

Victorian Certificate of Education 2018

General Achievement Test

Wednesday 13 June 2018

Reading time: 10.00 am to 10.15 am (15 minutes)

Writing time: 10.15 am to 1.15 pm (3 hours)

QUESTION BOOK

Structure of book

<i>Type of questions</i>	<i>Number of questions to be answered</i>	<i>Suggested times (minutes)</i>
Writing Task 1	1	30
Writing Task 2	1	30
Multiple-choice questions	70	120

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners, rulers and an English and/or bilingual dictionary.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.
- No calculator is allowed in this test.

Materials supplied

- Question book of 44 pages
- Answer book for **both** Writing Task 1 and Writing Task 2
- Answer page for multiple-choice questions on page 15 of the answer book

Instructions

- Write your **student number** on the answer book.
- Write your **name** on the multiple-choice answer page on page 15 of the answer book.
- Follow the times suggested for each task.
- All written responses must be in English.

At the end of the test

- You may keep this question book.

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

WRITING TASK 1

*To be answered in the answer book in blue or black pen.
You are advised to allocate 30 minutes to this task.*

Consider the information on these two pages.

Develop a piece of writing presenting the main information in the material. You should **not** present an argument.

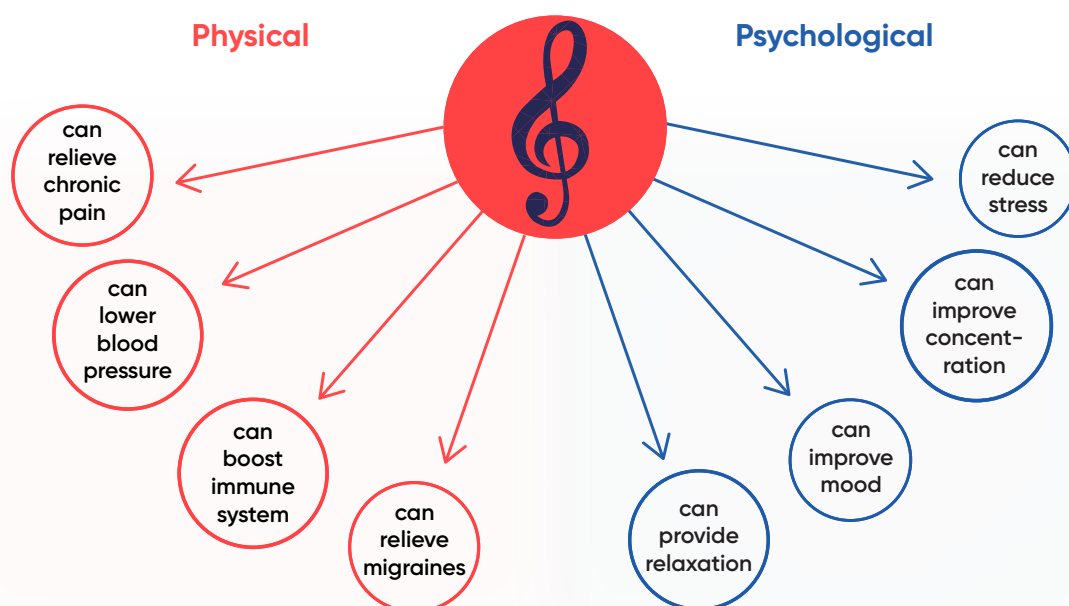
Your piece will be judged on:

- how well you organise and present your understanding of the material
- your ability to communicate the information effectively
- how clearly you express yourself.

After silence,
that which
comes nearest to
expressing the
inexpressible is
music.

Aldous Huxley

The benefits of listening to and playing music



- Estimated contribution of music sector to Australian economy in 2016: \$4–6 billion
- Every year more Australians attend live music events than attend sporting events
- 99% of Australians listen to music or attend a music event in any one year
- 32% of people aged between 15 and 24 make music
- Professional musicians are 3.6 times more likely to suffer from noise-induced deafness than those in other professions

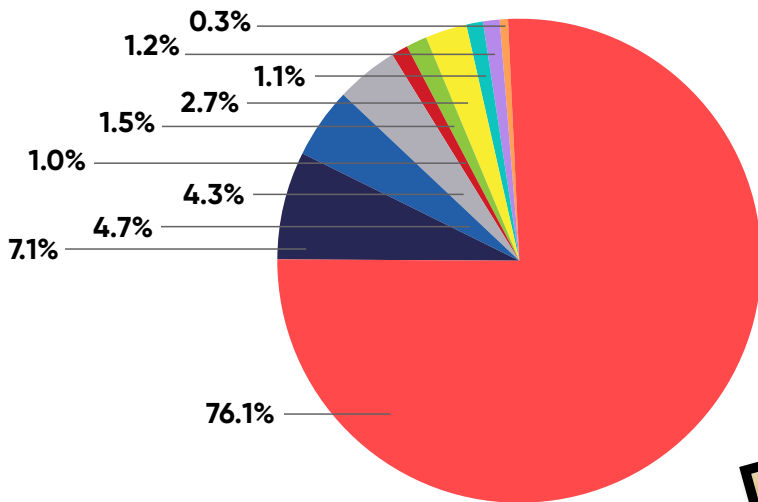


Music is a great blessing. It has the power to elevate and liberate us. It sets people free to dream. It can unite us to sing with one voice. Such is the value of music.

Nelson Mandela

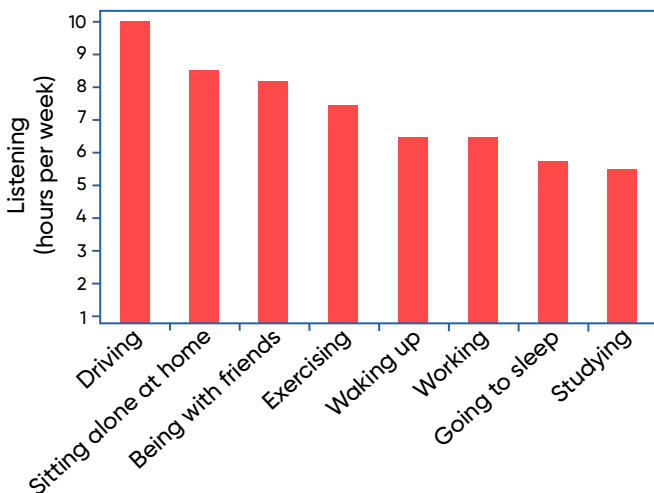


Popularity of Australian music genres based on album sales, 2015

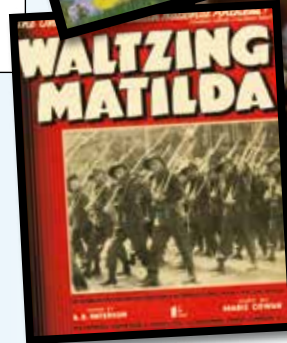
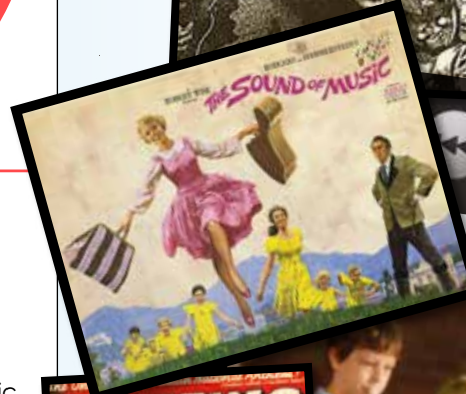
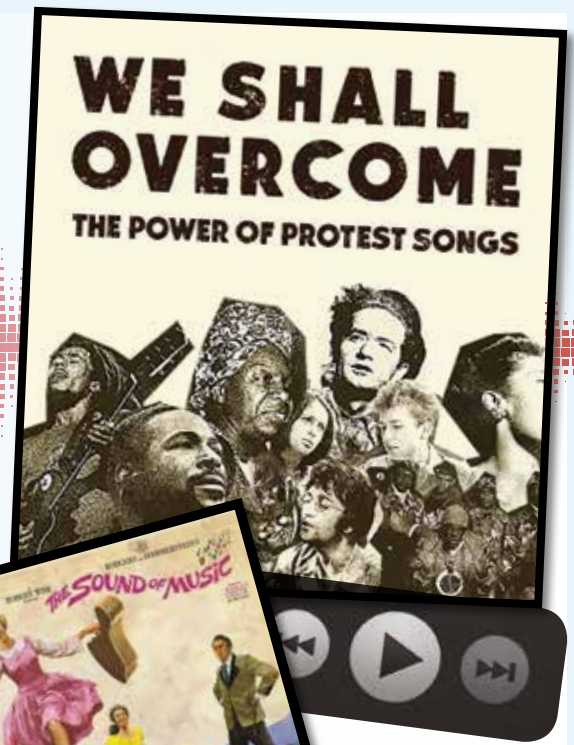


