determine from a single adult skeleton?

- A approximate height
- B whether the person was right- or left-handed
- C the person's name
- D geographic ancestry

5

WRITER'S CRAFT — MODALITY

Which of the following quotations from the text expresses the strongest certainty?

- A 'In some cases, the shape of the skull hints at geographic ancestry.'
- B 'The bones don't lie.'
- C 'They remember, in some cases, how a person died.'
- D 'Your first reading of them often does.'

6

TEXT COMPREHENSION — INFER CENTRAL MOTIVATION

In her final quotation Voss says she can tell the reader the anonymous person 'was real.' What does this reveal about her motivation for doing the work?

- A She wants to prove the scientific accuracy of her methods above other methods.
- B She only feels satisfied when she identifies every victim by name.
- C She is motivated by restoring dignity and recognition to people who have become anonymous.
- D She wishes she had chosen a less emotionally difficult career.

7

TEXT COMPREHENSION — GENERALISE WRITER'S INTENTION

Taking the article as a whole, the writer's main purpose is

- A** to persuade readers to take up the study of forensic osteology.
- B** to explain how forensic osteology works and convey its emotional significance.
- C** to argue that bones are the most important evidence at any crime scene.
- D** to describe a specific criminal case solved by Dr Voss.

In Conversation with Hypatia

Hypatia of Alexandria (c. 360–415 CE) was one of the most celebrated mathematicians and philosophers of the ancient world. The following interview is entirely imagined, though it draws on historical records of her work.

You are often described as the first female mathematician in the historical record. How do you feel about that title?

I do not feel particularly honoured by it. The title says more about the paucity of records that survive about women of my time than it says about me. There were undoubtedly women before me who did mathematics. The difference is that nobody bothered to write their names down.

Your work has been compared to that of Euclid and Diophantus. Did you see yourself as their equal?

I saw myself as their student, first. You cannot walk without first learning where others have placed their feet. Later, perhaps, I walked further than some of them. I wrote commentaries on the *Arithmetica* of Diophantus and on the *Almagest* of Ptolemy. I did not consider my work to be lesser than theirs because I was explaining and extending their ideas. In my time, to explain a difficult text clearly was itself considered a scholarly act of the highest order.

What do you believe you were best at?

I was best at making difficult ideas understandable. This is, I believe, the truest form of scholarship — not to invent a new theorem every Tuesday, but to take a theorem that has been misunderstood for a century and explain it in a way that a bright student can finally grasp. My students came to Alexandria from across the Mediterranean because of this.

You lived during a period of religious and political turmoil in Alexandria. Did this frighten you?

It concerned me — which is not quite the same thing. I had seen enough riots in Alexandria to know that knowledge is always the first thing burned, and philosophers the first people blamed. I continued to teach because I believed the alternative — silence — was worse. The library was not ours to keep safe forever. It was ours to fill with as much learning as we could, so that some of it might survive us.

What would you say to someone today who dismisses philosophy as impractical?

I would say that they have not thought about it for long enough. Philosophy, done well, is simply the practice of thinking carefully. Mathematics is one kind of careful thinking. Ethics is another. Astronomy is another. A person who does not value careful thinking is, in the end, at the mercy of anyone who does.

Questions 8–14 are about *In Conversation with Hypatia*

8

VOCABULARY — WORD MEANING IN CONTEXT

The word **paucity** in Hypatia's first response most likely means

A accuracy.

B abundance.

C scarcity or shortage.

D importance.

9

TEXT COMPREHENSION — OPENING RESPONSE REVEALS

Hypatia's opening response indicates that she

A is proud of being called the first female mathematician.

B disagrees with the way the title has been framed.

C is reluctant to discuss her own achievements.

D believes the interviewer has made a factual mistake.

10

WRITER'S CRAFT — ANALYSE A FIGURATIVE COMPARISON

Hypatia says '*You cannot walk without first learning where others have placed their feet.*' What is this comparison used to suggest?

- A Learning must always begin with physical practice.
- B Mathematics is a form of walking rather than thinking.
- C Her work would have been impossible without the scholarship that came before her.
- D Euclid's work was more important to her than Diophantus's work.

11

WRITER'S CRAFT — INTERPRET IDIOMATIC PHRASE

Hypatia says '*not to invent a new theorem every Tuesday*'. What is the effect of this phrase?

- A It implies that ancient theorems were traditionally invented on Tuesdays.
- B It gently mocks the idea that scholarship must constantly produce something new.
- C It refers to a specific event in her own life.
- D It is a direct quotation from the writings of Euclid.

12

TEXT COMPREHENSION — INFER CHARACTER'S MOTIVATION

Why did Hypatia continue to teach during the period of unrest in Alexandria?

- A She had no other way to earn a living.
- B Her students refused to allow her to stop teaching.
- C She believed silence was worse than the risk of speaking.
- D She was unaware of the dangers in the city.

13

VOCABULARY — WORD MEANING IN CONTEXT

The word 'turmoil' in the interviewer's fourth question most nearly means

A silence.

B upheaval.

C celebration.

D tradition.

14

TEXT COMPREHENSION — GENERALISE CENTRAL MESSAGE

Taking the interview as a whole, what is the central message Hypatia appears to want to convey?

A That she was the greatest mathematician of her age.

B That ancient Greek philosophy should be studied more widely today.

C That careful thinking — whether mathematical, ethical, or astronomical — is deeply practical and worth defending.

D That ancient libraries should always be protected from political violence.

The Night of the Borrowed Coat

Original fiction extract for ICAS preparation purposes

Amara had worn her sister's coat without asking — which was, in itself, not unusual. What was unusual was that Naomi hadn't noticed. Or, more precisely, Amara suspected Naomi had noticed and had chosen not to say anything, which was worse.

It was the grey wool coat, the one with the torn lining that their mother had promised to mend before Christmas three years in a row and had now apparently abandoned as a lost cause. Amara had taken it from the hook by the door and walked out into the cold, partly because her own jacket was not warm enough and partly, she admitted to herself, because she had been curious how it would feel to walk through the evening wearing something that belonged so entirely to someone else.

It had felt, she decided, like pretending to be taller.

When she came home, she hung the coat back on its hook with the careful precision of someone attempting to make a lie look ordinary. Naomi was at the kitchen table, working on her university application, and did not look up. She was writing with the same small concentrated frown she had worn since she was nine years old.

Amara stood in the doorway for a long moment, watching her sister, and said nothing.

'The coat smells of cold air,' Naomi said eventually, without lifting her head. 'You can borrow it again, if you ask me first.'

Amara felt something warm and unfamiliar move through her chest — the feeling of being seen, and also of being forgiven before she had quite decided whether she needed forgiveness.

She said, 'Thank you.' And then, because Naomi had still not looked up: 'I'm sorry.'

'Don't apologise,' said Naomi. 'Just ask.'

Questions 15–22 are about *The Night of the Borrowed Coat*

15

VOCABULARY — WORD MEANING IN CONTEXT

The word **unfamiliar** most nearly means

- A foreign or from another country.
- B a feeling Amara had not experienced before.
- C cold and unpleasant.
- D painful and confusing.

16

TEXT COMPREHENSION — INFER CHARACTER'S FEELINGS

When Amara thinks 'which was worse,' she reveals that she

- A feels Naomi has behaved worse than she has.
- B thinks Naomi is slow for not noticing the coat was missing.
- C would have preferred Naomi to confront her directly.
- D wanted to provoke Naomi into an argument.

17

TEXT COMPREHENSION — INFER FROM A SPECIFIC DETAIL

The detail about the torn lining suggests that the family

- A is wealthy enough to own many coats.
- B has small, unfulfilled promises that accumulate, but life carries on around them.
- C is about to throw the coat away.
- D does not get along well with one another.

18

WRITER'S CRAFT — INTERPRET FIGURATIVE LANGUAGE

Amara describes wearing her sister's coat as feeling 'like pretending to be taller.' This image conveys that

- A the coat was physically too long for Amara.
- B Amara and Naomi are the same height in the story.
- C Amara felt she was inhabiting an identity that did not quite fit her.
- D Amara was trying to deceive someone outside the house.

19

WRITER'S CRAFT — EFFECT OF WORD CHOICE

The phrase 'with the careful precision of someone attempting to make a lie look ordinary' conveys that

- A Amara is an experienced liar.
- B Amara is conscious of her small deception and feels the weight of it.
- C Naomi has been watching Amara closely all evening.
- D the coat must be hung carefully so as not to damage the lining further.

