General Achievement Test

Section B – Question Book

Tuesday 18 June 2024

- Reading time is **15 minutes**: 1.15pm to 1.30pm
- Writing time is **1 hour 30 minutes**: 1.30pm to 3.00pm

Approved materials

- An English and/or bilingual dictionary and one scientific calculator

Materials supplied

- Question Book of 36 pages
- Answer Book including a Multiple-Choice Answer Page

Instructions

- Follow the instructions on the front page of your Answer Book.

Students are **not** permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

Contents

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

VICTORIA State Government

Writing Task

Complete this task in the space provided in your Answer Book.

It is recommended that you spend up to 30 minutes completing this task.

Use **one OR more** of the prompts to develop a piece of writing presenting your point of view.

Your writing will be judged on your ideas, how well you organise and present your point of view, and how effectively you express yourself.

I

Creativity is essential if we are to avoid uniformity.

II

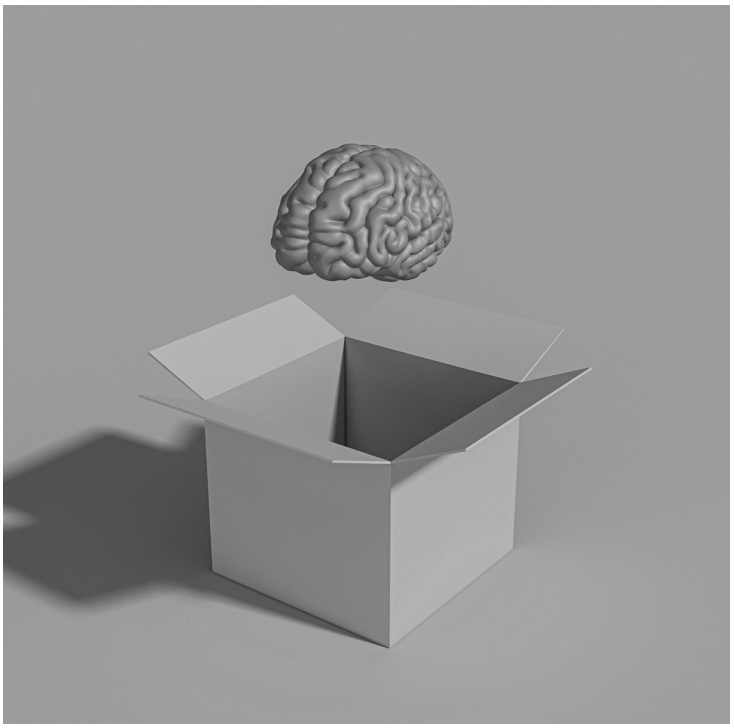
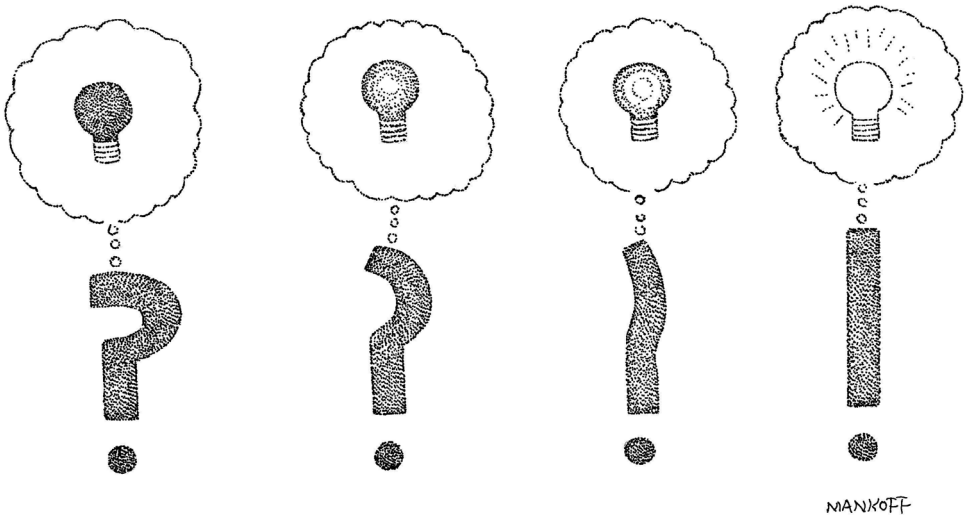


Image by Panther Media

III

Creative people always build on the ideas of others.

IV



Cartoon by Bob Mankoff

End of Writing Task

Multiple-Choice Questions

- It is recommended that you spend up to 60 minutes on this task.
- Answer **all** questions in pencil on the Multiple-Choice Answer Page (page 7) of the Answer Book.
- Choose the response that is **correct** or that **best answers** the question.
- A correct answer scores 1; an incorrect answer scores 0.
- Marks will **not** be deducted for incorrect answers.
- No marks will be given if more than one answer is completed for any question.

Questions 1–4

The following comments are from a documentary about architecture.

I. Good architecture stimulates people; it makes people react. It captivates people. It makes contact with people. They may not like it, they may hate it, but at least it stimulates their thoughts about that particular building, and maybe buildings and urban design more generally.

II. Why are you uncomfortable with a building that you don't like? The answer is probably because you don't understand it.

III. It is often the case that things appear ugly because we're not used to them, or they're a bit different from our expectations at a particular time.

IV. I think something ugly is just as worthy of preservation as something beautiful. I think there's also an established view of what beauty is and what is worthy of preservation, which tends to be limited.

V. Architecture ... must be like an onion, where you take one layer off and there is another layer and yet another layer and another layer, so it must be operating at many levels. It can't simply be texture on a facade.

1 Which comment implies that architects face many challenges in their work?

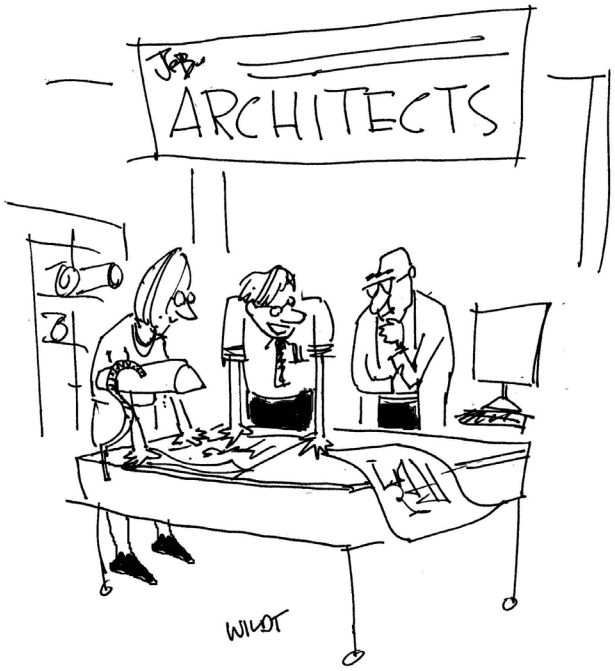
A. II
B. III
C. IV
D. V

2 Comments III and IV suggest that appreciating architecture requires

A. an open mind.
B. a vivid imagination.
C. attention to detail.
D. willingness to listen to experts.

3 Comment IV suggests that conventional ideas of architectural beauty are

A. relatively fixed.
B. quite easily manipulated.
C. at the heart of all judgments about buildings.
D. a reliable guide to judging whether a building is worth preserving.