- Rock and Pop
- Country and Folk
- Classical and Operatic
- Dance
- Jazz
- Soul and Gospel
- Easy Listening
- Children's music
- Spoken Word/Comedy
- Traditional/ethnic/world music

Self-reported time spent listening to music in different situations (350 participants)

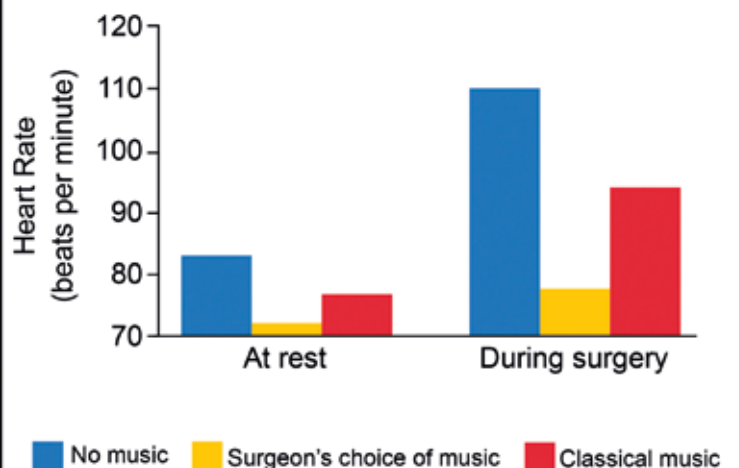


A 40 000-year-old flute made from bird bone, found in southern Germany



The heart rate of a group of surgeons was measured at rest and during surgery, with and without music.

The effect of music on the heart rate of surgeons



WRITING TASK 2

*To be answered in the answer book in blue or black pen.
You are advised to allocate 30 minutes to this task.*

Consider the statements below.

Based on **one** or **more** of the statements, develop a piece of writing presenting your point of view.

Your piece of writing will be judged on:

- the extent to which you develop your point of view in a reasonable and convincing way
- how effectively you express yourself.

The only constant element in life is change.

Progress is impossible without change, but change doesn't always result in progress.

Continuity is better than change.

Too many people accept the way things are, rather than try to make things better.

MULTIPLE-CHOICE QUESTIONS

*Answer this section in the GAT ANSWER BOOK.
Mark your answers on the Multiple-Choice Answer Page.*

You are advised to allocate 2 hours to this task.

Answer **all** questions in pencil.

Shade your answers on the multiple-choice answer page (page 15) 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.

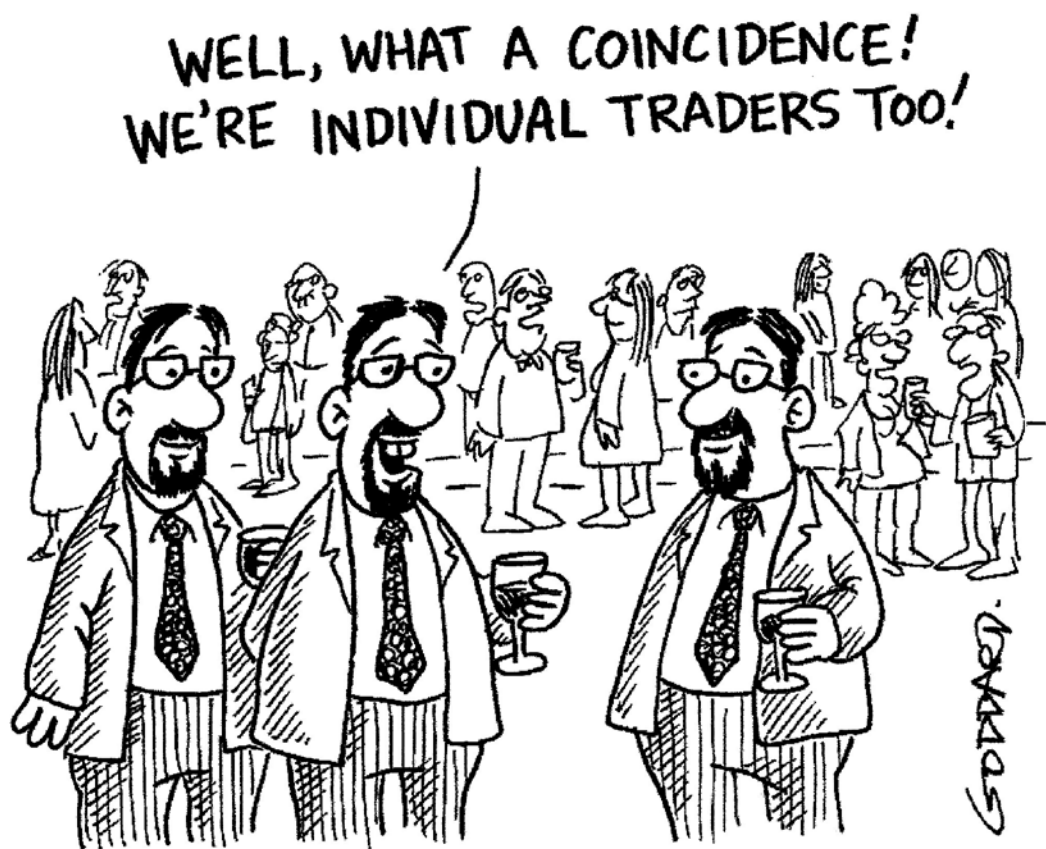
Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

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UNIT 1

Questions 1 and 2



1 The man speaking in the cartoon is best described as

- A boastful.
- B insightful.
- C imperceptive.
- D socially awkward.

2 The cartoonist associates conformity with

- A shrewdness.
- B superficiality.
- C mutual support.
- D a lack of imagination.

UNIT 2

Questions 3 – 5

Many woven fabrics are composed of two sets of threads, the *weft* threads and *warp* threads. Figure 1 shows that during weaving the weft threads are woven over and under warp threads that are usually held tight in a frame.

For any woven fabric:

- the weft and warp threads may be composed of different materials
- strength* is the maximum force, measured in newtons (N), that can be applied to the fabric before it tears
- elongation* is the maximum percentage (%) of stretch that can occur before the fabric tears.

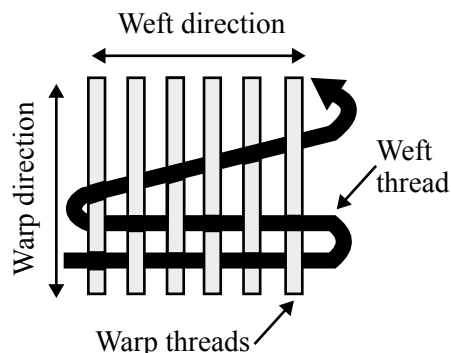


Figure 1

Figure 2 shows the strength and elongation, measured in both the warp and weft directions (as shown in Figure 1), of six different woven fabrics (I to VI).

Note that the weft and warp **strength** graphs have different scales.