20

SYNTAX — IDENTIFY PART OF SPEECH

In the sentence '*She was writing with the same small concentrated frown she had worn since she was nine years old, looking down at her page,*' which of the underlined words is NOT used as a verb?

- | | |
|----------------|-----------|
| A writing | B worn |
| C concentrated | D looking |

21

TEXT COMPREHENSION — INFER CHARACTER'S CHOICE

Why does Naomi say 'The coat smells of cold air' rather than accuse her sister directly?

- A She has not yet realised the coat was taken.
- B She is choosing an indirect, gentle way to open a potentially difficult conversation.
- C She is afraid of her sister's reaction if confronted directly.
- D She is attempting to distract Amara from her university application.

22

TEXT COMPREHENSION — INFER THEME

Taking the extract as a whole, what does it most strongly suggest about the sisters' relationship?

- A They are in open conflict and barely communicate.
- B Amara is jealous of Naomi's academic success.
- C They communicate meaningful things through small, understated exchanges.
- D Naomi is controlling and critical of her younger sister.

TEXT 4 OF 4 — CLOZE PASSAGE

The Language of Rivers

Original cloze passage for ICAS preparation purposes. For each numbered blank, choose the option that best completes the text.

For hundreds of years, rivers had their own language. Every bend, every shallow, every stretch of fast water was named and known by the people who made their living on the water. Most of those names are now forgotten. They were not written down — they were passed on from older boatmen to younger ones, (23).

A boatman on the Severn in 1850 might speak of 'the dog's elbow' — a sharp bend where a careless crew could easily ground themselves. Fifty kilometres downstream, a stretch of calm, wide water was called 'the widow's meadow'. The river at that point had drowned a landlord in the previous century, (24). These were not romantic names — they were warnings.

Today, when a surveyor maps a river, the old names are rarely recorded. (25), the old knowledge is slowly slipping away. A few historians have begun to record what remains, but it is a race against time.

Some linguists have suggested that these lost river-names may (26), recording information about currents, hazards and seasonal changes that modern mapping cannot easily reproduce. Every forgotten name, they argue, is not merely a word but a small loss of practical knowledge (27).

Whether or not the names can be recovered, the rivers themselves will continue to behave as they always have. The difference is that soon there will be no one left (28).

23

SYNTAX — COMPLETE THE TEXT (PHRASE-LEVEL)

Choose the option that best completes blank (23).

A for reasons nobody quite remembers

B in a tradition stretching back centuries

C because they cost nothing to produce

D while map-makers ignored them entirely

24

SYNTAX — COMPLETE THE TEXT (PHRASE-LEVEL)

Choose the option that best completes blank (24).

A even though the water looked calm

B although nobody could remember why

C and the name had stuck ever since

D while the surveyors were still working

25

SYNTAX — REPLACE A CONNECTIVE

Choose the option that best completes blank (25).**A** Despite this**B** As a result**C** On the other hand**D** In contrast

26

SYNTAX — COMPLETE THE TEXT (PHRASE-LEVEL)

Choose the option that best completes blank (26).**A** have always been made up for entertainment**B** never really have existed in the way we imagine**C** contain a kind of practical knowledge that is not easily replaced**D** be listed in modern atlases with proper spelling

27

SYNTAX — COMPLETE THE TEXT (CLAUSE)

Choose the option that best completes blank (27).**A** although rivers themselves
never change**B** that took many generations to
accumulate**C** since the industrial revolution
began**D** written down in ordinary
English

28

SYNTAX — COMPLETE THE TEXT (PHRASE-LEVEL)

Choose the option that best completes blank (28).

- A still interested in rivers at all
- B who can measure them accurately
- C to name them in the old way
- D to do the work of historians



Writing

Practice · 2 tasks · ~35 min each · Plan, write, check

2

TASKS

35

MIN EACH

The real ICAS Paper E Writing asks for **one** extended response (35 minutes). This workbook gives you **two** different tasks so you can practise both major text types: a **persuasive opinion piece** and a **narrative opening**. Plan first. Write second. Check last.

Task 1 — Persuasive



YOUR WRITING TASK

Your student newspaper is running a series of opinion pieces on the topic: *'Students should have a formal role in the decisions made about their own school.'*

Write a persuasive opinion piece of approximately **300–400 words** either **for** or **against** this statement. Your piece should include:

- A clear opening position.
- At least three supporting arguments with examples or reasons.
- Consideration of at least one likely counter-argument.
- A persuasive closing sentence.

PLANNING BOX — 5 MINUTES

Plan
5 min

Your position (for or against):

Argument 1:

Argument 2:

Argument 3:

Counter-argument you'll address:

Task 2 — Narrative

YOUR WRITING TASK

Write the opening of a narrative in which an ordinary character discovers *something that shouldn't exist* — in a place they know well.

Write approximately **300–400 words**. Your narrative opening should:

- Establish the setting clearly — make us feel the place.
- Introduce your main character through action or detail, not just description.
- Build up to the moment of discovery carefully.
- End at a point that leaves the reader wanting to know what happens next.

You do NOT need to finish the whole story — just write a strong opening.

PLANNING BOX — 5 MINUTES

Plan
5 min

The setting (a place you can describe in specific detail):

Your main character (age, one or two key traits):

What they discover that 'shouldn't exist':

The first sentence:

The last sentence (the moment of discovery):



Science

Practice · 10 questions · ~15 minutes

10

QUESTIONS

15

MINUTES

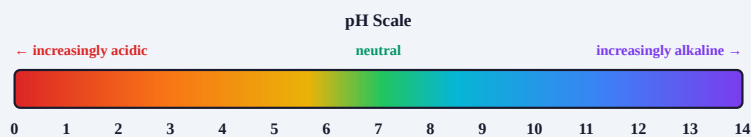
At Paper E level, Science tests *reasoning* as much as *knowledge*. Every question gives you the science you need — an explanatory sentence, a rule, or a diagram. Your job is to apply it accurately.

1

REASONING — APPLY A RULE TO NEW VALUES

pH is a measure of the acidity or alkalinity of a solution. It ranges from 0 to 14, where 7 is neutral, less than 7 is acidic, and greater than 7 is alkaline.

PH SCALE & SOLUTION DATA



Solution	pH
P	3.0
Q	6.5
R	9.0

Solution S is *more acidic* than Solution Q but *less acidic* than Solution P.

What is the likely pH of Solution S?

A less than 3.0

B between 3.0 and 6.5

C between 6.5 and 9.0

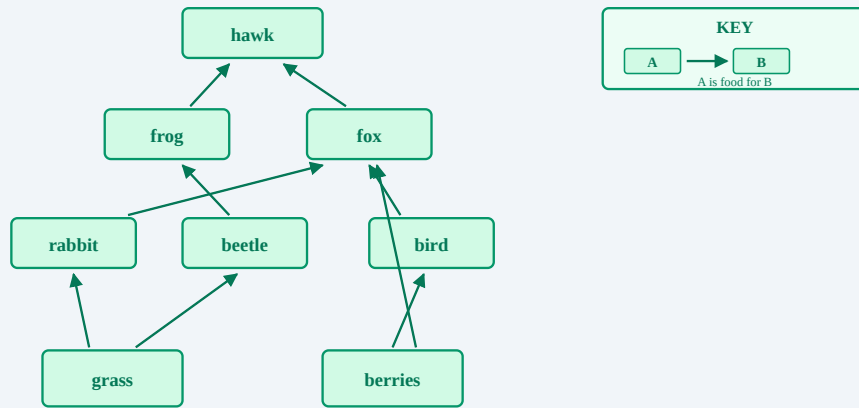
D greater than 9.0

2

REASONING — APPLY A DEFINITION

An omnivore is an animal that eats both plants and other animals. The food web below shows feeding relationships between seven living things in a woodland.

WOODLAND FOOD WEB



Which animal in this food web is an omnivore?

A rabbit

B frog

C fox

D hawk

3

INVESTIGATING — FAIR TEST CRITIQUE

Zara wanted to find out which of three fertilisers made pea plants grow tallest. She used three pots, each with pea seeds of the same variety. She added a different fertiliser to each pot. She placed: Pot A on a sunny windowsill, Pot B in a dark garage, and Pot C outside in the garden. She measured the heights of all plants after two weeks.

Was Zara's investigation a fair test, and which reasoning best supports the answer?

- A** Yes — she used the same variety of pea seed in each pot.
- B** Yes — she measured all plants after the same length of time.
- C** No — she did not test each fertiliser more than once.
- D** No — the pots were in different environments, so other variables changed as well.