"Sure, it will be an eyesore, but after we build a lot of them, it'll fit right in!"

Cartoon by Chris Wildt

4 This cartoon presents a cynical twist on the ideas expressed in

A. Comment I.
B. Comment II.
C. Comment III.
D. Comment V.

Questions 5–7

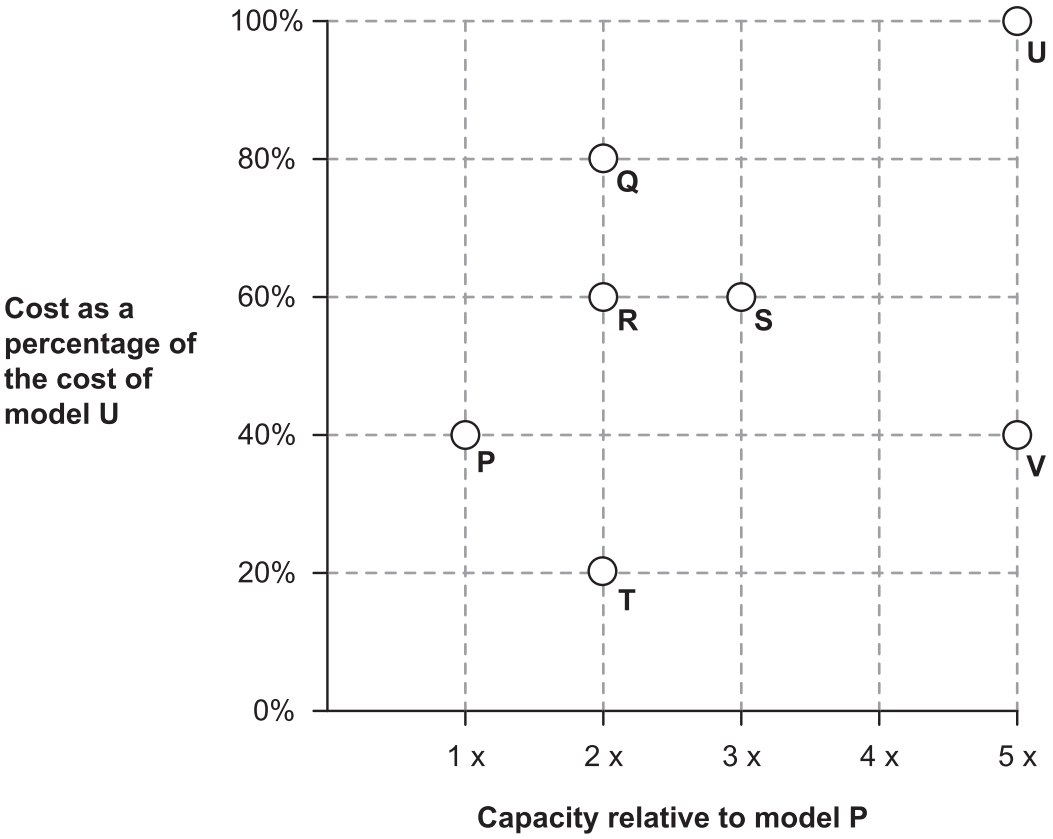
Amanda wants to buy a new hard drive for her computer.

She is investigating 7 models (**P**, **Q**, **R**, **S**, **T**, **U**, **V**).

She has plotted the relative capacity and cost of each model on the graph below.

The capacity of each model is given relative to the capacity of model **P**.

The cost of each model is given as a percentage of the cost of model **U**.



For example, **S** has three times the capacity of **P** and its cost is 60% of the cost of model **U**.

5 The capacity of a model is measured in gigabytes.

Which model has the lowest cost per gigabyte?

A. **P**
B. **Q**
C. **T**
D. **V**

6 Which model is closest to the average cost and average capacity of all seven models?

A. **Q**
B. **R**
C. **S**
D. **V**

7 Amanda's previous model had a capacity of 1 024 gigabytes and cost $200.

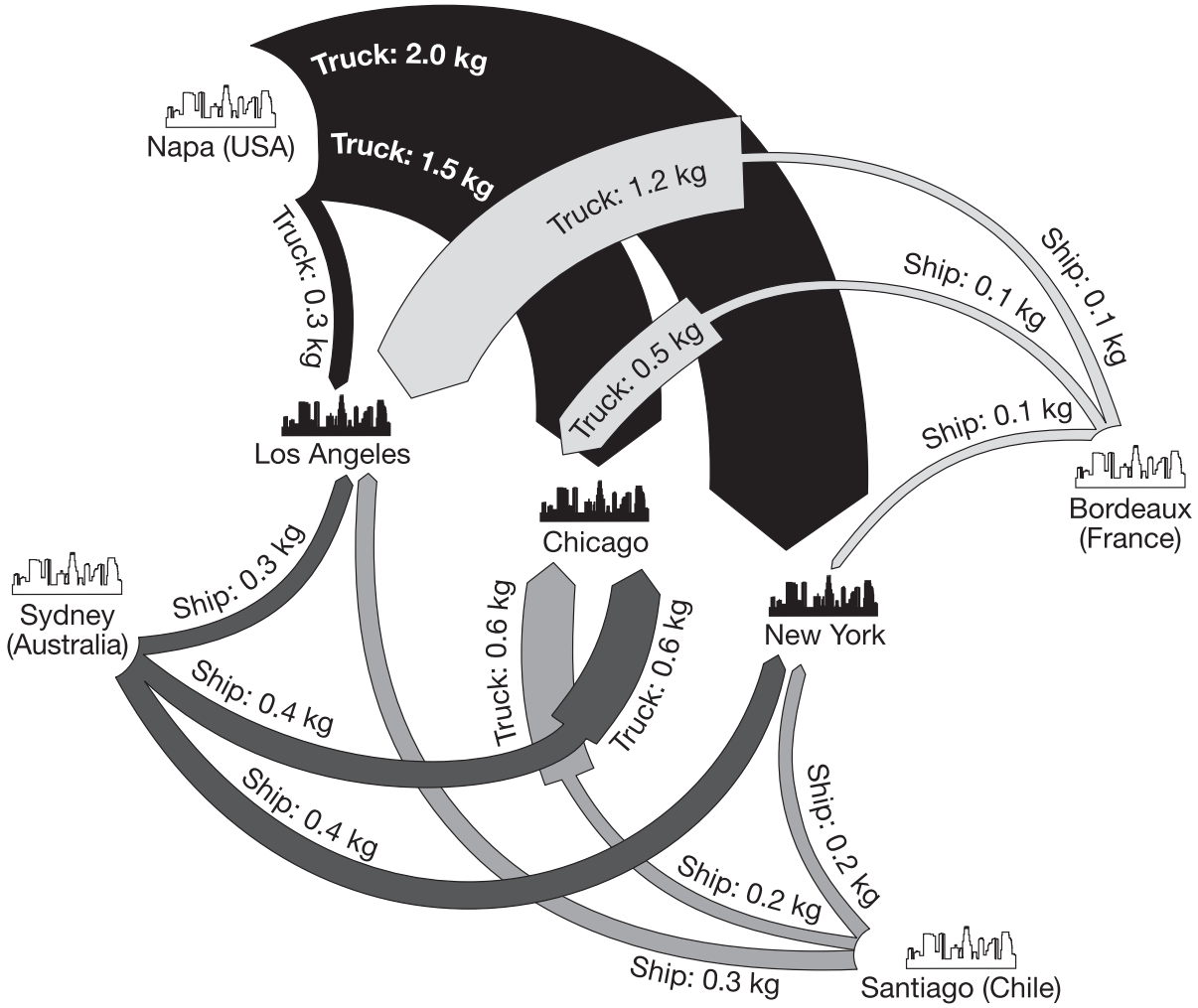
Suppose **P** has a capacity of 512 gigabytes and costs $80.