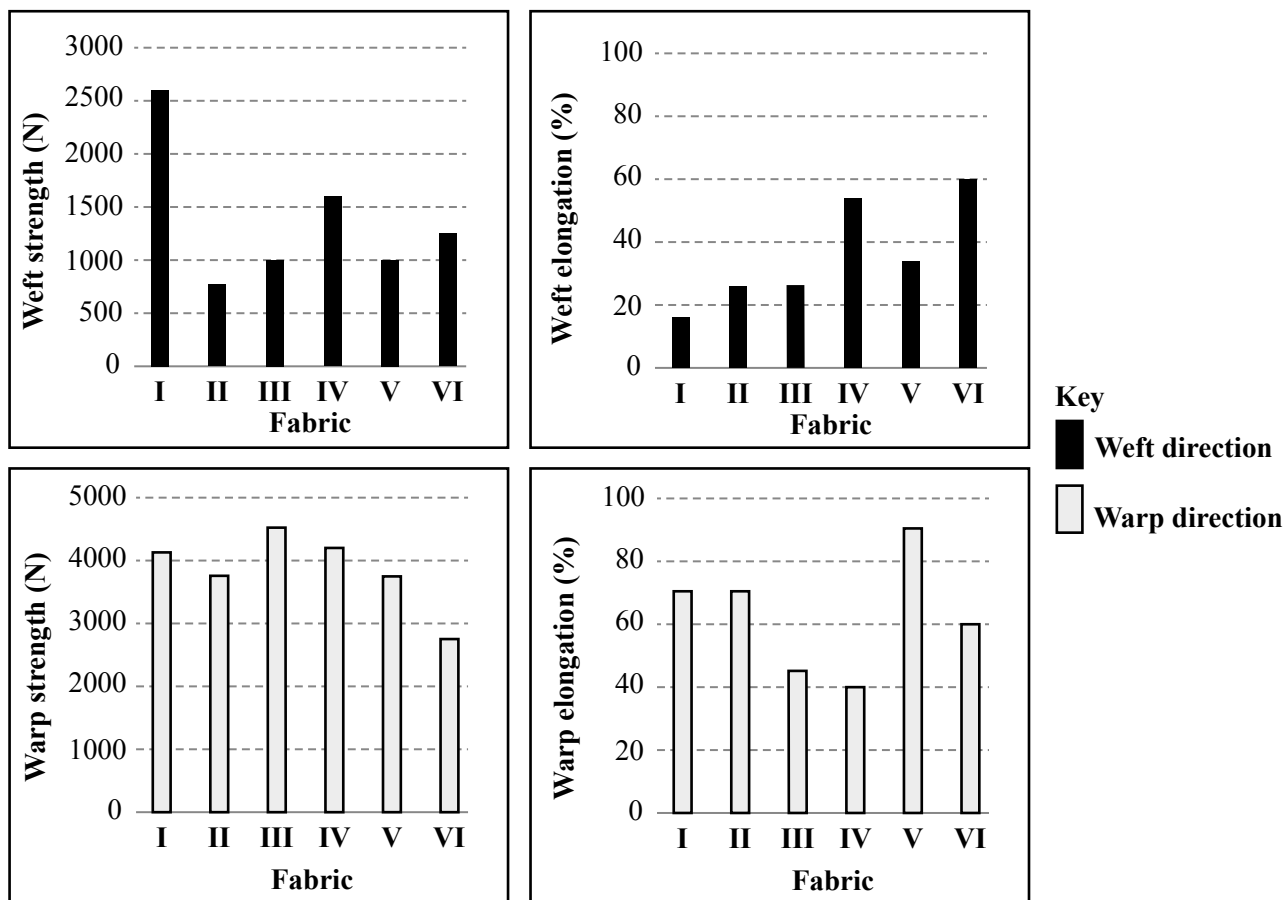


Figure 2

- 3 For each of the fabrics,
- A weft strength is less than warp strength.
 - B weft elongation is less than warp elongation.
 - C weft strength is greater than warp strength.
 - D weft elongation is greater than warp elongation.
- 4 Ruth usually uses fabric V. She now requires a fabric with greater weft and warp strength, and greater weft elongation.
- Which fabric would best meet Ruth's requirements?
- A I
 - B III
 - C IV
 - D VI
- 5 Compared with fabric II, fabric VI has greater
- A weft strength and warp elongation.
 - B warp strength and weft elongation.
 - C weft strength and weft elongation.
 - D warp strength and warp elongation.

UNIT 3

Questions 6 – 9

Days

They come to us
Empty but not clean –
Like unrinsed bottles.

Sides clouded
With a film 5
Of yesterday.

We can't keep them,
Our task is to fill up
And return.

There are no wages. 10
The reward is said to be
The work itself.

And if we question this,
Get angry, scream
At their round clock faces 15

Or try to break the glass,
We only hurt ourselves.
The days remain intact.

They wake us up
With light and leave us 20
In the dark.

For night is not
Their weakness – but a tease
To make us dream of death.

There is no end to days. 25
Only a cloth laid
Over a birdcage.

Vicki Feaver

- 6 Lines 1–9 suggest that
- A past experiences influence the present.
 - B we have no control over our lives.
 - C every day presents us with a fresh start.
 - D most people’s lives are dull and insignificant.
- 7 Which one of the sayings below best reflects the meaning suggested in lines 7–12?
- A Life is a gift.
 - B Life is a rollercoaster.
 - C Life is full of surprises.
 - D Life is a great adventure.
- 8 Which of the following best captures the point made in lines 13–18?
- A Patience is a virtue.
 - B Life is inherently unfair.
 - C Time is impervious to our desires.
 - D People’s lives tend to be ruled by their emotions.
- 9 The poem suggests that nights are not a ‘weakness’ of days (lines 22–24) because nights
- A can be soothing.
 - B are a reminder of life’s fragility.
 - C can be inspiring.
 - D provide answers to life’s questions.

UNIT 4

Questions 10 and 11

Kylie assembled a toy dinosaur puppet from a kit.

The kit contained:

- a puppet mechanism made from two tin discs to which a rubber band, a thin metal rod, a length of string and a ring were attached, as shown in Figure 1
- three cardboard cut-outs – a dinosaur head, body and tail
- two pins
- a handle with two clamps.

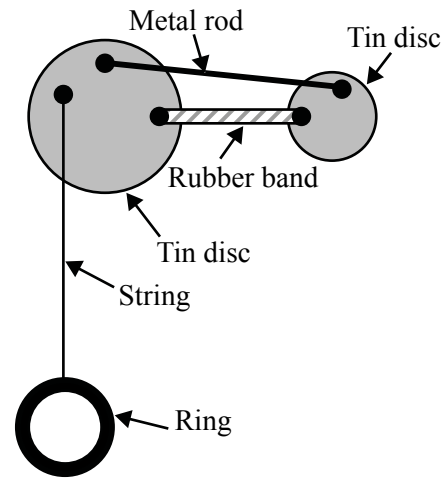


Figure 1

Kylie first glued the head to the smaller tin disc and the tail to the larger one, and then pinned these to the body. After checking that the head and tail could rotate freely around the pins, she clamped the body to the handle. Kylie operates the puppet by pulling the ring down and then releasing it.

Figure 2 shows the assembled puppet in the ‘neutral’ position before Kylie has pulled the ring down.

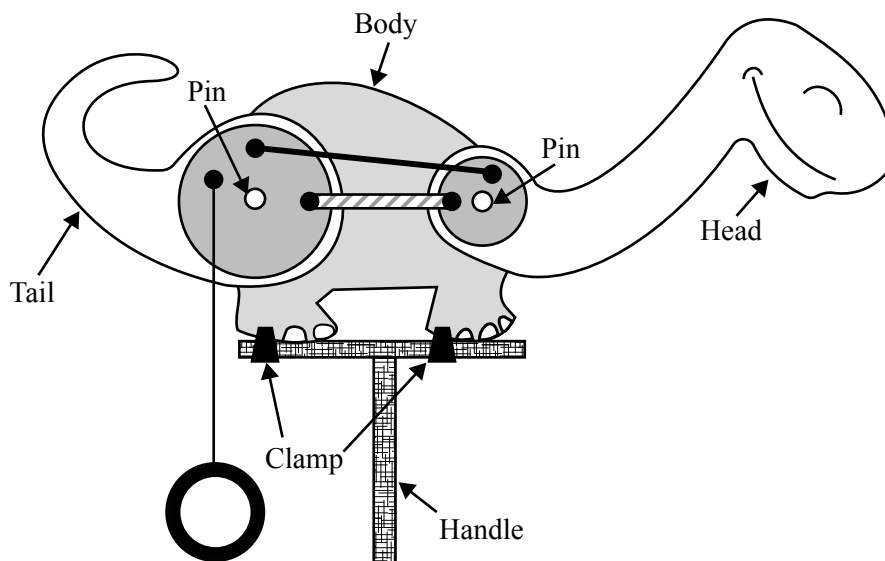


Figure 2

- 10 The main purpose of the rubber band is to
- A allow the head to move independently of the tail.
 - B ensure the head moves at the same speed as the tail.
 - C keep the head and tail in the neutral position when the ring is pulled.
 - D return the head and tail to the neutral position when the ring is released.

- 11 Suppose Kylie alters just the attachment points of the metal rod in the puppet mechanism as shown in Figure 3. All other aspects of her puppet remain the same.

What will happen when she pulls the ring?

- A both the head and the tail will rise
- B both the head and the tail will fall
- C the head will fall and the tail will rise
- D the head will rise and the tail will fall

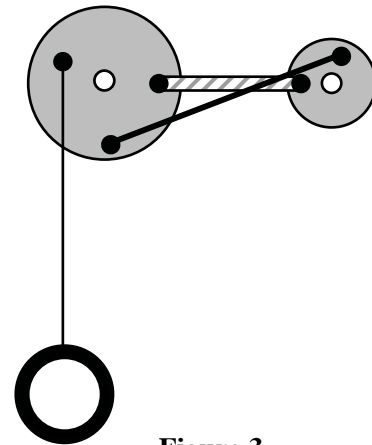


Figure 3

UNIT 5

Questions 12 – 15

When the Bacterium C level in sea water is greater than 30 organisms per 100 millilitres (org/100 mL) it is unsafe to swim.

The table below shows the Bacterium C levels measured in the sea water at 10 beaches during January 2017. Some of the data is represented by letters (**V** to **Z**).

- Measurements were taken at weekly intervals, starting on the 1st of January 2017.
- If rain was recorded at any beach, additional measurements were taken at that beach on each of the following two days. These additional measurements are shaded grey in the table.