4

INTERPRETING — COMBINE GRAPH AND TABLE

The graph shows temperature readings taken at a farm over five days at four times each day (midnight, 6am, noon, 6pm). Each day follows the same pattern: midnight $\approx$ 10°C, 6am $\approx$ 8°C, noon $\approx$ 17°C, 6pm $\approx$ 14°C.

SEASONAL AVERAGE TEMPERATURES

SEASON	MIDNIGHT (°C)	6AM (°C)	NOON (°C)	6PM (°C)
Spring	13	11	21	17
Summer	22	18	29	24
Autumn	10	8	17	14
Winter	-2	-5	6	3

In which season were the measurements most likely taken?

- A** Spring
- B** Summer
- C** Autumn
- D** Winter

5

REASONING — VALID INFERENCE VS OVER-REACH

Scientists studied two populations of sea otters living in two different coastal regions. The only thing they observed was that sea otters in Region A were, on average, 15% larger than sea otters in Region B. The two populations had similar diets and similar habitats.

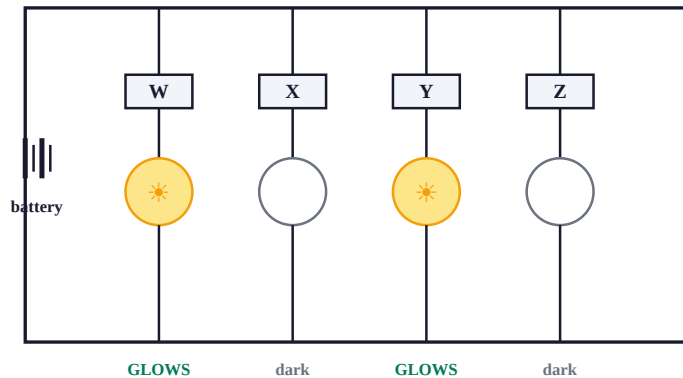
Which inference can the scientists draw from this observation alone?

- A The sea otters in Region A must have more food available to them.
- B The sea otters in Region A are a different species from those in Region B.
- C There is a difference between the two populations that affects body size.
- D The sea otters in Region A live longer than those in Region B.

REASONING — DEDUCE FROM EVIDENCE

Electricity flows in a circuit only if there is a continuous path of conducting material. A conductor allows electricity to pass through; an insulator does not. The circuit below has four parallel branches. Each branch contains one unknown object and one working bulb. Glowing bulbs indicate current is flowing.

CIRCUIT WITH UNKNOWN OBJECTS W, X, Y, Z



Based on what the bulbs show, which option correctly describes the four unknown objects?

- A W and Y are conductors; X and Z are insulators.
- B X and Z are conductors; W and Y are insulators.
- C All four objects must be conductors.
- D It is impossible to tell from the information given.

7

INTERPRETING — READ A CLASSIFICATION TABLE

Volcanic rocks can be classified by their grain size and their silica content.

VOLCANIC ROCK CLASSIFICATION

GRAIN SIZE	HIGH SILICA	MEDIUM SILICA	LOW SILICA
Fine-grained	rhyolite	andesite	basalt
Coarse-grained	granite	diorite	gabbro
Glassy	obsidian	—	—
Bubbly (vesicular)	pumice	—	scoria

Which volcanic rock has a coarse grain and a low silica content?

A basalt

B diorite

C gabbro

D scoria

8

REASONING — APPLY A GIVEN FORMULA

The speed of a moving object is given by: $\text{speed} = \text{distance} \div \text{time}$. A runner is at the 100 m mark at $t_1 = 20$ s, and at the 160 m mark at $t_2 = 40$ s.

What was the runner's speed (in metres per second) between t_1 and t_2 ?

A 1 m/s

B 2 m/s

C 3 m/s

D 5 m/s

9

OBSERVING — INTERPRET MOLECULAR DIAGRAM

Ethanol ($\text{C}_2\text{H}_6\text{O}$) is made of carbon (C), hydrogen (H) and oxygen (O). Its structure is $\text{CH}_3\text{--CH}_2\text{--OH}$. Each line represents a single bond; a double line would show a double bond.

Which type of bond is NOT present in a molecule of ethanol?

A C–C

B C–H

C C–O

D C=O (double bond)

10

REASONING — INTERPRET DNA EVIDENCE

All living things carry DNA. When tested, DNA shows as a series of black bands on a strip. The closer two living things are related, the more black bands they share in the same positions. The table below shows the number of bands shared between Adult Cat M and each kitten.

BANDS SHARED WITH ADULT CAT M (OUT OF 6 TOTAL BANDS)

KITTEN	BANDS SHARED WITH M
K1	5
K2	2
K3	3
K4	2

Which kitten is most likely to be Adult M's offspring?

A Kitten K1

B Kitten K2

C Kitten K3

D Kitten K4



Mathematics

Practice · 12 questions · ~18 minutes · No calculator

12

QUESTIONS

18

MINUTES

At Paper E level, Mathematics tests whole numbers, fractions, decimals, percentages, integers, angle rules, composite areas, data, and patterns — *without letter algebra*. Every question has a visual stimulus.

1

MEASURES & UNITS — INTERPRET A TIMETABLE

The timetable shows four stops on the Coastline Express train service.

COASTLINE EXPRESS TIMETABLE

STATION	ARRIVAL	DEPARTURE
Ashwell	—	08:40
Bridgetown	09:05	09:10
Carrington	09:30	09:35
Dunlop	10:05	—

A passenger boards at Bridgetown and travels to Dunlop. How long does this journey take?

A 30 min

B 55 min

C 60 min

D 1 h 25 min

2

GEOMETRY — CLASSIFY ANGLES

A triangle has interior angles of 30° , 100° and 50° . Which statement about this triangle is correct?

- ☐ A All three angles are acute.
- ☐ B There is exactly one obtuse angle.
- ☐ C There is exactly one right angle.
- ☐ D Two of the angles are obtuse.

3

NUMBER & ARITHMETIC — FIND A FRACTION OF A WHOLE

In a class of students, $\frac{2}{5}$ are studying music, and the rest are studying art. There are 18 students studying music.

How many students are studying art?

- | | |
|----------------------------|----------------------------|
| ☐ A 12 | ☐ B 27 |
| ☐ C 30 | ☐ D 45 |

4

NUMBER & ARITHMETIC — PERCENTAGE DISCOUNT

A jacket is marked at \$80. It is now on sale with 15% off. What is the sale price of the jacket?

- | | |
|------------------------------|------------------------------|
| ☐ A \$65 | ☐ B \$68 |
| ☐ C \$72 | ☐ D \$92 |

5

NUMBER & ARITHMETIC — INTEGERS AND DISTANCE

The expression $|A - B|$ gives the *distance* between numbers A and B on the number line. For example, if $A = -1$ and $B = 4$, then $|A - B| = |-5| = 5$. Which pair of values gives $|A - B| = 7$?

A $A = 2, B = 5$

B $A = -4, B = 3$

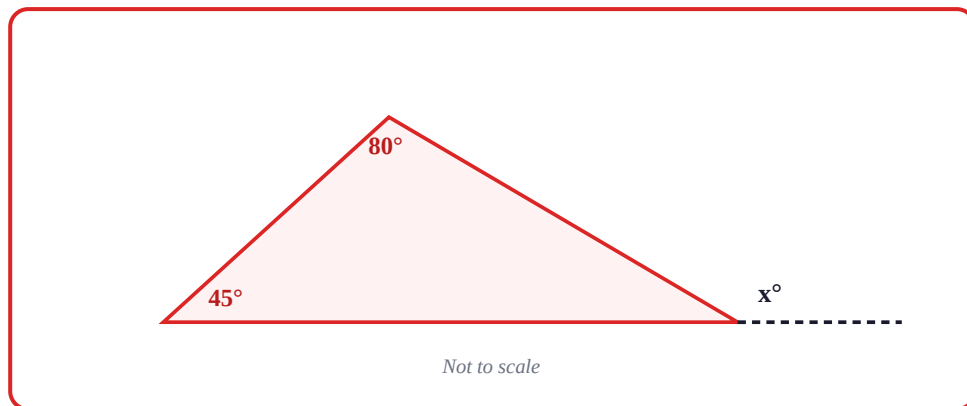
C $A = 1, B = 7$

D $A = 3, B = -3$

6

GEOMETRY — ANGLE CHAIN REASONING

In the figure below, a triangle has interior angles of 45° and 80° . One side has been extended to form a straight line, creating exterior angle x° .



What is the value of x ?