If she plotted her previous model on the graph, which other model would be closest to it?

A. **Q**
B. **R**
C. **S**
D. **U**

Questions 8–12

This diagram shows the carbon dioxide (CO_2) emitted when transporting jars of olives along different routes to three cities in the USA: Los Angeles, Chicago and New York. Two modes of transport are represented in the diagram – over land by truck and over sea by ship. The CO_2 amounts stated in the diagram are in kilograms per jar.



8 Which of the following statements about the diagram is true?

A. A thinner arrow line indicates travelling a shorter distance on a route.

B. A thinner arrow line indicates a lesser amount of CO_2 emissions produced along a route.

C. The thickness of an arrow line represents the number of product shipments made on a route.

D. The length of an arrow represents the amount of CO_2 emissions produced along a route.

9 In the diagram, there are two icon types that represent cities.

Icon A: 

Icon B: 

In relation to these icons, which of the following is true?

The icons indicate whether a city is

A. an export location or an import destination.

B. a high-producing or low-producing CO_2 source.

C. located in the USA or located in a different country.

D. a large or small producer of olives.

10 Carlos is setting up a new business in Chicago, supplying olives to grocers in Chicago.

According to the diagram, where should Carlos source his olives from if he wishes to minimise CO_2 emissions associated with transportation?

A. Bordeaux (France)

B. Napa (USA)

C. Santiago (Chile)

D. Sydney (Australia)

11 According to the information provided, which of the following is true?

A. Sea-based transport emits more CO_2 per jar than land-based transport.

B. The mode of transport used is irrelevant to the amount of CO_2 emitted for all routes.

C. Transport within the USA emits more CO_2 per jar than transport to the USA.

D. The number of jars being transported has no impact on the amount of CO_2 emitted.

12 Which of the following would also have an impact on CO_2 emissions during transport but is **not** included in the diagram?

A. how the product is stored at a delivery destination

B. the number of ships available to use at a shipping location

C. the number of people needed to load the product onto a ship or truck

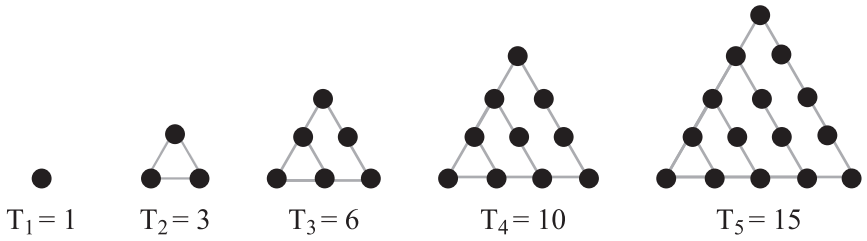
D. moving the product from an olive farm to the nearest shipping location

Questions 13–15

Triangular numbers form the sequence $1, 3, 6, 10, 15$ ...

T_n is the triangular number represented by a triangular arrangement of dots with n dots on each side.

For example, T_3 represents the third triangular number. It has 3 dots on each side and 6 dots in total. Therefore, 6 is the third triangular number (T_3).

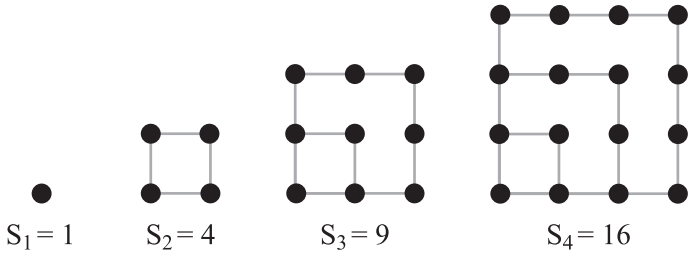


Similar sequences can be formed using squares and pentagons.

The square numbers form a sequence $1, 4, 9, 16$ ...

S_n is the nth square number.

The third square number is 9 and it is represented by S_3.

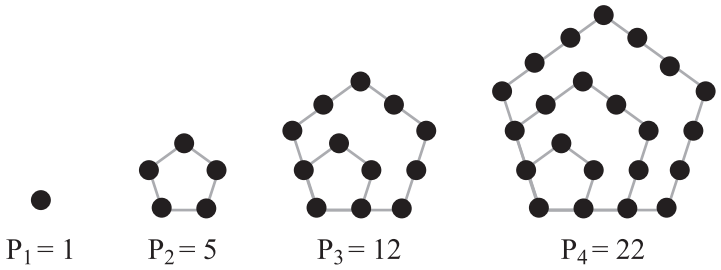


The pentagonal numbers form a sequence $1, 5, 12, 22$ …

P_n is the nth pentagonal number.

P_n is represented by a pentagonal arrangement of dots with n dots on each side.

The third pentagonal number is 12 and it is represented by P_3.



13 For values of n greater than 1, the square number, S_n, is the sum of two triangular numbers.

S_{n+1} is the term after S_n. S_{n-1} is the term before S_n.

For example, if $S_n = S_3$, $S_{n-1} = S_2$ and $S_{n+1} = S_4$.

Which rule describes S_n?

A. $S_n = 2T_{n+1}$

B. $S_n = 2T_{n-1}$

C. $S_n = T_n + T_{n-1}$

D. $S_n = T_n + T_{n+1}$

14 If P_n is known, how can the next pentagonal number, P_{n+1}, be calculated?

A. $P_{n+1} = P_n + 3n - 2$

B. $P_{n+1} = P_n + 3n + 1$

C. $P_{n+1} = P_n + 2n + 1$

D. $P_{n+1} = P_n + 2n - 3$

15 T_{n-1} is the term before T_n. T_{n-2} is the term before T_{n-1}.

For example, if $T_n = T_3$, $T_{n-1} = T_2$ and $T_{n-2} = T_1$.

For pentagonal numbers greater than P_2, P_n can be calculated by adding three triangular numbers.

How can this be calculated?

A. $P_n = 2T_{n-1} + T_{n-2}$

B. $P_n = T_n + 2T_{n-1}$

C. $P_n = 2T_n + T_{n-1}$

D. $P_n = T_n + T_{n-1} + T_{n-2}$

Questions 16 and 17

Maya develops a maths code.

In her code, a shape with a number or letter inside it means an expression involving the number or letter.

This table shows Maya's code.

x means $1-x$	x means $\frac{x-1}{x}$	x means $\frac{x}{x-1}$

In Maya's code

- 5 means $1-5=-4$
- 3 means $\frac{3-1}{3}=\frac{2}{3}$

Maya can use any number except for 0 and 1 inside her shapes.

16 What is the value of 2?

A. $\frac{1}{2}$

B. 1

C. $1\frac{1}{2}$

D. 2

17 Instead of using a letter or a number, Maya decides to use her code with the expression $y+1$.

What does $y+1$ mean?