Bacterium C levels measured at beaches (org/100 mL)

Beach	1st Jan	8th Jan	15th Jan	17th Jan	18th Jan	22nd Jan	24th Jan	25th Jan	29th Jan	30th Jan	31st Jan
Baytown	◇	◇	◇	42	34	◇	V	W	◇	57	38
Britwood	◇	25	20	154	20	36	243	◇	◇	87	◇
Fishtown	◇	◇	◇	53	◇	◇	*	*	◇	*	*
Gulltown	◇	◇	◇	227	◇	◇	X	◇	◇	365	25
Midbay	◇	◇	◇	92	◇	◇	*	*	◇	*	*
Mt Beau	◇	20	◇	*	*	◇	630	20	◇	*	*
Port Carr	◇	◇	◇	28	25	◇	189	◇	◇	300	67
Sandpoint	◇	◇	◇	*	*	◇	*	Y	Z	*	*
Seaport	◇	◇	◇	*	*	◇	271	◇	◇	*	*
Shellgrove	◇	38	70	*	*	58	*	*	◇	*	*

* = bacteria level not measured

◇ = bacteria level less than 10 org/100 mL

12 Which of the following best represents **Y** and **Z**?

	Y	Z
A	◇	◇
B	*	*
C	◇	*
D	*	◇

- 13** When, in January 2017, were the beaches at both Baytown and Port Carr most likely to have been safe for swimming?
- A** at any time
 - B** on a day after rain
 - C** two days after rain
 - D** more than two days after rain
- 14** Based on the trends in the table, which of the following is the most likely order, from lowest to highest, of **W**, **X** and **Z**?
- A** **W**, **X**, **Z**
 - B** **W**, **Z**, **X**
 - C** **Z**, **X**, **W**
 - D** **Z**, **W**, **X**
- 15** On which day or days in January 2017 did it rain at the Seaport beach?
- A** 23rd only
 - B** 24th only
 - C** 16th, 23rd and 29th
 - D** 17th, 24th and 30th

UNIT 6

Questions 16 – 19

Philosopher Stephen Toulmin asserted that an argument is composed of the following elements (in no particular order):

The Toulmin Model of Argument	
Ground	Facts or evidence offered as a foundation for the Claim; proof for the Claim
Claim	A statement being argued as true; a conclusion being reached in an argument
Rebuttal	Either a counter-argument, or a consideration of possible challenges to the argument
Qualifier	A statement or phrase that limits the strength of the argument, or the conditions for which the argument remains true
Warrant	A statement that ‘bridges’ or explains the relationship between the Claim and the Ground
Backing	A statement that supports or proves the Warrant statement

Below is an argument that uses all elements of the Toulmin model:

- i** Pet owners should be legally required to sterilise their pets.
- ii** In 2012–2013, the RSPCA euthanised close to 30 000 cats and dogs in Australia.
- iii** Many of these animals were not pets but the product of unplanned breeding.
- iv** Pet cats and dogs are known to escape their owners’ yards, particularly to follow an instinct to mate.
- v** Of course, to impose this law on registered pet breeders would deny them a legitimate source of income.
- vi** Therefore, some care would need to be taken to ensure a ‘pet breeder’ is legally distinguished from a ‘pet owner’.

16 Of the following, which sentence represents the Rebuttal?

- A** **iii**
- B** **iv**
- C** **v**
- D** **vi**

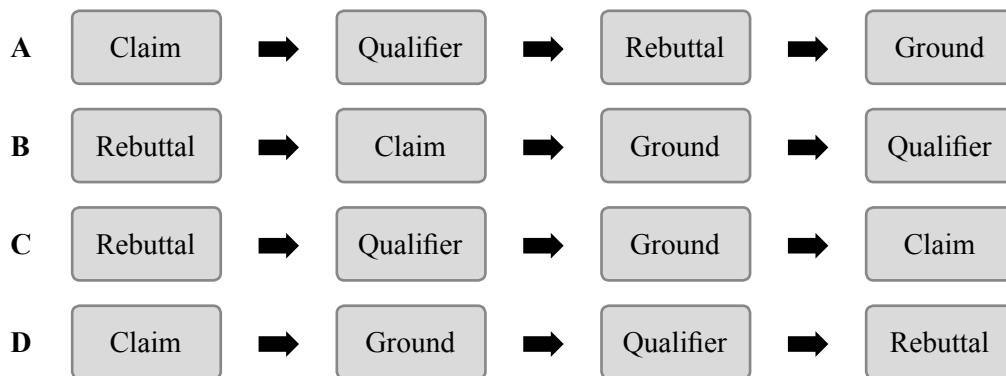
17 Which element from Toulmin’s model is **least** necessary to offer in an argument?

- A** the Claim
- B** the Ground
- C** the Warrant
- D** the Backing

Below is an argument that uses only four of the elements from Toulmin's model:

The importance of the arts in a school curriculum is sometimes questioned by experts. While it is true that the skills learned in painting or dance may not be as directly useful to one's general employability as a good foundation in maths, science and literacy, there are some useful dispositions that the arts foster in children. Doing any kind of art engages us in a process of creative 'possibility thinking' in which we seek new and interesting ways to do things. Thus, the arts perform a worthy and crucial role in the school curriculum.

- 18** Which of the following diagrams correctly represents the sequence of Toulmin's elements as presented in the above argument?



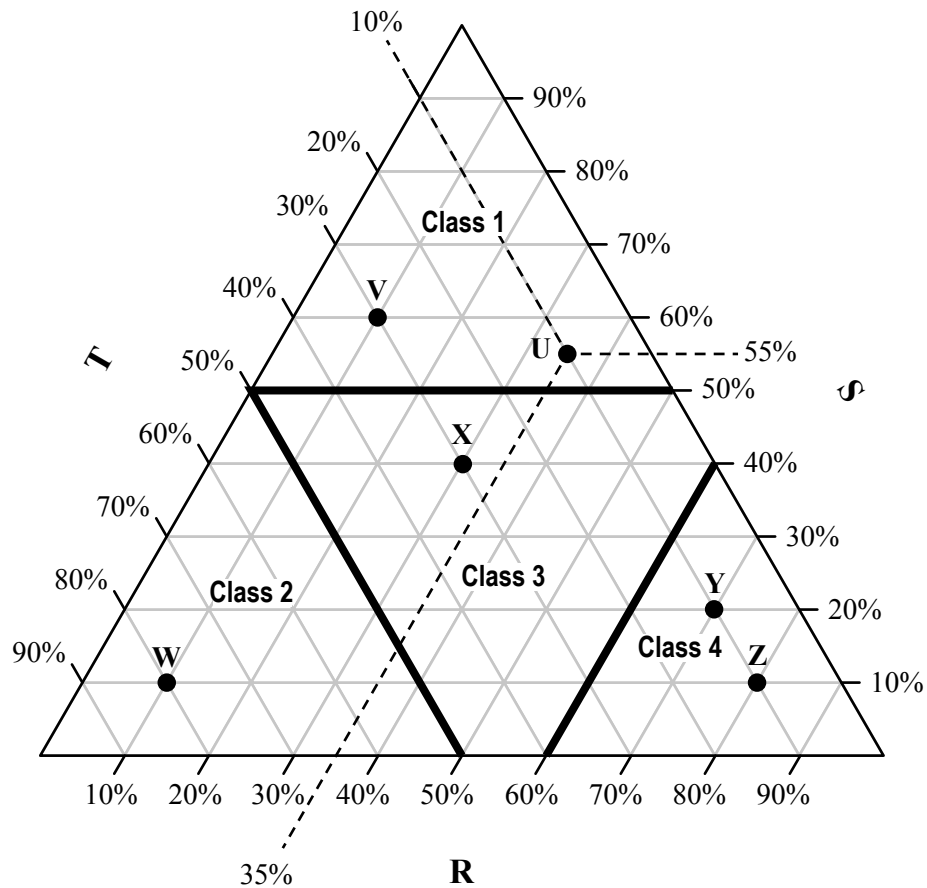
- 19** Which of the following would best function as a Warrant in the argument on arts in the school curriculum?

- A These ways of thinking are becoming increasingly valued by employees.
- B The arts provide a solid foundation in our own culture and other cultures.
- C It is fun to think in these creative ways as an artist would.
- D Studying an arts subject gives students a sense of community with each other.

UNIT 7

Questions 20 – 22

Three types of coral (**R**, **S** and **T**) grow in a particular area along the Queensland coastline. Six coral reefs (**U–Z**) in the area have been classified into four classes (1–4), as shown in the figure. For example, reef **U** consists of 35% **R**, 55% **S** and 10% **T**, and is classified as a Class 1 reef.



20 Which of the following reefs has the same proportion of **T** as reef **V**?

- A W
- B X
- C Y
- D Z

- 21 In which class would a reef that consists of 30% **R**, 10% **S** and 60% **T** be?
- A Class 1
 - B Class 2
 - C Class 3
 - D Class 4
- 22 Which of the following could **not** be correctly classified as a Class 4 reef?
- A A reef with equal quantities of **R** and **T**.
 - B A reef with equal quantities of **S** and **T**.
 - C A reef with **R** and **S**, but no **T**.
 - D A reef with **R** and **T**, but no **S**.