A 55°

B 100°

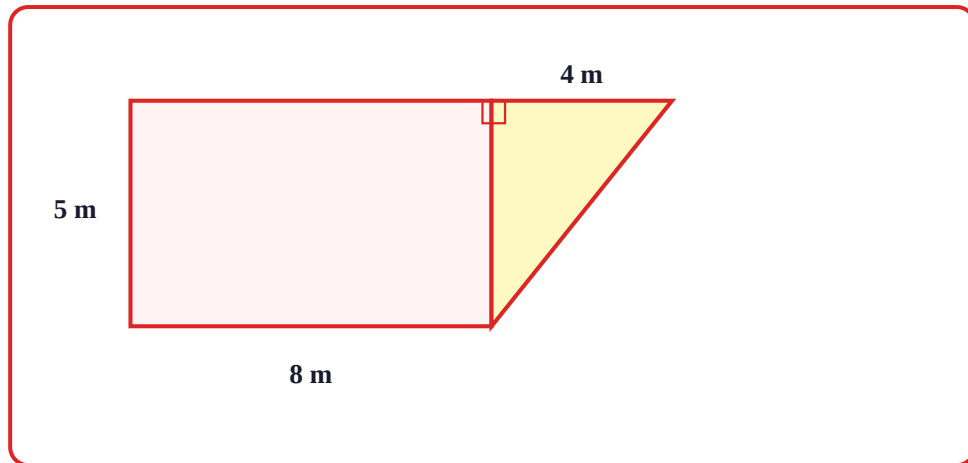
C 125°

D 135°

7

MEASUREMENT — COMPOSITE AREA

The diagram shows a garden plot made from a rectangle ($8\text{ m} \times 5\text{ m}$) and a right-angled triangle (base 4 m , height 5 m) joined along one side.



What is the total area of the garden plot?

A 40 m^2 B 45 m^2 C 50 m^2 D 60 m^2

8

CHANCE & DATA — MEAN WITH UNKNOWNNS

Yolanda chose six numbers. The mean of her six numbers was 10. Four of her numbers were 4, 8, 12 and 16. The other two numbers were *identical* to each other. What was the value of each of the identical numbers?

A 5

B 8

C 10

D 20

9

CHANCE & DATA — PROBABILITY AS PERCENTAGE

A bag contains 4 red marbles, 6 green marbles and 10 blue marbles. One marble is drawn at random. What is the probability, expressed as a percentage, that the marble drawn is red?

A 4%

B 20%

C 25%

D 40%

10

MEASURES & UNITS — MULTI-STEP CALCULATION

A delivery truck carries 1.2 tonnes of oranges. It delivers to 8 shops, giving each shop 130 kg of oranges. (Reminder: 1 tonne = 1000 kg.) How much of the oranges is left over after all eight deliveries?

A 40 kg

B 160 kg

C 200 kg

D 400 kg

11

ALGEBRA & PATTERNS — RELATED FRACTIONS

The numbers below form a pattern: $\frac{1}{48}$, $\frac{1}{24}$, $\frac{1}{12}$, $\frac{1}{6}$, $\frac{1}{3}$, ? What is the next term in the pattern?

A $\frac{1}{2}$ (one half)B $\frac{2}{3}$ (two thirds)

C 1

D $\frac{3}{2}$

12

NUMBER & ARITHMETIC — MULTI-CLUE REASONING

Mia picked two whole numbers greater than zero. She wrote three clues:

- Their **sum** is exactly 15.
- Their **product** is greater than 40 but less than 60.
- The first number is **smaller than** the second number.

How many different pairs of numbers could Mia have chosen?

A 2

B 3

C 4

D 5



Digital Technologies

Practice · 8 questions · ~8 minutes

8

QUESTIONS

8

MINUTES

Digital Technologies at Paper E covers spreadsheets, algorithms, flowcharts, coding logic, databases, and basic web/HTML concepts. All questions are multiple choice.

1

SPREADSHEETS — FORMULA VS STATIC VALUE

The spreadsheet below tracks sales data. Cell D4 contains the manually typed value 520 (not a formula). Cell D8 contains the formula `=SUM(D4:D7)`. A student changes the value in cell B4.

SALES SPREADSHEET

	A	B	C	D
3	Product	Units	Price (\$)	Revenue (\$)
4	Widget A	40	13	520 ← typed manually
5	Widget B	25	8	=B5*C5
6	Widget C	60	5	=B6*C6
7	Widget D	15	20	=B7*C7
8	Total Revenue			=SUM(D4:D7)

Which cell will not automatically update to reflect the new value in B4?

A D5

B D4

C D8

D All cells update automatically

2

CYBERSECURITY — IDENTIFY A THREAT AND RESPOND

Lily receives this email at school:

"Dear Student, your account has been compromised. Click here immediately and enter your username and password to secure it. — School IT Helpdesk"

The email was sent from: **it-helpdesk@schoolsecure99.net**

What is the safest action for Lily to take?

- A** Click the link and enter her details, because the email looks official.
- B** Reply to the email asking for proof of identity.
- C** Delete the email and report it to a trusted teacher or IT staff.
- D** Forward the email to all her classmates so they can check their accounts too.

3

ALGORITHMS — FLOWCHART SHAPES

A student is designing a flowchart to check whether a visitor is old enough to use a certain app. The flowchart needs a step that asks: "Is the user's age 13 or more?" and routes users to different outcomes depending on yes/no.

Which flowchart shape should be used for this step?

- | | |
|---------------------------------------|--|
| A Rectangle (process box) | B Rounded rectangle (start/end) |
| C Parallelogram (input/output) | D Diamond (decision) |

4

ALGORITHMS — TRACE BLOCK CODE

A sprite executes the following block code:

```
repeat 6 times
  move 50 steps
  turn 60 degrees clockwise
```

What shape does the sprite draw?

A equilateral triangle

B square

C regular hexagon

D regular pentagon

5

DATA — FILTER A TABLE WITH AND LOGIC

The table shows results from a school athletics carnival.

STUDENT	HOUSE COLOUR	PLACE	EVENT
Priya	Red	1st	100 m sprint
Marcus	Blue	1st	Long jump
Hannah	Red	1st	High jump
Ethan	Red	1st	400 m relay
Sanjay	Red	1st	Shot put
Lena	Green	2nd	100 m sprint

A filter is applied: House colour = Red AND Place = 1st. How many records are returned?

A 3

B 5

C 4

D 6

6

DATA — IDENTIFY A PRIMARY KEY

A school library database table has these fields: **Student_ID**, **First_Name**, **Last_Name**, **Year_Group**, **Books_Borrowed**. A primary key is a field that uniquely identifies every record in the table — no two records can share the same value in this field.

Which field is the most suitable primary key?

A Student_ID

B Last_Name

C Year_Group

D Books_Borrowed

7

PROGRAMMING — PREDICT HTML RENDERING

A student writes the following HTML:

```
<p>Lessons this week:</p>
<ul>
  <li><strong>Monday</strong></li>
  <li>Tuesday</li>
  <li><em>Wednesday</em></li>
</ul>
```

Which option correctly describes how this HTML will appear in a browser?

A A bullet list where "Monday" is bold, "Tuesday" is normal, and "Wednesday" is italic.

B A numbered list where all three days appear in bold.

C A bullet list where all three days are displayed in italics.

D A bullet list where "Monday" is italic and "Wednesday" is bold.

8

ALGORITHMS — SELECT CORRECT CONDITION

A library charges a \$2 fee for books returned up to and including 7 days late, and \$5 for books returned more than 7 days late. A programmer needs to code this using a variable called `days`. Which condition correctly gives the \$2 fee?

☐ A if `days < 7`☐ B if `days <= 7`☐ C if `days > 7`☐ D if `days = 7`

FULL WORKED ANSWERS

Answers & Explanations

For every question: the correct answer is shown in green, followed by the reasoning, and then why each wrong answer is incorrect.

Audit note: All questions independently verified correct, June 2026.

English — Questions 1–28

1 What does *pathological* mean in context?

✓ **Correct Answer: B — related to disease or illness**

The sentence contrasts a *pathological* change with damage caused by animals. In medicine, "pathological" means caused by or relating to disease. Context: bones that show pathological changes look like animal damage, suggesting both affect bone structure.

WHY THE OTHER OPTIONS ARE WRONG

- A** Dangerous or infectious describes a hazard, not a characteristic of bone changes.
- C** Age is not implied; bone age is mentioned separately in the article.
- D** "Made deliberately" is the opposite; pathological means arising from disease, not intention.

2 What is the main point of the third paragraph ('To the untrained eye...')?

✓ **Correct Answer: C — what looks ordinary to most people is rich with information to an expert**

The paragraph contrasts "any other" femur (untrained view) with a "sentence" full of clues (Voss's view). The writer is showing the gap between lay and expert perception.