A. y

B. $y+\frac{1}{y}$

C. $1+\frac{1}{y}$

D. $y-\frac{1}{y}$

Questions 18 and 19

At a high school, there is a student group called the All-Rounders Club. In relation to the membership of the All-Rounders Club, the following statements are true.

- Every All-Rounders Club member studies French and Spanish.
- All the Spanish students who play chess are members of the All-Rounders Club.
- Any chemistry student who plays chess or netball is a member of the All-Rounders Club.
- Every chemistry student who belongs to the All-Rounders Club is on the debating team.

18 Which of the following students is **certainly** a member of the All-Rounders Club?

A. Alex who studies Spanish and plays netball.

B. Bea who studies French and plays chess.

C. Carl who studies chemistry and plays netball.

D. Deana who studies chemistry and is on the debating team.

19 Which of the following students is **definitely not** a member of the All-Rounders Club?

A. Andrew who studies French and is not on the debating team.

B. Baz who studies Spanish and plays netball.

C. Ces who studies chemistry and does not play chess.

D. Desirae who studies chemistry and is not on the debating team.

Questions 20 and 21

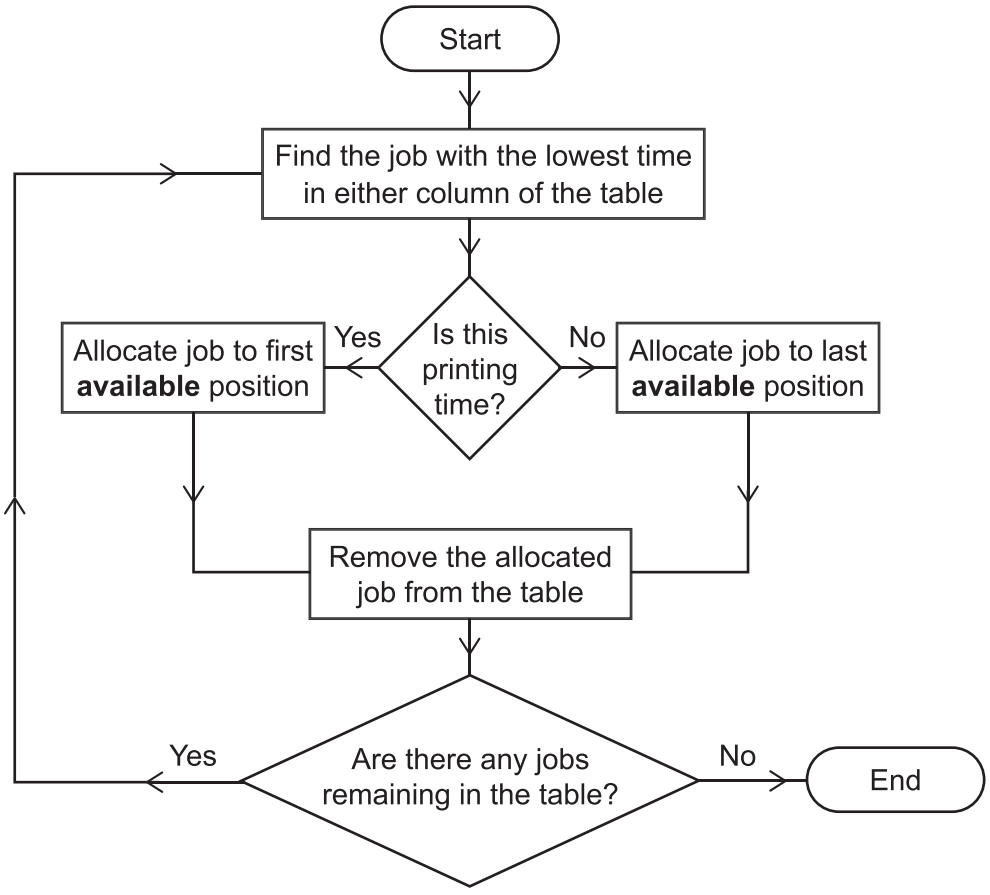
A small book publishing company receives jobs from customers to make books. To make a book the pages must first be printed and then the pages are bound together. For practical reasons, page printing for a job must be completed before book binding can begin.

The company has five jobs **J**, **K**, **L**, **M** and **N**. This table shows the printing and binding time for each job.

Expected completion time for jobs J–N

Job	Time (in hours)	
	Printing	Binding
J	4	1
K	3	7
L	2	5
M	9	6
N	10	8

The company wishes to complete all five jobs in the shortest amount of total time. To determine the order of jobs, from first to fifth, they follow the decision-making flow chart shown below.



Using the flow chart, the company will complete both the printing and binding of the five jobs in the following order: **L – K – N – M – J**.

20 The book binders can be working on a job at the same time as the printers are printing the next job in the sequence.

However, sometimes the binders run out of work and must wait for the printing of a job to be completed before binding of that job can begin.

The binders have to wait 2 hours for the printer to finish the first job, **L**.

Which is the next job that will still be printing after the binders have run out of work?

A. **J**

B. **K**

C. **M**

D. **N**

21 Suppose the company made an error in the table. The actual binding time for **J** is 5 hours and the binding time for **L** is 1 hour.

The company applies the decision-making flow chart using the correct data.

What is the corrected job order?

A. **J – K – N – M – L**

B. **J – K – N – L – M**

C. **K – J – M – N – L**

D. **K – J – N – M – L**

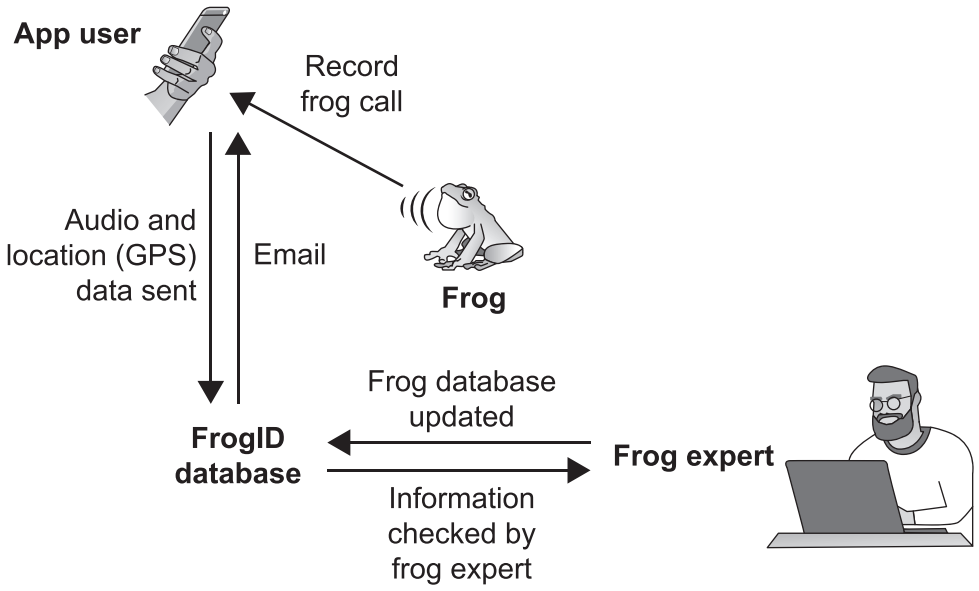
Questions 22–24

FrogID is a citizen science project. The project's goal is to find out how many frog species are in Australia, where they live, and how their distribution changes during the day and night, as well as through the seasons.