UNIT 8

Question 23

The man who waits for a roast duck to fly into his mouth will be waiting a very long time.

Chinese proverb

- 23 The proverb is primarily a comment about
- A luck.
 - B effort.
 - C efficiency.
 - D hopefulness.

UNIT 9

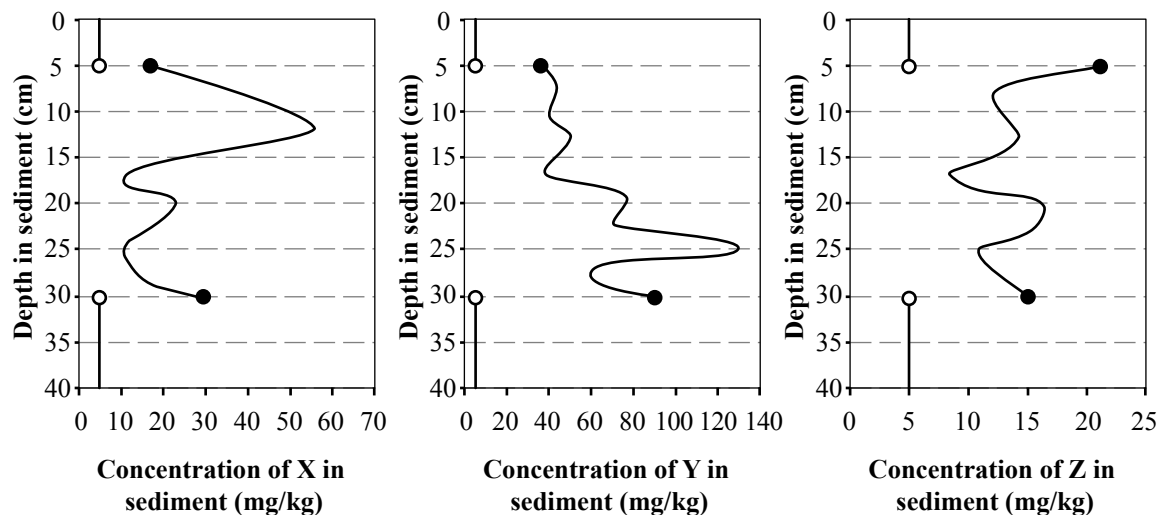
Questions 24 – 27

Mud is washed into a lake by rain. It accumulates as sediment on the bottom of the lake at a rate of 0.5 centimetres (cm) each year. The mud contains three different contaminants (**X**, **Y** and **Z**). The concentration of these contaminants changes when a nearby mine is operating.

The graphs show the concentration, in milligrams per kilogram (mg/kg), of each contaminant in the sediment, measured at the end of 2010, for depths of up to 40 cm. For example, at the end of 2010, the concentration of **X** in the sediment at a depth of 40 cm was 5 mg/kg, and the concentration of **Y** in the sediment at a depth of 30 cm was 90 mg/kg. Sediment at a depth of 30 cm in 2010 was deposited in the lake in 1950.

Note that:

- the horizontal scale on each graph is different
- a white circle (○) indicates no value at this point
- a black circle (●) indicates a value at this point.



24 At what depth in the sediment does the concentration of **X** exceed the concentration of **Y**?

- A 5–7 cm
- B 10–12 cm
- C 15–17 cm
- D 20–22 cm

- 25 Compared with sediment at a depth of 5 cm, sediment at a depth of 7 cm contains a
- A lower concentration of both **X** and **Z**.
 - B higher concentration of both **X** and **Z**.
 - C lower concentration of **X** but a higher concentration of **Z**.
 - D higher concentration of **X** but a lower concentration of **Z**.

Questions 26 and 27 refer to the following additional information.

Assume that mud washed from the mine site contained **X**, **Y** and **Z** in concentrations greater than 5 mg/kg only in the years in which the mine operated.

- 26 In which year was the mine last operating?
- A 1990
 - B 1995
 - C 2000
 - D 2005
- 27 At the end of 1990, the concentration of **Y** in the mud washed from the mine site was closest to
- A 40 mg/kg.
 - B 50 mg/kg.
 - C 80 mg/kg.
 - D 90 mg/kg.

UNIT 10

Questions 28 – 31

The following passage is from an article about research on the behavioural responses of capuchin monkeys.

A pair of brown capuchin monkeys are sitting in a cage. From time to time, their caretakers give them tokens, which they can then exchange for food. It is a well-known fact that capuchin monkeys prefer grapes to cucumbers. So what happens when unfairness strikes – when, in exchange for identical tokens, one monkey gets a cucumber and the other a grape?

5

When Sarah Brosnan and Frans de Waal carried out just this experiment, in 2003, focusing on female capuchin monkeys, they found that monkeys hate being disadvantaged. A monkey in isolation is happy to eat either a grape or a slice of cucumber. But a monkey who sees that she's received a slice of cucumber while her partner has gotten a grape reacts with anger: she might hurl her cucumber from her cage. Some primates, Brosnan and de Waal concluded, 'dislike inequity.'

10

Psychologists have a technical term for this reaction: they call it 'disadvantageous-inequity aversion.' This instinctual aversion to getting less than others has been found in chimpanzees and dogs, and it occurs, of course, in people, in whom it seems to develop from a young age. Other psychologists have found, for example, that babies as young as twelve months prefer fair-minded cartoon animals to unfair ones.

15

And yet, for humans, an aversion to getting less is just one aspect of unfairness. Unlike other animals, we sometimes balk¹ at receiving more than other people. Technically speaking, we experience 'advantageous-inequity aversion.' In some situations, we'll even give up something good because it's more than someone else is getting. In those moments, we seek to ensure that the distribution of goods remains fair.

20

¹ *balk*: recoil; react against

28 Brosnan and de Waal's research demonstrated that capuchin monkeys

- A** have empathy for others.
- B** are not naturally competitive.
- C** can be motivated by self-interest.
- D** lack the capacity to be cooperative.

- 29 'Disadvantageous-inequity aversion' (lines 12 and 13) is best described as a
- A dislike for getting less than others.
 - B desire that everything be shared equally.
 - C dislike for getting less than what is desired.
 - D desire for fairness – even if it means getting less.
- 30 Lines 13–16 suggest that the concern for equity demonstrated by capuchin monkeys is
- A shared by humans.
 - B shared by all animals.
 - C a natural instinct in some animals but learned by humans.
 - D an important distinction between human and non-human animals.
- 31 According to the passage, humans are distinct from other animals in that we
- A may at times prefer that others receive more than us.
 - B may at times prefer to receive less than we are given.
 - C are most often concerned more for ourselves than for others.
 - D are most often concerned more for others than for ourselves.

UNIT 11

Questions 32 – 34

I ... it has been said that democracy is the worst form of Government except for all those other forms that have been tried from time to time. <i>Sir Winston Churchill</i>	III Democracy substitutes election by the incompetent many for appointment by the corrupt few. <i>George Bernard Shaw</i>
II If our democracy is to flourish, it must have criticism; if our government is to function, it must have dissent. <i>Henry Steele Commager</i>	IV Democracy is a form of government in which people hold the power, either by voting on issues directly or by voting for representatives. <i>Brett Perill</i>

32 Which quotation is the most critical of democracy?

- A I
- B II
- C III
- D IV

33 Which quotation is the most neutral about democracy?

- A I
- B II
- C III
- D IV

34 Consider the following:

I believe in the politician who makes himself a nuisance. He gets snubbed and is told that he is cranky or ill-informed, but he does expose abuses which would otherwise never have been mentioned, and very often an abuse gets put right just by being mentioned.

With which of the quotations would the writer have been most in agreement?

- A I
- B II
- C III
- D IV

UNIT 12

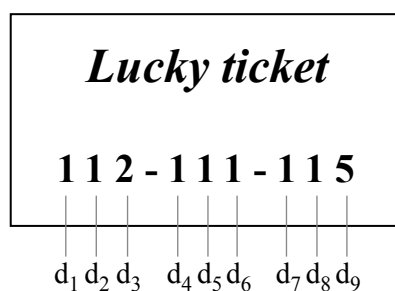
Questions 35 and 36

A supermarket gives customers who spend over \$30 a lucky ticket with the chance to win a prize. Each ticket has a nine-digit number, $d_1 d_2 d_3 d_4 d_5 d_6 d_7 d_8 d_9$.

Winning tickets satisfy the following condition:

$$3 \times (d_1 + d_2 + d_3) + 7 \times (d_4 + d_5 + d_6) + (d_7 + d_8 + d_9) \text{ is equal to a multiple of ten.}$$

For example:

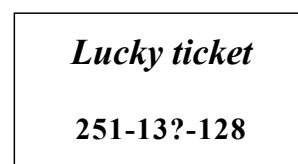


wins a prize because $3 \times (1 + 1 + 2) + 7 \times (1 + 1 + 1) + (1 + 1 + 5) = 12 + 21 + 7 = 40$.