WHY THE OTHER OPTIONS ARE WRONG

- A** The femur is used as a representative example, not because it is unusual.
- B** Good eyesight is not mentioned; it is knowledge and training that matters.
- D** Time in a lab is not mentioned; the contrast is about expertise, not exposure.

3

Why does the writer use a one-sentence paragraph near the end?

✓ **Correct Answer: B — It slows the reader and prepares them for Voss's final, quiet observation**

A short sentence between two longer passages of dialogue creates a pause. It functions like a stage direction: Voss pauses, looks down, then delivers her most reflective comment. Rhythm and pacing are key writer-craft tools.

WHY THE OTHER OPTIONS ARE WRONG

- A** No new scientific information is introduced by this sentence.
- C** There is no error to correct; the sentence is a narrative bridge.
- D** The sentence portrays focus, not fatigue.

4

Which is NOT given as something determinable from a single skeleton?

✓ **Correct Answer: C — the person's name**

The article explicitly states that the bones cannot give a name — "I can't tell you who they were." The other three (height, handedness, ancestry) are listed in paragraph 4.

WHY THE OTHER OPTIONS ARE WRONG

- A** "Approximate height" is explicitly listed in paragraph 4.
- B** "Right- or left-handed" is explicitly listed in paragraph 4.
- D** "Geographic ancestry" (from skull shape) is explicitly listed in paragraph 4.

5

Which quotation expresses the strongest certainty?

✓ **Correct Answer: B — 'The bones don't lie.'**

This is an absolute statement with no qualification. All other options include hedging words: "in some cases," "hints at," "often."

WHY THE OTHER OPTIONS ARE WRONG

- A** "In some cases" and "hints at" both weaken certainty significantly.
- C** "In some cases" is a qualifier meaning it does not always happen.
- D** "Often" means frequently, not always — it hedges the claim.

6

What does Voss's final comment reveal about her motivation?

✓ **Correct Answer: C — restoring dignity and recognition to people who have become anonymous**

Her comment that the person "was loved" and that her job is to "give them back some of what was taken" when they became anonymous directly shows her motivation is humanising the dead, not purely scientific achievement.

WHY THE OTHER OPTIONS ARE WRONG

- A** She does not compare methods; the article is not a scientific argument.
- B** She explicitly acknowledges she cannot provide a name — so identification is partial, not total.
- D** Her words are quiet and purposeful, not regretful or weary.

7

What is the writer's main purpose?

✓ **Correct Answer: B — to explain how forensic osteology works and convey its emotional significance**

The article combines factual explanation (what osteologists can determine) with human interest (Voss's voice, the final reflection on poverty and reality). Both dimensions are equally present.

WHY THE OTHER OPTIONS ARE WRONG

- A** There is no call to action or direct recruitment element.
- C** No comparison with other types of evidence is made.
- D** No specific case is described; the femur is a general example, not a solved case.

8

What does *paucity* mean in Hypatia's first response?

✓ Correct Answer: C — scarcity or shortage

Hypatia says the title says more about the paucity of records than about her. She means there are very few surviving records of women's work — a shortage, not an abundance.

WHY THE OTHER OPTIONS ARE WRONG

- A Accuracy describes quality, not quantity of records.
- B Abundance is the direct opposite of the intended meaning.
- D Importance relates to significance, not the quantity that is being described.

9

What does Hypatia's opening response indicate?

✓ Correct Answer: B — she disagrees with the way the title has been framed

She says she does "not feel particularly honoured" and immediately reframes the title as evidence of systemic erasure, not personal achievement. This is a disagreement with the framing, not pride or reluctance.

WHY THE OTHER OPTIONS ARE WRONG

- A She explicitly says she is not "particularly honoured" by the title.
- C She does discuss her achievements in subsequent answers; reluctance is not the theme here.
- D She is correcting the framing, not the fact. She does not dispute that she was a mathematician.

10

What does "cannot walk without first learning where others placed their feet" suggest?

✓ **Correct Answer: C — her work depended on the scholarship that came before her**

The metaphor uses walking as intellectual progress. "Others have placed their feet" = prior scholars. You cannot advance intellectually without standing on what was done before you.

WHY THE OTHER OPTIONS ARE WRONG

- A** The walking is a metaphor for intellectual learning, not physical practice.
- B** The comparison distinguishes mathematics from literal walking.
- D** She does not compare the two scholars to each other in this passage.

11

What is the effect of 'not to invent a new theorem every Tuesday'?

✓ **Correct Answer: B — it gently mocks the idea that scholarship must constantly produce something new**

"Every Tuesday" is humorously specific and mundane — it satirises the pressure for constant novelty. Hypatia is arguing that explanation and clarification are equally valid scholarly acts.

WHY THE OTHER OPTIONS ARE WRONG

- A** There is no historical practice of Tuesday theorem-writing; this is a modern-sounding idiom.
- C** No specific event in her life is referenced here.
- D** There is no suggestion it comes from Euclid.

12

Why did Hypatia continue to teach during unrest?

✓ Correct Answer: C — she believed silence was worse than the risk of speaking

She states directly: "I continued to teach because I believed the alternative — silence — was worse." This is a clear, explicit statement of motivation.

WHY THE OTHER OPTIONS ARE WRONG

- A Her livelihood is never mentioned as a factor.
- B Students' wishes are not described; the decision was Hypatia's own.
- D She was clearly aware: "I had seen enough riots in Alexandria."

13

What does 'turmoil' mean?

✓ Correct Answer: B — upheaval

Turmoil refers to a state of great disturbance, confusion or disorder — exactly the political and religious upheaval described in Alexandria during Hypatia's time.

WHY THE OTHER OPTIONS ARE WRONG

- A Silence is the opposite of the noisy disruption implied.
- C Celebration implies positive excitement; turmoil is disruptive and threatening.
- D Tradition implies continuity; turmoil implies disruption of that continuity.

14

What is Hypatia's central message across the interview?

✓ Correct Answer: C — careful thinking is deeply practical and worth defending

Her final answer makes this explicit: philosophy is "simply the practice of thinking carefully," and a person who does not value it "is at the mercy of anyone who does." This thread runs through all her answers.

WHY THE OTHER OPTIONS ARE WRONG

- A She explicitly downplays personal status in her first answer.
- B Greek philosophy specifically is not argued for — she speaks of "careful thinking" as a universal practice.
- D Library protection is mentioned, but as a passing image, not a central argument.

15 What does *unfamiliar* mean in context?

✓ Correct Answer: B — a feeling Amara had not experienced before

The full phrase is "something warm and unfamiliar" — an emotion that surprised her because she hadn't felt quite this combination before (being simultaneously seen and forgiven).

WHY THE OTHER OPTIONS ARE WRONG

- A Foreign/from another country is a different meaning of "unfamiliar"; here it is used emotionally.
- C The feeling is described as "warm," not cold.
- D Painful and confusing contradicts the "warm" qualifier.

16 What does "which was worse" reveal about Amara?

✓ Correct Answer: C — she would have preferred Naomi to confront her directly

Amara distinguishes between Naomi not noticing and Naomi choosing not to say anything. The second option is "worse" — suggesting she'd rather face explicit confrontation than be left with knowing she was noticed but not addressed.

WHY THE OTHER OPTIONS ARE WRONG

- A Amara does not suggest Naomi behaved badly — she is processing her own guilt.
- B She does not judge Naomi for slowness; she suspects Naomi noticed everything.
- D Provoking an argument is not part of Amara's motive — she feels guilty, not combative.

17

What does the torn lining detail suggest about the family?

✓ **Correct Answer: B — small, unfulfilled promises that accumulate, but life carries on**

The lining has been promised a repair "three years in a row" and now abandoned. This is a gentle image of minor domestic neglect — the kind of thing families live with without drama. It humanises the family without judgement.

WHY THE OTHER OPTIONS ARE WRONG

- A** Owning many coats is not implied; the single grey coat is valued precisely.
- C** There is no mention of throwing the coat away; the mother has "abandoned" the repair, not the coat.
- D** The detail is nostalgic and gentle, not a sign of conflict.

18

What does "pretending to be taller" convey about wearing the coat?

✓ **Correct Answer: C — Amara felt she was inhabiting an identity that did not quite fit**

"Pretending to be taller" suggests putting on something that gives you a stature that isn't naturally yours. The coat is Naomi's — it carries Naomi's identity — and Amara is performing a version of herself she isn't quite yet.

WHY THE OTHER OPTIONS ARE WRONG

- A** The literal length of the coat is never mentioned.
- B** Their relative heights are not mentioned in the text.
- D** There is no evidence of Amara deceiving someone outside; the deception is small and internal.