Collecting this information is important as 45 Australian frog species have been assessed as either extinct or threatened since 1970. The data from FrogID can be used to make informed decisions about land use and conservation.

Most smartphones now have sensitive microphones that can detect a wide range of sound frequencies. This has enabled development of an app to record a frog's call, note its location, date and time, and then identify the frog.

FrogID staff are encouraging citizens to download the app to their smartphones. This app is used to collect data on the presence of different frog species across Australia.



22 How is the app able to categorise frogs by species?

A. The call of each frog species is unique.

B. The habitats of frog species are known.

C. Frog calls are made at all times of the day.

D. The calls of all frog species are detectable using smartphones.

23 What question could the data in the FrogID database be used to answer?

A. How many frogs live in a particular area?

B. How loud is the call of a particular type of frog?

C. Are the numbers of frogs of different species changing in relation to each other?

D. Does the microphone on a particular brand of smartphone record frog calls accurately?

24 While using an app is an excellent means of collecting data about frogs, the data can be biased. Why could the data collected by FrogID be biased?

A. FrogID users have a range of different types of smartphones.

B. The calls of toads may be recorded mistakenly.

C. Most of the data is collected in populated areas.

D. Endangered frogs are less likely to be recorded.

Questions 25–29

The following is based on an Australian financial capability survey.

In the survey, people were asked to respond to the question: To what extent do you agree or disagree with the following statements?

Survey Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. I purchase things I know will impress others.	○	○	○	○	○
2. Nothing I do will make a difference to my finances.	○	○	○	○	○
3. Before I buy something, I consider whether I can afford it.	○	○	○	○	○
4. Dealing with money is stressful and overwhelming.	○	○	○	○	○
5. I only focus on the short term.	○	○	○	○	○
6. I try to stay informed about money matters.	○	○	○	○	○
7. Money is important to be happy in life.	○	○	○	○	○
8. Money is just a means to buy things.	○	○	○	○	○

25 The set of survey statements is **best** described as identifying

A. actions and effort.

B. skills and aptitude.

C. feelings and attitudes.

D. knowledge and experience.

26 Which one of the following pairs expresses the **most** contrasting statements?

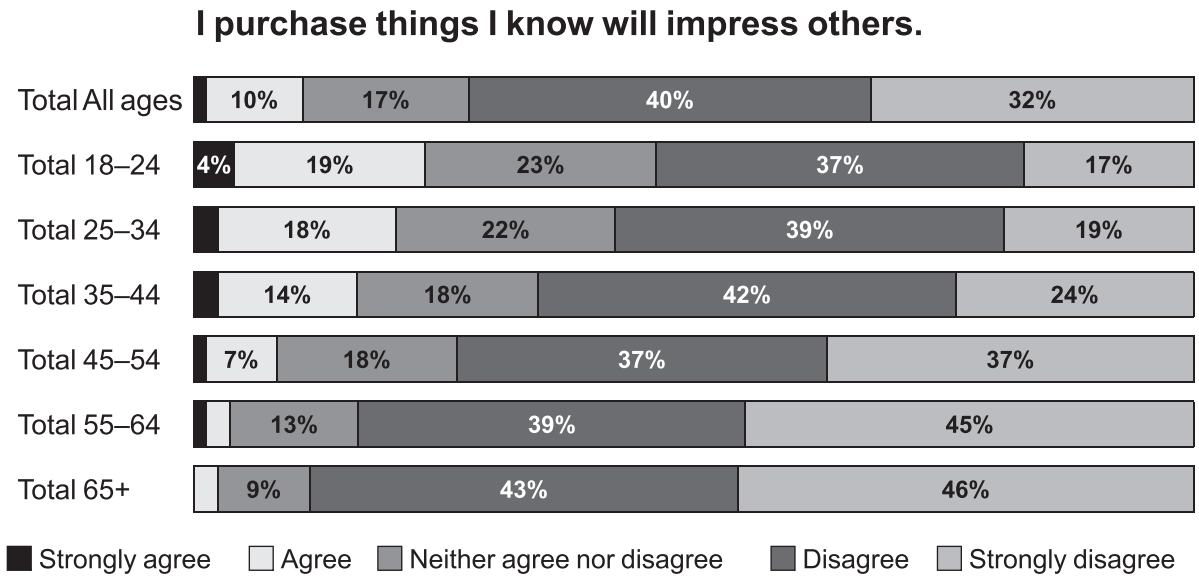
A. 6 and 8

B. 2 and 7

C. 3 and 4

D. 1 and 5

Here are the survey results for Statement 1:



27 Which one of the following generalisations about 23-year-old respondents is **most** consistent with the survey results for Statement 1?

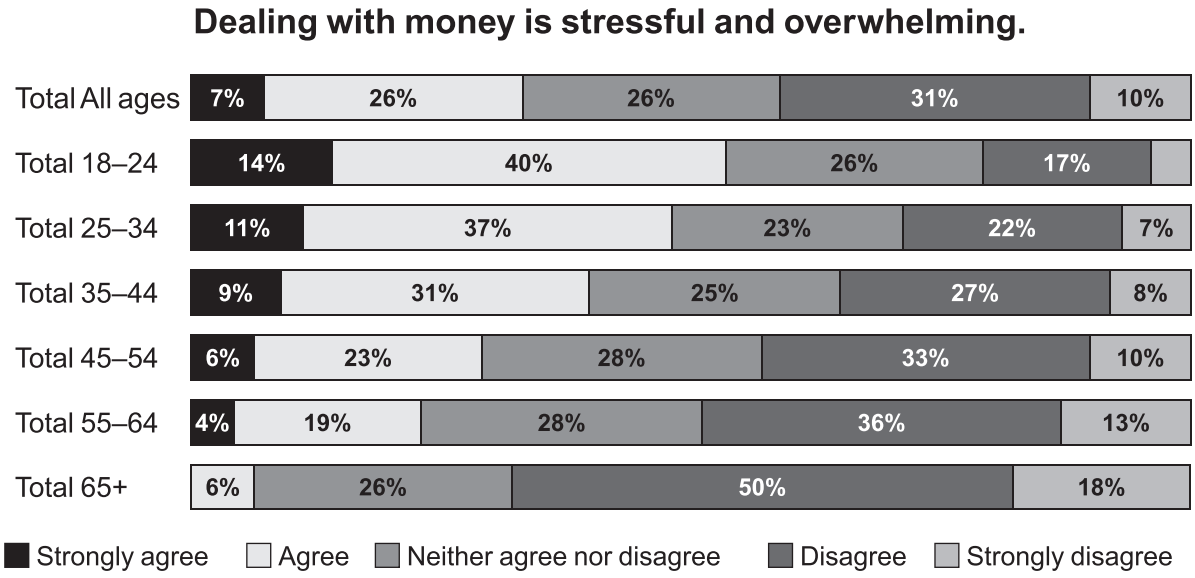
A. They will always purchase things to impress others.