Assume that one of each ticket from **000000001** to **999999999** is available.

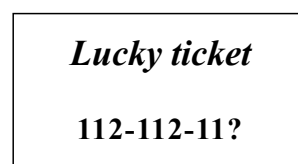
- 35** Which of the following values of d_6 will make the ticket below a winning ticket?

- A** 1
- B** 2
- C** 3
- D** 4



- 36** What is the chance of a ticket beginning with the eight digits shown below being a winning ticket?

- A** 1 in 8
- B** 1 in 9
- C** 1 in 10
- D** 1 in 11



UNIT 13

Questions 37 – 40

The following passage is from a short story. A man at a party meets the host's daughter, Eileen, in the kitchen.

'Were you asleep?' he asked. 'Did we wake you?'

'I was doing my homework,' she said.

He looked at her again, seeing her against a background of careful penmanship and themes, worn textbooks and laughter between desks.

'You're in high school?' 5

'I'm a Senior.' She seemed to wait for him to say something, and then she said, 'I was a year out of school when I had pneumonia.'

He found it difficult to think of something to say (ask her about boys? Basketball?), and so he pretended he was listening to the distant noises from the front of the house. 'It's a fine party,' he said again, vaguely. 10

'I suppose you like parties,' she said.

Dumbfounded, he sat staring into his empty coffee cup. He supposed he did like parties; her tone had been faintly surprised, as though next he were to declare for an arena with gladiators fighting wild beasts, or the solitary circular waltzing of a madman in a garden. I'm almost twice your age, my girl, he thought, but it's not so long since I did homework too. 'Play basketball?' he asked. 15

'No,' she said.

He felt with irritation that she had been in the kitchen first, that she lived in the house, that he must keep on talking to her. 'What's your homework about?' he asked.

'I'm writing a paper on the future of the world,' she said, and smiled. 'It sounds silly, doesn't it? I think it's silly.' 20

'Your party out front is talking about it. That's one reason I came out here.' He could see her thinking that that was not at all the reason he came out here, and he said quickly, 'What are you saying about the future of the world?'

'I don't really think it's got much future,' she said, 'at least the way we've got it now.' 25

'It's an interesting time to be alive,' he said, as though he were still at the party.

'Well, after all,' she said, 'it isn't as though we didn't know about it in advance.'

37 Lines 3 and 4 suggest that when the man looks at Eileen 'again' he

- A is idealising her.
- B is contextualising her.
- C reminisces about his school days.
- D makes a negative judgment about her.

- 38** Which of the following most likely explains why Eileen tells the man, ‘I was a year out of school when I had pneumonia’ (lines 6 and 7)?
- A** She is intimidated by the man’s silence.
 - B** She wants the man to know how seriously ill she was.
 - C** She wants the man to know that she is mature for her age.
 - D** She wants the man to know she is older than he might assume.
- 39** Lines 16–19 suggest that the man is irritated by Eileen’s
- A** petulance.
 - B** arrogance.
 - C** nervous immaturity.
 - D** conversational restraint.
- 40** On the subject of the world’s future (lines 20–28), the man is best described as being
- A** indifferent.
 - B** intrigued.
 - C** ignorant.
 - D** intentionally provocative.

UNIT 14

Questions 41 – 44

Kim visits a vineyard where balsamic vinegar is being made using a traditional process that requires five barrels (I to V) of different sizes (measured in litres, L) and types of wood, as shown in the figure.

Each barrel contains vinegar. Vinegar is produced from cooked crushed grapes that have aged in a barrel for at least 12 months. Balsamic vinegar is produced from vinegar that has aged in barrels for several years. Only Barrel I contains vinegar that has aged long enough to be considered balsamic vinegar.

At the end of each 12 months, $y\%$ of the vinegar in each barrel has evaporated and the following steps are followed:

Step 1 – x litres of balsamic vinegar are poured from Barrel I into the flask

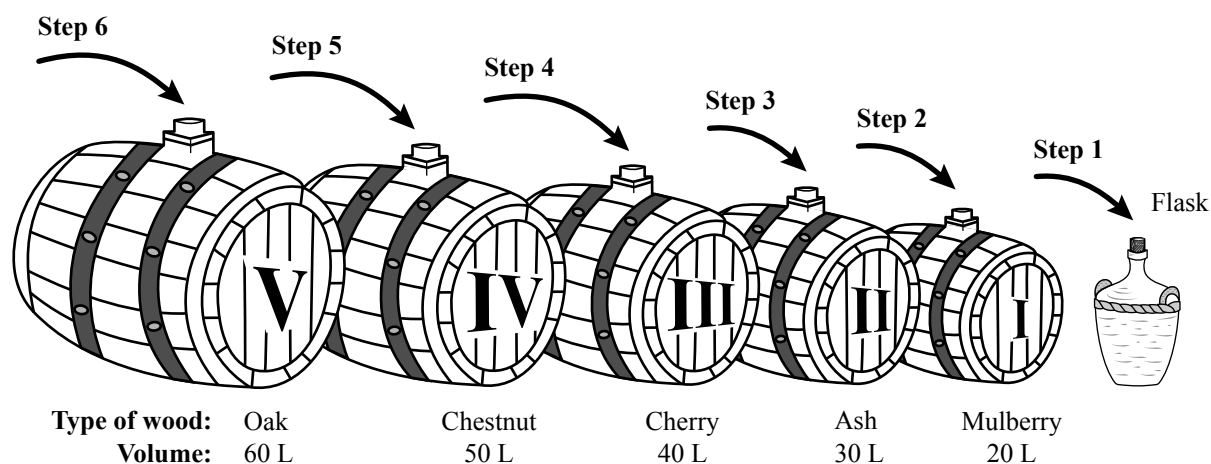
Step 2 – vinegar from Barrel II is used to top up Barrel I

Step 3 – vinegar from Barrel III is used to top up Barrel II

Step 4 – vinegar from Barrel IV is used to top up Barrel III

Step 5 – vinegar from Barrel V is used to top up Barrel IV

Step 6 – cooked crushed grapes, measured in litres (L), are used to top up Barrel V.



- 41 When $y = 10$, in total, how much vinegar has evaporated from the five barrels in 12 months?

A 10 L
 B 15 L
 C 20 L
 D 30 L

- 42 Suppose $y = 10$.

If, after 12 months, one litre of balsamic vinegar is poured from Barrel **I** into the flask, how much vinegar from Barrel **II** is needed to top up Barrel **I**?

- A 1 L
- B 2 L
- C 3 L
- D 4 L

- 43 Suppose $y = 5$.

If, after 12 months, 2 L of balsamic vinegar is poured from Barrel **I** into the flask, what volume of cooked crushed grapes is needed to top up Barrel **V**?

- A 9 L
- B 10 L
- C 11 L
- D 12 L

- 44 Suppose $y = 15$.

If, after 12 months, 34 L of cooked crushed grapes is used to top up Barrel **V**, how much vinegar was poured from Barrel **I** into the flask?

- A 3 L
- B 4 L
- C 7 L
- D 9 L

UNIT 15

Question 45

Man is least himself when he talks in his own person. Give him a mask, and he will tell you the truth.

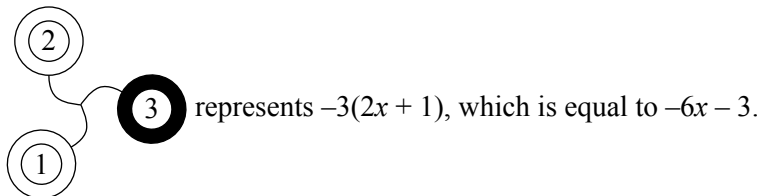
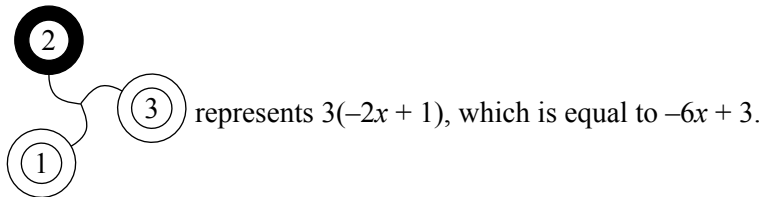
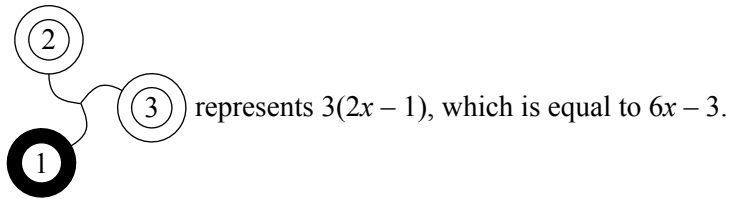
Oscar Wilde

- 45 In the quotation above, Wilde claims that by wearing a 'mask', people feel

- | | |
|-----------------------|--------------------|
| A superior to others. | C more vulnerable. |
| B more sensitive. | D more empowered. |