19

What does 'careful precision of someone attempting to make a lie look ordinary' convey?

✓ **Correct Answer: B — Amara is conscious of her small deception and feels the weight of it**

The word "precision" shows effort; "attempting" shows the lie is not quite natural. This is not the action of a habitual liar — it is someone acutely aware of doing something slightly wrong.

WHY THE OTHER OPTIONS ARE WRONG

- A** "Attempting to make a lie look ordinary" suggests this is effortful — not the easy act of an experienced liar.
- C** Naomi is at the table focused on her work; she is not described as watching Amara.
- D** The lining is mentioned earlier; the coat hanging is about guilt, not physical care.

20

Which underlined word is NOT used as a verb in the sentence?

✓ **Correct Answer: C — concentrated**

"Concentrated" is an adjective modifying the noun "frown" — it describes what kind of frown it is. The other three words function as verbs: "writing" (was writing), "worn" (had worn), and "looking" (participial phrase = doing-verb).

WHY THE OTHER OPTIONS ARE WRONG

- A** "Writing" is part of the continuous verb phrase "was writing."
- B** "Worn" is part of the perfect verb phrase "had worn."
- D** "Looking" functions as a present participle in the verbal phrase "looking down at her page."

21

Why does Naomi say 'The coat smells of cold air' instead of accusing Amara?

✓ **Correct Answer: B — she uses an indirect, gentle opening for a potentially difficult conversation**

The observation is factual and non-accusatory — it lets Amara know she was noticed without confrontation. It opens a door rather than slamming one. This is consistent with Naomi's character as someone focused and precise, yet kind.

WHY THE OTHER OPTIONS ARE WRONG

- A** Naomi's response — and the offer to lend the coat again — shows she has definitely noticed.
- C** Nothing in the text suggests Naomi fears Amara.
- D** Naomi does not look up; she is not distracting Amara — she is the one studying.

22

What does the extract suggest about the sisters' relationship?

✓ **Correct Answer: C — they communicate meaningful things through small, understated exchanges**

The entire story hinges on an unspoken borrowing, a quiet observation ("The coat smells of cold air"), and a three-word ending ("Just ask.") — all enormous emotional content delivered with minimum words. Understated communication is the theme.

WHY THE OTHER OPTIONS ARE WRONG

- A** The exchange is warm, not hostile; Naomi offers to lend the coat in future.
- B** Amara's curiosity is about identity (the coat), not envy of Naomi's academic work.
- D** Naomi is the one who forgives and offers; this is kindness, not control.

23

Best phrase for blank (23): how names were passed on

✓ Correct Answer: B — in a tradition stretching back centuries

The phrase completes the idea that the oral tradition has deep historical roots. "In a tradition stretching back centuries" fits grammatically (prepositional phrase after "passed on from...to...") and meaningfully (emphasising age and continuity).

WHY THE OTHER OPTIONS ARE WRONG

- A "For reasons nobody quite remembers" contradicts the article's tone of purposeful oral tradition.
- C "Because they cost nothing" is true but trivial and doesn't fit the register of the passage.
- D "While map-makers ignored them" introduces a contrast not established in this sentence.

24

Best phrase for blank (24): after mentioning the drowned landlord

✓ Correct Answer: C — and the name had stuck ever since

The sentence describes how a name originated (drowning of landlord) and (24) explains why it persisted. "The name had stuck ever since" logically follows: the event created the name, and it endured.

WHY THE OTHER OPTIONS ARE WRONG

- A "Even though the water looked calm" introduces a contrast that belongs to the name's warning function, not its origin.
- B "Although nobody could remember why" contradicts the article — they clearly do remember the drowning.
- D "While the surveyors were still working" introduces a temporal clash with the 1850 setting.

25

Best connective for blank (25): old names not recorded → old knowledge slipping away

✓ **Correct Answer: B — As a result**

The relationship is cause-and-effect: because names are not recorded (cause), the knowledge is lost (effect). "As a result" is the correct connective for this relationship.

WHY THE OTHER OPTIONS ARE WRONG

- A** "Despite this" signals contrast/concession, but there is no contrast here — the ideas flow in the same direction.
- C** "On the other hand" signals contrast between two different positions.
- D** "In contrast" also signals opposition rather than consequence.

26

Best phrase for blank (26): what linguists think the names may do

✓ **Correct Answer: C — contain a kind of practical knowledge that is not easily replaced**

This follows "some linguists have suggested that these lost river-names may..." and must be a plausible, positive claim about what the names hold. The rest of the sentence confirms this: "recording information about currents, hazards and seasonal changes."

WHY THE OTHER OPTIONS ARE WRONG

- A** "Have always been made up" contradicts the article's argument that names are meaningful warnings.
- B** "Never really have existed" contradicts the examples given just before this paragraph.
- D** "Listed in modern atlases" is a proposed solution, not what the names themselves may contain.

27

Best clause for blank (27): describes the practical knowledge lost

✓ Correct Answer: B — that took many generations to accumulate

The blank follows "a small loss of practical knowledge" — it must be a relative clause modifying "knowledge." "That took many generations to accumulate" correctly qualifies the knowledge and reinforces the article's theme of slow, irreplaceable build-up of understanding.

WHY THE OTHER OPTIONS ARE WRONG

- A "Although rivers themselves never change" is factually wrong (rivers do change) and contradicts the article.
- C "Since the industrial revolution began" is a plausible time marker but doesn't modify "knowledge" in a meaningful way here.
- D "Written down in ordinary English" is an action, not a description of the knowledge itself.

28

Best phrase for blank (28): what the rivers will lack in future

✓ Correct Answer: C — to name them in the old way

The sentence concludes: "there will be no one left (28)" — meaning the tradition of naming will be lost. "To name them in the old way" directly echoes the article's central concern about the loss of oral river-naming traditions.

WHY THE OTHER OPTIONS ARE WRONG

- A "Still interested in rivers at all" is too extreme — the article doesn't suggest general disinterest, only loss of the naming tradition.
- B "Who can measure them accurately" is about surveying, a different activity from naming.
- D "To do the work of historians" is vague and doesn't connect to the river-naming theme.



S1

Likely pH of Solution S (more acidic than Q=6.5, less acidic than P=3.0)

✓ Correct Answer: B — between 3.0 and 6.5

Lower pH = more acidic. "More acidic than Q" means $\text{pH} < 6.5$. "Less acidic than P" means $\text{pH} > 3.0$. So $3.0 < \text{pH} < 6.5$.

WHY THE OTHER OPTIONS ARE WRONG

- A $\text{pH} < 3.0$ would be more acidic than P, contradicting the clue.
- C $\text{pH} 6.5\text{--}9.0$ would be less acidic than Q, contradicting the clue.
- D $\text{pH} > 9.0$ is alkaline — opposite of the acidic range described.

S2

Which animal in the food web is an omnivore?

✓ Correct Answer: C — fox

The fox eats berries (plant), rabbits (animal), and birds (animal). It consumes both plant and animal material, making it an omnivore by definition.

WHY THE OTHER OPTIONS ARE WRONG

- A The rabbit eats only grass — it is a herbivore.
- B The frog eats only beetles — it is a carnivore.
- D The hawk eats only frogs and foxes — it is a carnivore.

S3**Was Zara's investigation a fair test?**

✓ **Correct Answer: D — No; pots were in different environments, so other variables changed**

The independent variable should be fertiliser type only. By placing pots in a sunny windowsill, dark garage, and outdoor garden, Zara changed light, temperature, and humidity simultaneously. These are uncontrolled variables that invalidate the test.

WHY THE OTHER OPTIONS ARE WRONG

- A** Using the same seed variety is a positive control, but it doesn't overcome the environment problem.
- B** Same time period is also a positive control measure, but again doesn't overcome the uncontrolled variables.
- C** Not repeating is a limitation, but the fundamental problem is the uncontrolled environment, not sample size.

S4**Which season had these readings: midnight≈10°C, 6am≈8°C, noon≈17°C, 6pm≈14°C?**

✓ **Correct Answer: C — Autumn**

Comparing all four values: the Autumn row in the table is exactly midnight=10, 6am=8, noon=17, 6pm=14 — a perfect match.

WHY THE OTHER OPTIONS ARE WRONG

- A** Spring values are 13, 11, 21, 17 — consistently higher.
- B** Summer values are 22, 18, 29, 24 — much higher.
- D** Winter values include negatives (−2, −5), far below the observed data.