B. They are unlikely to purchase things to impress others.

C. They will never purchase things to impress others.

D. They neither care nor don’t care about impressing others.

Here are the survey results for Statement 4:



28 Which of the following is true of the results for Statement 4?

A. More people aged 55–64 are likely to agree with the statement in comparison to people aged 18–24.

B. The majority of respondents in all age groups neither agree nor disagree with the statement.

C. Just over half the people aged 18–24 are in agreement with the statement.

D. People aged 25–34 are more likely to disagree with the statement than people aged 55–64.

29 Respondents in the survey were also requested to indicate their gender and household income from a list of options.

This was **most** likely because this information

A. eliminates bias towards one specific group in the survey.

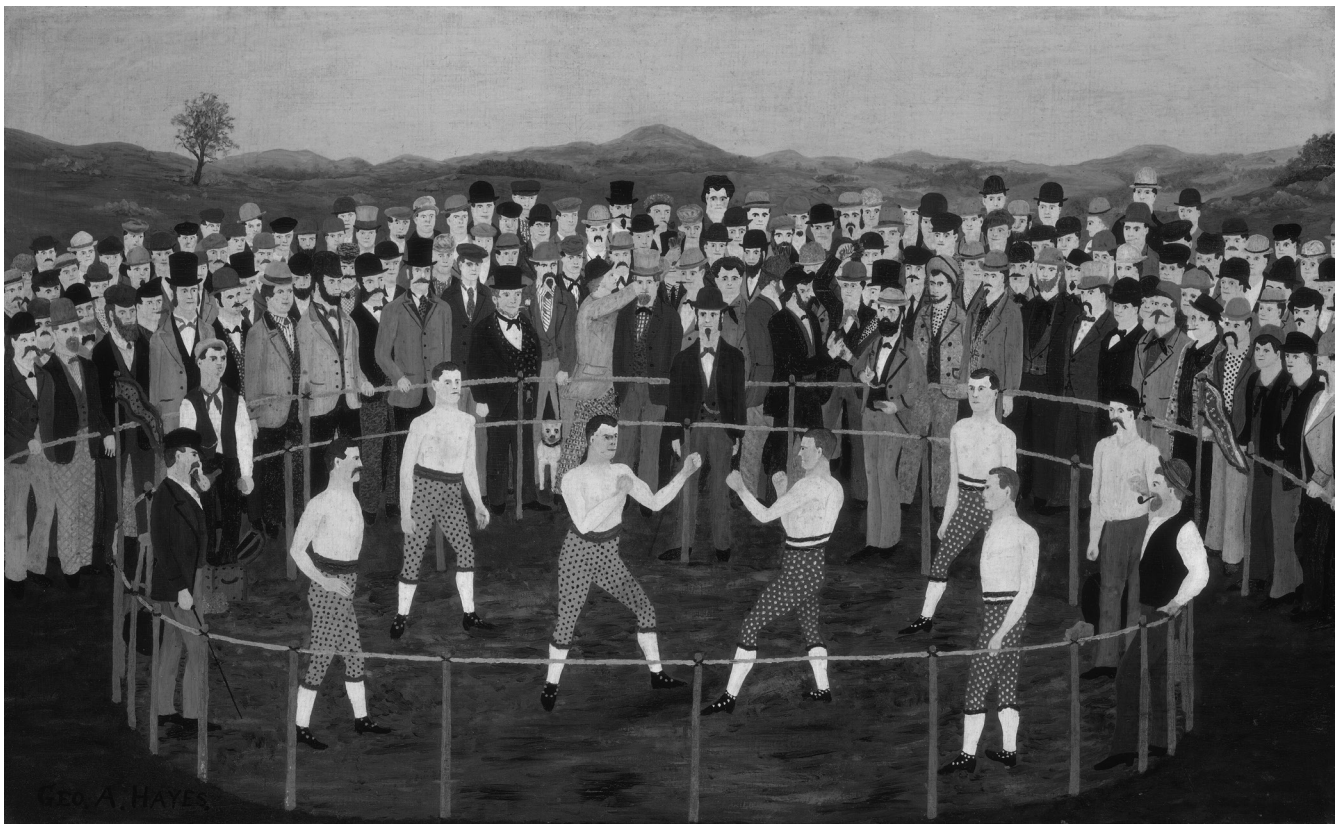
B. reveals the financial literacy of the respondents.

C. shows which gender spends more household income.

D. provides more comprehensive survey results.

Question 30

The following painting, Bare Knuckles*, by American artist George Hayes, depicts a bare-knuckle boxing match.*



George Hayes, *Bare Knuckles* (c. 1870–1885)

30 In *Bare Knuckles*, the scene is **best** represented as

A. intense.

B. orderly.

C. energetic.

D. menacing.

Questions 31–33

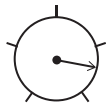
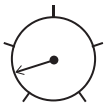
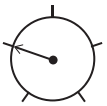
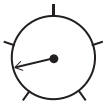
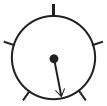
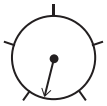
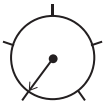
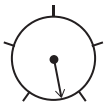
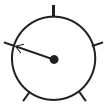
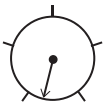
A nutritionist claims that a serve of cereal is 45 g and that an ideal cereal contains:

- a **very high** proportion of natural ingredients
- a **low** amount of sugar; no more than 8% sugar by weight
- a **high** amount of fibre; at least 10% fibre by weight
- a **low** amount of sodium; between 75 mg and 150 mg per 45 g serve.

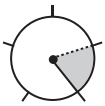
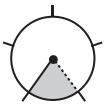
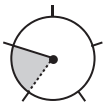
Consider three different types of cereal: **E**, **F** and **G**.

This table shows the composition of each type of cereal. For example, cereal **E** contains a low proportion of natural ingredients and a high amount of sugar.

Cereal nutrition data

Cereal	Natural ingredients	Sugar	Fibre	Sodium
E				
F				
G				

Key

Very low	Low	Moderate	High	Very high
				

31 The nutritionist states that a cereal with

- ‘low sugar’ is no more than 8% sugar, by weight
- ‘high sugar’ is at least 12% but no more than 16% sugar, by weight.

Approximately how much sugar would one 45 g serve of cereal **E** contain?

A. 5 g
B. 6 g
C. 7 g
D. 14 g

32 A cereal mixture consisting of two parts cereal **G** to one part cereal **E** is created.

Which of the following components of this cereal is present in an ideal amount?

A. natural ingredients and fibre
B. natural ingredients only
C. fibre only
D. neither natural ingredients nor fibre

33 150 mL of milk is added to a 45 g serving of cereal **F**.

In 100 mL of milk, there is 40 mg of sodium.

How much sodium is in a cereal–milk mixture made with one serve of cereal **F** and 150 mL of milk?

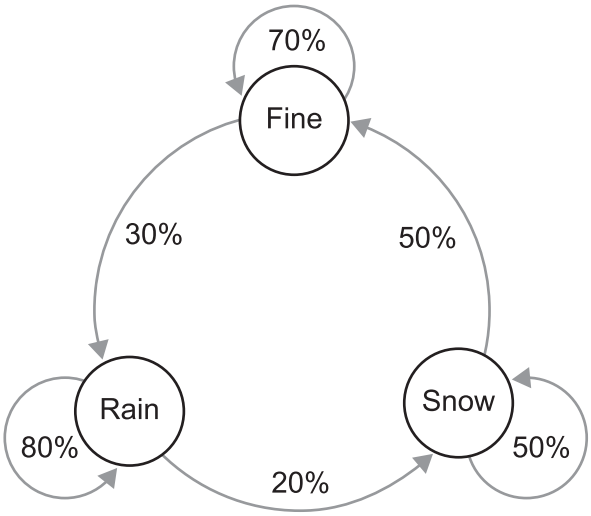
A. 190 mg
B. 210 mg
C. 255 mg
D. 285 mg

Questions 34–36

In a computer game, days are classified according to their weather as either ‘Fine’, ‘Rain’ or ‘Snow’. In the computer game, periods of rain are always followed by periods of snow, then periods of fine weather, then rain again, and so on. A period can be one or more days. This weather sequence is shown in the diagram.