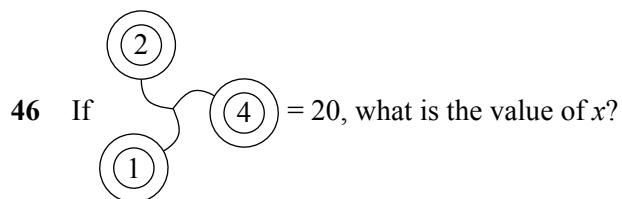
UNIT 16

Questions 46 – 48



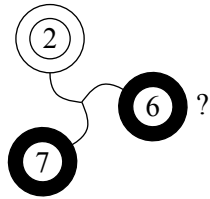
Note: the rules for multiplying integers are

positive $\times$ positive = positive
 negative $\times$ positive = negative
 positive $\times$ negative = negative
 negative $\times$ negative = positive

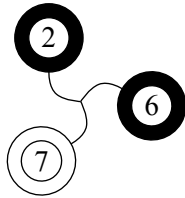


- A -2
- B -3
- C 2
- D 3

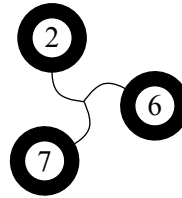
47 Which of the following is equivalent to



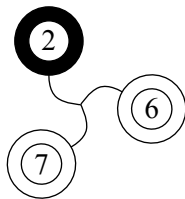
A



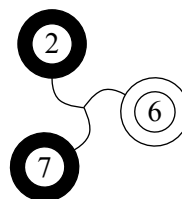
C



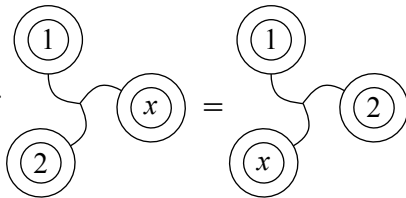
B



D



48 If



, then x could be

- A either 0 or 2
- B either -2 or 2
- C either -2 or 0
- D any of -2, 0 or 2

UNIT 17

Questions 49 – 53

The following passage is about negative results in scientific research.

The great bulk of daily scientific work never sees the light of a published day (and who would wish for changes here, as the ever-increasing glut of journals makes keeping up in one's own field impossible and exploration of others inconceivable). Truly false starts are deposited in circular files¹ – fair enough. But experiments fully carried forth and leading to negative results end up, all too often, unpublished in manila folders within steel-drawer files, known only to those who did the work and quickly forgotten even by them. We all know that thousands of novels, considered substandard by their authors, lie in drawers throughout the world. Do we also understand that experiments with negative results fill even more scientific cabinets? 5

Positive results, on the other hand, tell interesting stories, and are usually written up for publication. Consequently, the available literature may present a strongly biased impression of efficacy and achieved understanding. Such biases, produced by the underreporting of negative results, are not confined to the arcana² and abstractions of academic science. Serious, even tragic, practical consequences often ensue. For example, spectacular medical claims for the efficacy of certain treatments (particularly for chronic and fatal illnesses like cancer and AIDS) may be promoted after a positive result (often obtained on a study based on a very small sample). Later and larger trials may fail to duplicate the positive results, effectively disproving the value of the treatment. But these subsequent negative results often appear in highly technical journals read by more-restricted audiences and, as non-stories, do not come so readily to the attention of the media – and people may continue to squander hope and waste precious time following useless procedures. 10 15 20

¹ *circular files*: rubbish bins

² *arcana*: secrets or mysteries

- 49 In lines 1–3, the writer suggests that ‘the great bulk of daily scientific work’ is
- A of no value to science.
 - B overlooked by other scientists due to laziness.
 - C valuable knowledge that should be published.
 - D not essential for other scientists to know about.

- 50 ‘Such biases, produced by the underreporting of negative results, are not confined to the arcana and abstractions of academic science’ (lines 12–14).

In context, this comment is best described as expressing

- A blame.
- B frustration.
- C satisfaction.
- D ambivalence.

- 51 The writer argues that the ‘underreporting of negative results’ (line 13) can

- A devalue the hard work invested in positive results.
- B result in scientists engaging in redundant research.
- C make positive results appear less relevant than they are.
- D make positive results appear more reliable than they are.

- 52 The term ‘non-stories’ (line 20) refers to the aspect of negative results that is

- A dishonest.
- B inaccurate.
- C uninspiring.
- D inefficient.

- 53 The passage suggests that ‘negative results’ should

- A be given priority over positive results.
- B remain unpublished because of their limited relevance.
- C be published because they might contain valuable information.
- D remain unpublished because scientists already have too much to read.

UNIT 18

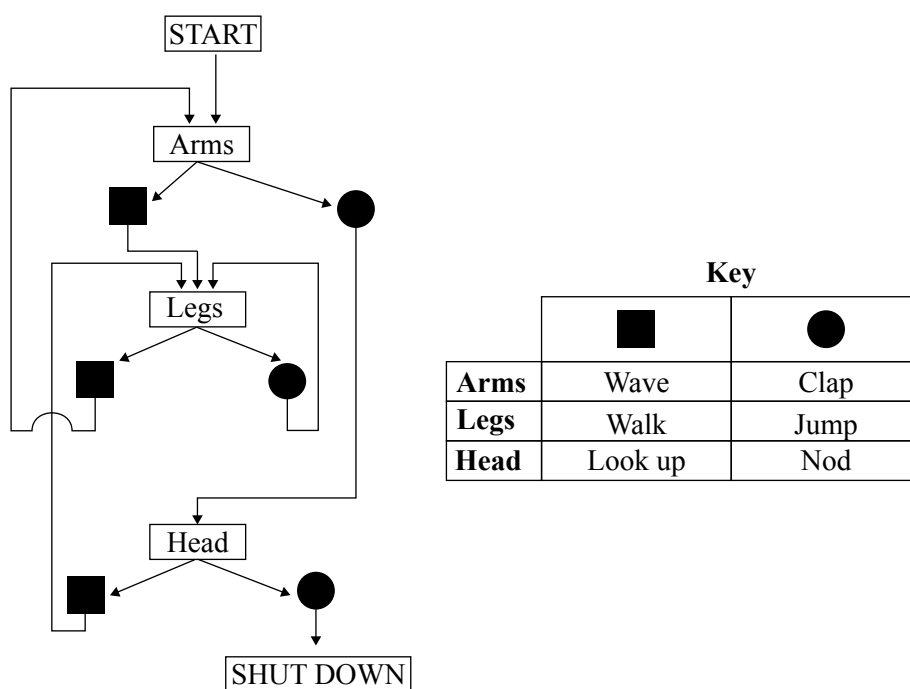
Questions 54 – 56

Rose has programmed a toy robot to perform two arm movements (wave and clap), two leg movements (walk and jump) and two head movements (look up and nod). The robot performs one movement at a time and each movement takes three seconds to complete.

The robot performs a sequence of movements by reading and interpreting a sequence of ■ and ● symbols as commands. The figure and table show how the robot interprets possible sequences of symbols.

New command sequences commence at START. The robot will automatically continue reading symbols and performing movements until it interprets a SHUT DOWN command. If a sequence of symbols ends without a SHUT DOWN command, the robot will pause and wait for further symbols to be entered.

For example, the new command sequence ■■■● will cause the robot to wave, then walk, and then clap. It will then pause and wait for further symbols to be entered.



- 54 Which of the following are always the last two movements performed by the robot just before it shuts down?
- A clap then nod
 - B look up then nod
 - C wave then either look up or nod
 - D It depends on the sequence.