S5**What inference can scientists draw from the 15% size difference alone?**

✓ **Correct Answer: C — there is a difference between the two populations that affects body size**

This is the only statement directly supported by the data: a size difference exists. Anything beyond this (cause, lifespan, food supply) requires additional evidence not provided.

WHY THE OTHER OPTIONS ARE WRONG

- A** More food is one possible cause, but the observation alone does not confirm it — similar diets were noted.
- B** Different species is a much stronger claim requiring genetic evidence, not just size data.
- D** Longevity is not measured or implied by the data given.

S6**W and Y glow; X and Z are dark — which are conductors?**

✓ **Correct Answer: A — W and Y are conductors; X and Z are insulators**

A glowing bulb means current is flowing, so the unknown object in that branch must be allowing current through — it is a conductor. Dark bulb = no current = insulator.

WHY THE OTHER OPTIONS ARE WRONG

- B** X and Z correspond to dark bulbs, meaning no current flows — they are insulators, not conductors.
- C** If all were conductors, all four bulbs would glow.
- D** The glow/dark pattern provides clear evidence; it is not impossible to determine.

S7**Coarse-grained + low silica = which volcanic rock?**

✓ **Correct Answer: C — gabbro**

Reading the table: Coarse-grained row, Low Silica column = gabbro. This is a straightforward table-reading task.

WHY THE OTHER OPTIONS ARE WRONG

- A** Basalt is fine-grained and low silica — wrong grain size.
- B** Diorite is coarse-grained but medium silica — wrong silica level.
- D** Scoria is vesicular (bubbly) and low silica — wrong grain type.

S8**Runner speed: at 100 m (t=20 s) to 160 m (t=40 s)****✓ Correct Answer: C — 3 m/s**

Distance = 160 – 100 = 60 m. Time = 40 – 20 = 20 s. Speed = 60 ÷ 20 = 3 m/s.

WHY THE OTHER OPTIONS ARE WRONG

- A** 1 m/s would require only 20 m in 20 s — misreading the position difference.
- B** 2 m/s comes from using 40 m distance (the time elapsed) instead of the actual 60 m.
- D** 5 m/s comes from dividing the starting position (100 m) by the time (20 s), forgetting to subtract positions first.

S9**Which bond is NOT in ethanol (CH₃–CH₂–OH)?****✓ Correct Answer: D — C=O (double bond)**

Ethanol's structure CH₃–CH₂–OH contains only single bonds: C–C, C–H, C–O (single), and O–H. A C=O double bond is the hallmark of aldehydes and carboxylic acids, not alcohols.

WHY THE OTHER OPTIONS ARE WRONG

- A** C–C is present between the two carbon atoms.
- B** C–H bonds are present on both carbon atoms (3 on CH₃, 2 on CH₂).
- C** C–O (single bond) is present where the –OH group attaches to the carbon chain.

S10**Which kitten is most likely Adult M's offspring?****✓ Correct Answer: A — Kitten K1**

K1 shares 5 out of 6 bands with M — the highest match. A parent and offspring should share roughly half their DNA bands; 5/6 strongly indicates K1 is M's offspring.

WHY THE OTHER OPTIONS ARE WRONG

- B** K2 shares only 2/6 — a low match, suggesting a distant or no relationship.
- C** K3 shares 3/6 — moderate match, but less than K1.
- D** K4 shares only 2/6 — same low match as K2.

M1 Bridgetown (depart 09:10) to Dunlop (arrive 10:05) — how long?

✓ **Correct Answer: B — 55 min**

From 09:10 to 10:05: add 50 min to get 10:00, then 5 more minutes = 55 minutes total.

WHY THE OTHER OPTIONS ARE WRONG

- A** 30 min would give 09:40, not 10:05.
- C** 60 min would give 10:10, not 10:05.
- D** 1h 25 min = 85 min from 09:10 = 10:35, far too late. Common error: using arrival at Bridgetown (09:05) instead of departure (09:10).

M2 Triangle with 30° , 100° , 50° — which statement is correct?

✓ **Correct Answer: B — there is exactly one obtuse angle (100°)**

Obtuse means greater than 90° . Only 100° exceeds 90° ; 30° and 50° are both acute. Sum check: $30 + 100 + 50 = 180$ ✓

WHY THE OTHER OPTIONS ARE WRONG

- A** 100° is obtuse, not acute; so not all angles are acute.
- C** There is no right angle (90°) in this triangle.
- D** Only one angle (100°) is obtuse; 30° and 50° are acute.

M3 $2/5$ of class do music = 18 students; how many do art?

✓ **Correct Answer: B — 27**

If $2/5 = 18$ students, then $1/5 = 9$ students, so the whole class = $5 \times 9 = 45$ students. Art = $3/5 \times 45 = 27$ students.

WHY THE OTHER OPTIONS ARE WRONG

- A** $12 = 18 \times 2/3$, which uses the wrong fraction operation.
- C** $30 = 18 + 12$, an incorrect approach.
- D** 45 is the total class size, not the number doing art.

M4 \$80 jacket with 15% discount — sale price?

✓ **Correct Answer: B — \$68**

15% of \$80 = $0.15 \times 80 = \$12$ discount. Sale price = $\$80 - \$12 = \$68$.

WHY THE OTHER OPTIONS ARE WRONG

A $\$65 = \$80 - \$15$. This uses 15 as a dollar amount, not 15% of \$80.

C $\$72 = \$80 - \$8$. This uses 10% instead of 15%.

D $\$92 = \$80 + \$12$. This adds the discount instead of subtracting it.

M5 Which pair gives $|A - B| = 7$?

✓ **Correct Answer: B — $A = -4$, $B = 3$**

$|-4 - 3| = |-7| = 7$ ✓. Check others: $|2 - 5| = 3$, $|1 - 7| = 6$, $|3 - (-3)| = 6$.

WHY THE OTHER OPTIONS ARE WRONG

A $|2 - 5| = 3$, not 7.

C $|1 - 7| = 6$, not 7.

D $|3 - (-3)| = 6$, not 7. Common error: forgetting that subtracting a negative adds.

M6 Triangle with interior angles 45° and 80° — find exterior angle x°

✓ **Correct Answer: C — 125°**

By the Exterior Angle Theorem: an exterior angle equals the sum of the two non-adjacent interior angles. $x = 45^\circ + 80^\circ = 125^\circ$. Alternatively: third interior angle = $180^\circ - 45^\circ - 80^\circ = 55^\circ$; exterior angle $x = 180^\circ - 55^\circ = 125^\circ$.

WHY THE OTHER OPTIONS ARE WRONG

A 55° is the third interior angle at the vertex, not the exterior angle.

B 100° does not follow from any correct application of angle rules here.

D $135^\circ = 90^\circ + 45^\circ$, a common slip from mistakenly treating one angle as a right angle.

M7**Composite area: rectangle 8×5 plus right triangle base 4, height 5****✓ Correct Answer: C — 50 m²**

Rectangle = $8 \times 5 = 40 \text{ m}^2$. Triangle = $\frac{1}{2} \times 4 \times 5 = 10 \text{ m}^2$. Total = $40 + 10 = 50 \text{ m}^2$.

WHY THE OTHER OPTIONS ARE WRONG

- A** 40 m² counts only the rectangle, ignoring the triangle.
- B** $45 \text{ m}^2 = 40 + 5$. This halves the triangle correctly but uses base 2 instead of 4, or makes another arithmetic slip.
- D** $60 \text{ m}^2 = 40 + 20$. This counts the triangle as a full rectangle ($4 \times 5 = 20$) without halving.

M8**Mean of 6 numbers = 10; four known: 4, 8, 12, 16; two identical unknowns****✓ Correct Answer: C — 10**

Total of all 6 numbers = $6 \times 10 = 60$. Sum of known four = $4 + 8 + 12 + 16 = 40$. Sum of two unknowns = $60 - 40 = 20$. Since they are equal: each = $20 \div 2 = 10$.

WHY THE OTHER OPTIONS ARE WRONG

- A** 5 — This halves the sum of the four known numbers instead of working from the total.
- B** 8 — A tempting distractor (the mean of some subsets), but doesn't check out: $4+8+12+16+8+8=56 \neq 60$.
- D** 20 is the combined value of both unknowns, not each one individually.

M9**P(red marble) from bag with 4 red, 6 green, 10 blue — as a %****✓ Correct Answer: B — 20%**

Total marbles = $4 + 6 + 10 = 20$. $P(\text{red}) = 4/20 = 1/5 = 20\%$.