The diagram also shows the chances of the weather changing and the weather staying the same for each type of day.

For example, if it rains one day, there is a 20% chance that it snows and an 80% chance that it rains the next day.



34 Which of these three-day weather sequences is **most** likely?

A. Rain, Rain, Rain

B. Rain, Rain, Snow

C. Rain, Snow, Snow

D. Rain, Snow, Fine

35 If the weather today is fine, what is the chance that the next two days will have rain and then snow?

A. 6%
B. 20%
C. 25%
D. 50%

36 If it snows on Monday, which is the best approximation of the chance that it will also be snowing on the Thursday of the same week?

A. 10%
B. 11%
C. 16%
D. 20%

Questions 37–41

The following passage has been adapted from a memoir by Olivia Laing about her experience of living in the city.

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37 A key idea explored in the passage is the

A. notion that loneliness should be embraced in cities.

B. way loneliness appears to be contagious in cities.

C. consistently destructive presence of loneliness in cities.

D. strange and unexpected presence of loneliness in cities.

38 In the first paragraph of the passage, the writer conveys an overall sense of being

A. present in the moment but also feeling a type of disconnection.
B. seemingly happy with her city existence but rueful about its lack of variety.
C. eager to understand the depth and breadth of the working life of city dwellers.
D. so overwhelmed by the city that she can only pay attention to specific parts of it.

39 The writer's claim to have been a 'citizen of loneliness' (line 15) implies that her experience of loneliness felt

A. minimal and manageable.
B. persistent and affecting.
C. insidious and alarming.
D. sudden and acute.

40 The content of lines 16 to 24 is different from the preceding content in that the writer

A. has a sudden realisation about her experience.
B. begins to blame others for how she is feeling.
C. becomes more introspective in her reflections.
D. becomes more condescending about others' loneliness.

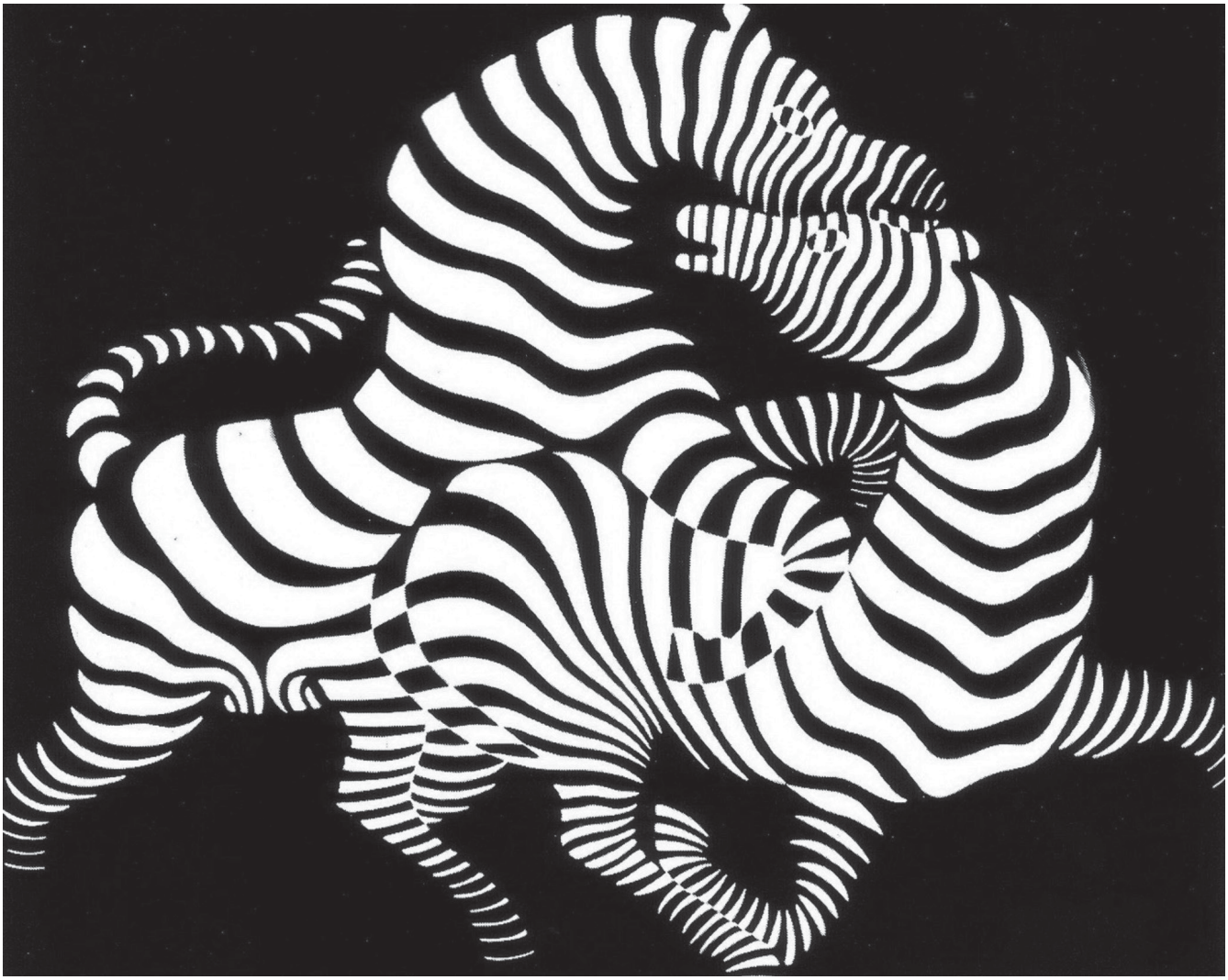
41 Overall, the writer's view of loneliness in the passage is that it

A. can only be alleviated by outside forces.
B. creates an irreversible state of hopelessness.
C. is more of a superficial feeling than a permanent state.
D. is a somewhat unavoidable state but has the potential to enlighten.

Questions 42–44

The following painting is an example of 'Optical Art', which is a style of art that uses abstract optical illusions. It is by Victor Vasarely, who is known as the 'Grandfather of Optical Art'.

One art critic noted: 'Vasarely's *Zebra* is arguably his most important piece of black and white artwork as it laid the foundation for the Optical Art movement. Vasarely did not aim to make his black and white abstract art meaningful or carry an emotional message; he sought to play with the viewer's perception.'



Victor Vasarely, *Zebra* (1937)

42 To create the image of two zebras, Vasarely mainly relies on

A. uniform lines.

B. contrast and depth.

C. gradation of shading.

D. a naturalistic composition.

43 In 1965, the Museum of Modern Art in New York conducted an exhibition called *The Responsive Eye*, which showcased works of Optical Art.