WHY THE OTHER OPTIONS ARE WRONG

- A** 4% treats the count of red as the percentage, ignoring the total.
- C** $25\% = 4/16$, dividing by 16 instead of 20 (missing the 4 red from total).
- D** $40\% = 8/20$, doubling the count of red marbles.

M10 1.2 tonnes – 8×130 kg = how much left over?

✓ **Correct Answer: B — 160 kg**

1.2 tonnes = 1200 kg. Delivered = $8 \times 130 = 1040$ kg. Left over = $1200 - 1040 = 160$ kg.

WHY THE OTHER OPTIONS ARE WRONG

- A** 40 kg — This uses $1.2 \times 100 = 120$ deliveries instead of converting tonnes correctly.
- C** 200 kg — From $1200 - 1000$ (using 8×125 or forgetting to multiply 8×130).
- D** 400 kg — From $1200 - 800$ (using 8×100 , not 8×130).

M11 Pattern: $1/48, 1/24, 1/12, 1/6, 1/3, ?$ — what is next?

✓ **Correct Answer: B — $2/3$**

Each term doubles the previous (denominator halves): $48 \rightarrow 24 \rightarrow 12 \rightarrow 6 \rightarrow 3 \rightarrow 1.5$. So next term = $1/1.5 = 2/3$.

WHY THE OTHER OPTIONS ARE WRONG

- A** $1/2$ — Not in the doubling pattern; $1/3 \times 2 = 2/3$, not $1/2$.
- C** 1 — Two steps ahead in the pattern ($1/3 \rightarrow 2/3 \rightarrow 4/3$, not 1).
- D** $3/2$ — Three steps ahead of the correct position.

M12 Two positive whole numbers, sum=15, product between 40 and 60 exclusive, first < second — how many pairs?

✓ **Correct Answer: C — 4 pairs**

All pairs summing to 15 with first < second: $(1,14) \rightarrow 14, (2,13) \rightarrow 26, (3,12) \rightarrow 36, (4,11) \rightarrow 44\checkmark, (5,10) \rightarrow 50\checkmark, (6,9) \rightarrow 54\checkmark, (7,8) \rightarrow 56\checkmark$. Four pairs have products in $40 < P < 60$: $(4,11), (5,10), (6,9), (7,8)$.

WHY THE OTHER OPTIONS ARE WRONG

- A** 2 — Too few; likely from only checking pairs near the middle.
- B** 3 — Missing one valid pair, often $(7,8)$ with product 56.
- D** 5 — Includes a pair outside the range, e.g. $(3,12)$ with product 36 which is < 40.

D1 D4 is a manually typed value; B4 changes — which cell doesn't auto-update?

✓ **Correct Answer: B — D4**

D4 = 520 is typed manually (a static value). Changing B4 does not affect D4 since D4 contains no formula referencing B4. D8 (=SUM(D4:D7)) uses the old D4 value, so it also won't reflect the change — but D4 is the direct answer since it's the manually typed cell that "won't update."

WHY THE OTHER OPTIONS ARE WRONG

- A** D5 = B5*C5, which does not reference B4, so it also doesn't update. However D4 is the specific static cell that is the root of the problem.
- C** D8 uses =SUM(D4:D7). Since D4 is static, D8 uses the unchanged D4 value — but D4 is the fundamental issue.
- D** Not all cells update — D4 is static.

D2 Suspicious email asking for login details — safest action?

✓ **Correct Answer: C — delete/report and contact a trusted teacher or IT staff**

The email shows classic phishing signs: urgency ("immediately"), request for credentials, and a suspicious domain ("schoolsecure99.net" rather than the school's own domain). Reporting to a trusted adult is the correct and safe response.

WHY THE OTHER OPTIONS ARE WRONG

- A** Clicking the link hands credentials directly to the attacker.
- B** Replying to a phishing email confirms the address is active and may expose more information.
- D** Forwarding spreads potential malware or phishing links to more people.

D3**A yes/no decision step in a flowchart needs which shape?****✓ Correct Answer: D — diamond (decision)**

In standard flowchart notation, a diamond represents a decision point — a question with two or more exit paths (typically yes/no or true/false). This is the universal symbol for branching logic.

WHY THE OTHER OPTIONS ARE WRONG

- A** A rectangle is a process box — for actions like "Calculate total" or "Set variable."
- B** A rounded rectangle (oval) marks the start or end of a flowchart.
- C** A parallelogram represents input/output — e.g., "Display result" or "Read user input."

D4**Repeat 6× (move 50, turn 60°) — what shape is drawn?****✓ Correct Answer: C — regular hexagon**

6 equal sides (50 steps each) and 6 turns of 60° = total turning of 360°, which closes the shape. A closed shape with 6 equal sides and 6 equal angles is a regular hexagon. Interior angle = $180^\circ - 60^\circ = 120^\circ$, which matches a regular hexagon.

WHY THE OTHER OPTIONS ARE WRONG

- A** Equilateral triangle needs 3 sides and 3 turns of 120° each.
- B** Square needs 4 sides and 4 turns of 90° each.
- D** Pentagon needs 5 sides and 5 turns of 72° each.

D5**Filter: House = Red AND Place = 1st — how many records?****✓ Correct Answer: C — 4**

Applying both conditions: Priya (Red, 1st ✓), Hannah (Red, 1st ✓), Ethan (Red, 1st ✓), Sanjay (Red, 1st ✓). Marcus (Blue) and Lena (Green, 2nd) are excluded. Total = 4 records.

WHY THE OTHER OPTIONS ARE WRONG

- A** 3 — Undercounts; misses one Red/1st student.
- B** 5 — Overcounts Red students (4 are Red/1st, 1 is Red but different place or missed the AND condition).
- D** 6 — The total number of rows, ignoring both filters.

D6 Which field is the best primary key in the library table?

✓ **Correct Answer: A — Student_ID**

A primary key must be unique for every record. Student_ID is specifically designed to be unique to each student. The other fields can repeat: multiple students may share a last name, year group, or number of books borrowed.

WHY THE OTHER OPTIONS ARE WRONG

- B** Last_Name is not unique — many students may share a surname.
- C** Year_Group contains the same value for all students in the same year.
- D** Books_Borrowed changes over time and can be the same for many students.

D7 HTML rendering: `<strong>Monday</strong>`, Tuesday, `<em>Wednesday</em>`

✓ **Correct Answer: A — Monday bold, Tuesday normal, Wednesday italic**

`<strong>` renders text as bold. `<em>` renders text as italic. `<ul>/<li>` creates a bullet (unordered) list. "Tuesday" has no tags, so it appears in normal weight.

WHY THE OTHER OPTIONS ARE WRONG

- B** `<ul>` is unordered (bullets), not numbered; and not all text is bold.
- C** Only Wednesday uses `<em>` for italic; Monday and Tuesday are not italic.
- D** The tags are reversed: `<strong>` = bold (Monday), `<em>` = italic (Wednesday).

D8 Library fee: up to AND including 7 days = \$2; more than 7 days = \$5 — correct condition for \$2?

✓ **Correct Answer: B — if days <= 7**

"Up to and including 7 days" means days can be 1, 2, 3, 4, 5, 6, or 7. The condition $\text{days} \leq 7$ (less than or equal to 7) captures all of these. The key word is "including."

WHY THE OTHER OPTIONS ARE WRONG

- A** if days < 7 excludes day 7, which should receive the \$2 fee per the rule.
- C** if days > 7 is the condition for the \$5 fee, not the \$2 fee.
- D** if days = 7 only captures exactly 7 days — it excludes days 1 through 6.

Writing — Tasks 1 & 2 Marking Rubric

Use these criteria to self-assess your writing. Aim for **3–4 marks** in each category before moving on.

IDEAS & CONTENT (OUT OF 4)

- **4:** Clear position/narrative, detailed and specific, all prompt requirements met.
- **3:** Position/story present, some detail, most requirements met.
- **2:** Basic ideas only, some requirements missing.
- **1:** Partial or unfocused.

STRUCTURE & ORGANISATION (OUT OF 4)

- **4:** Clear intro, well-ordered middle, strong conclusion. Logical progression.
- **3:** Mostly organised with minor jumps.
- **2:** Some structure, but sections unclear or jumbled.
- **1:** Little visible structure.

LANGUAGE & STYLE (OUT OF 4)

- **4:** Varied, precise vocabulary. Sentences varied in length. Tone consistent.
- **3:** Mostly varied. Some effective word choices.
- **2:** Simple vocabulary, repetitive sentences.
- **1:** Very limited language range.

YOUR SCORE

Add your three scores out of 4 for a total out of 12. In real ICAS Writing, the marking is holistic — but practising against criteria like these gives you the clearest feedback on where to improve.