The exhibition was **most** likely called *The Responsive Eye* to emphasise the Optical Art movement's focus on

A. subverting the elitism of traditional art forms.

B. how our brain reacts to certain visual effects.

C. the public conversation around new art forms.

D. the emotions we have when we view artworks.

44 The art critic quoted in the passage makes the claim that *Zebra* is arguably Vasarely's 'most important piece of black and white artwork' because it is

A. moving.

B. controversial.

C. monochromatic.

D. innovative.

Questions 45–47

Researchers investigated the relationship between sleep quality and screen time in adults. Screen time is the amount of time spent using a device with a screen each day. Examples of devices with screens are smartphones and computers.

100 people participated in the study. 50 of the participants had more than eight hours per day of screen time, and the other 50 participants had less than two hours per day of screen time.

Researchers gave each participant a wearable monitor that measured how long it took for them to fall asleep.

Researchers asked each participant:

- their age
- to record how long it took for them to fall asleep, each day, over a four-week period.

This table summarises the results of the investigation.

Sleep study results

	Group 1	**Group 2**
Number of people	50	50
Screen time	>8 h	<2 h
Average time to fall asleep	33 min	15 min

45 Which of the following is an assumption on which the study is based?

A. Screen time before bed affects sleep.

B. Younger people have more screen time than older people.

C. All people take the same length of time to fall asleep.

D. Sleep quality depends only on how long it takes to fall asleep.

46 Scientists thought it may not be possible to form valid conclusions from the investigation because of the way it was conducted.

Which of these aspects is likely to have the **smallest** negative effect on the validity of the conclusion?

A. The study was conducted over four weeks.

B. Participants used a variety of different devices.

C. The health of the participants was not considered.

D. The type of content on the screen was not controlled.

47 A human's sleep cycle can change over their lifetime.

How could the study be improved to take account of this information?

A. Ensure the participants are the same age.

B. Increase the number of participants to 200.

C. Include 25 females and 25 males in each group.

D. Record the exact daily screen time of each participant.

Questions 48–50

On a mushroom farm, four species of mushrooms (M1, M2, M3 and M4) are grown on blocks made of woodchips. The growing process shown in Figure 1 is:

1. a small amount of mushroom tissue is added to the block
2. the block is kept at a constant incubation temperature until the mushroom tissue completely covers the block
3. mushrooms grow out of the woodchip block.

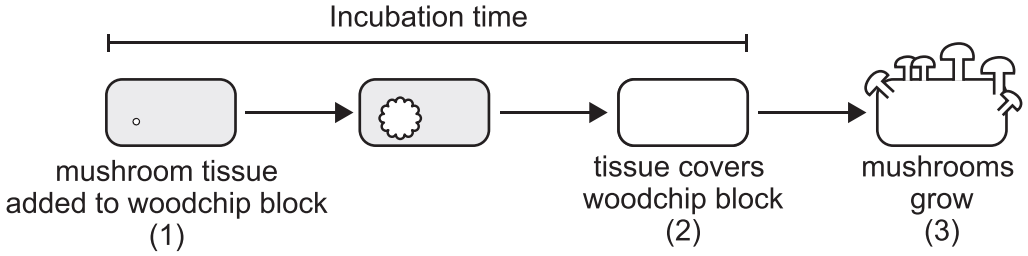


Figure 1

Figure 2 shows the incubation time at different incubation temperatures for the four species of mushrooms.

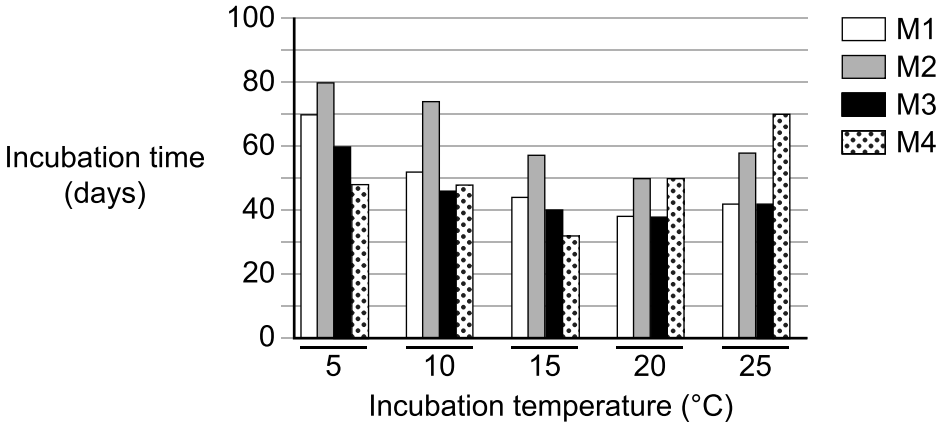


Figure 2

Biological efficiency is the total mass of mushrooms grown as a percentage of the mass of the original block. For example, when 100 g of mushrooms grow from a 200 g block, the biological efficiency is 50%.

Figure 3 shows the biological efficiency at different incubation temperatures for the four species of mushrooms.

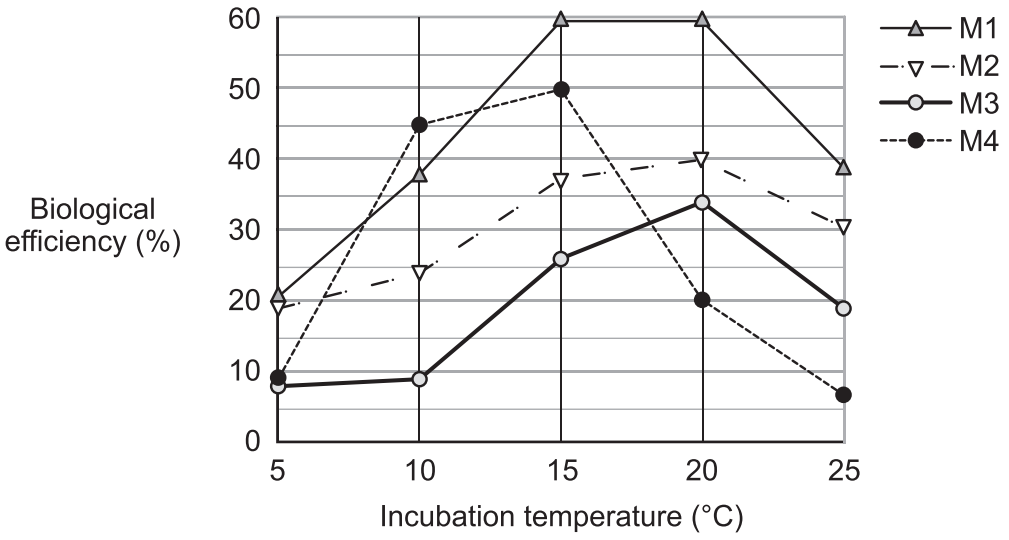


Figure 3

48 The four species are each incubated and grown on their own 1500 g block at 20 °C.

What is the difference between the heaviest and lightest mass of mushrooms grown?

A. 400 g

B. 600 g

C. 720 g

D. 900 g

49 When the incubation time required is greater than 60 days, which combination of species and temperature results in the highest biological efficiency?

A. M1 at 15 °C

B. M2 at 10 °C

C. M4 at 10 °C

D. M4 at 25 °C

50 Which mushroom's biological efficiency is **least** affected by temperature?

A. M1

B. M2

C. M3

D. M4

End of Multiple-Choice Questions

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Acknowledgements

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