55 For how long will the robot walk when performing the new command sequence    ?

- A 0 seconds
- B 3 seconds
- C 6 seconds
- D 9 seconds

56 Consider the following two command sequences:

i     

ii     

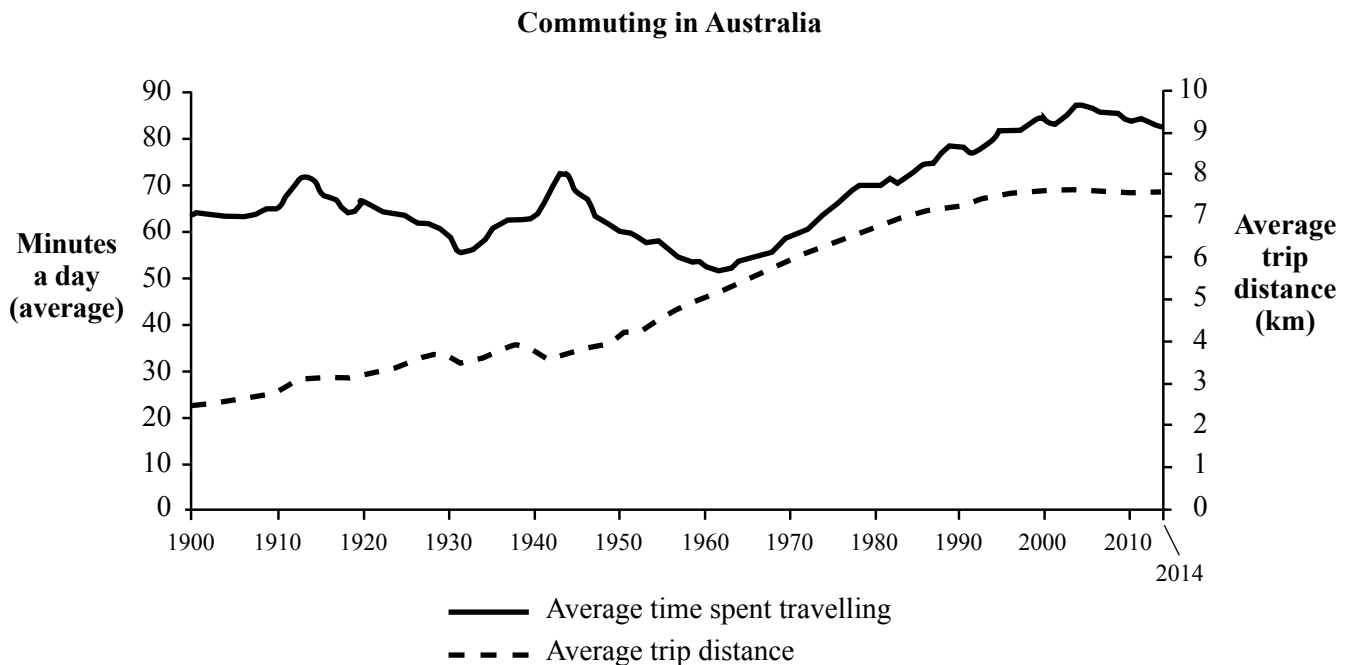
Which of these will cause the robot to look up?

- A i only
- B ii only
- C both i and ii
- D neither i nor ii

UNIT 19

Questions 57 and 58

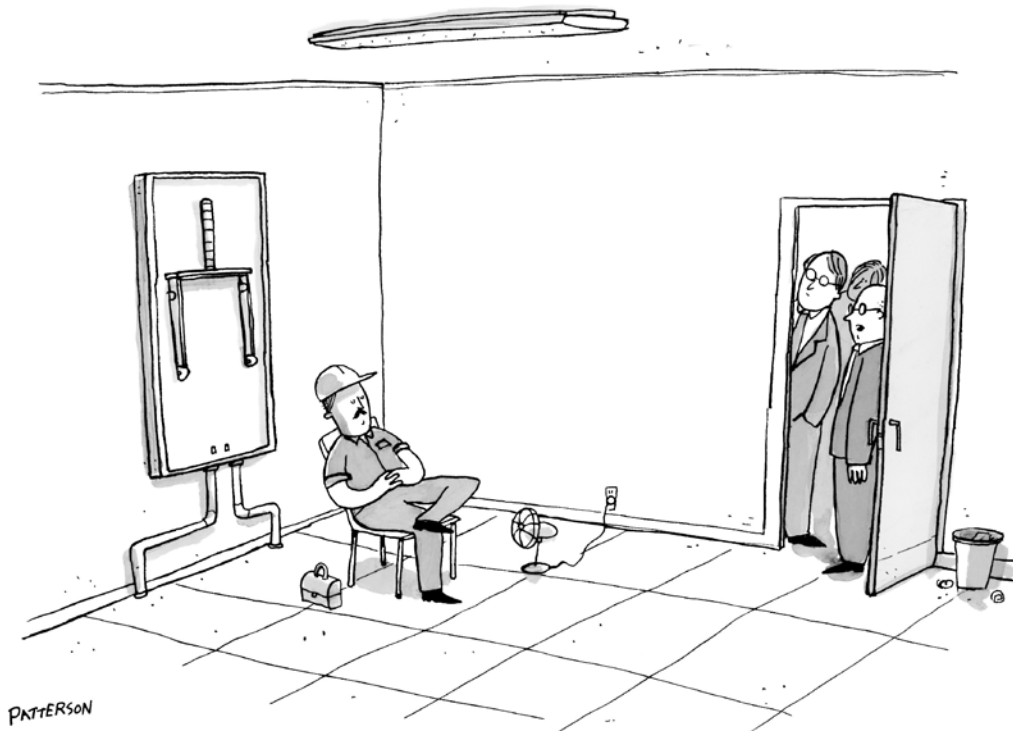
The following graph shows the average distance travelled and the average time spent travelling to and from work each day by workers in Australia between 1900 and 2014.



- 57 The graph suggests that the change in average travel times from the 1960s onwards
- A is inversely proportional to that of trip distances.
 - B continues the trend established between 1900 and 1960.
 - C is generally consistent with the change in trip distances.
 - D can be attributed entirely to the change in distance travelled.
- 58 Which of the following would most plausibly explain the relationship between travel times and trip distances between the early 1940s and 1960?
- A Car ownership increased.
 - B Immigration to Australia increased substantially.
 - C Australian cities became more densely populated.
 - D More people used public transport after World War II ended (1945).

UNIT 20

Question 59



"And that, ladies and gentlemen, is the switch that turns the government on and off."

59 The cartoon suggests that the government is

- A indecisive and unstable.
- B biased and opinionated.
- C cumbersome and unwieldy.
- D mechanical and controllable.

UNIT 21

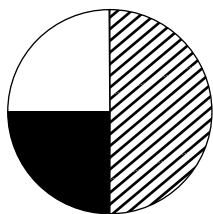
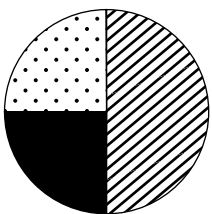
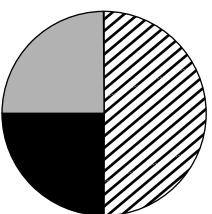
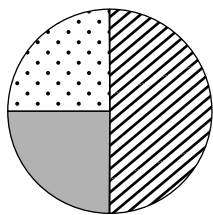
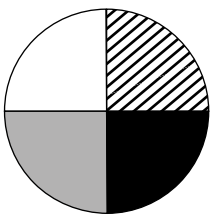
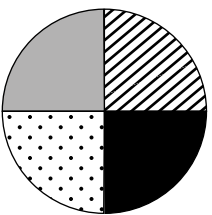
Questions 60 – 62

Five different window-cleaning mixtures (Mixtures I–V) were compared with a standard window-cleaning mixture (Standard). A layer of dirt and grease was applied to a window, which was then wiped with a cloth sprayed with a mixture. When the Standard was used, although it removed the applied layer, streaks of an unknown substance were produced.

The figure gives the composition of the mixtures and the differences observed for each mixture compared to the Standard. The results for Mixture V are missing.

Assume that:

- each ingredient has at most one effect and the ingredients did not interact
- water was an inactive constituent used to make all mixtures equal in volume
- all of the test processes and conditions were identical except for the mixture used.

Standard mixture	Mixture I	Mixture II
		
	Fewer streaks	Fewer streaks Less clean Dries more quickly
Mixture III	Mixture IV	Mixture V
		
Fewer streaks Dries more quickly Cloth glides less easily	Dries more quickly	?

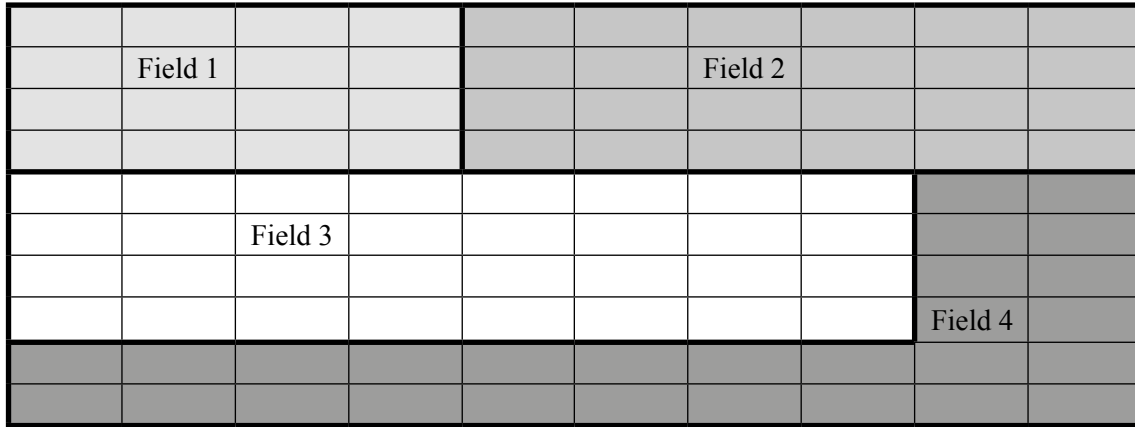
Key
  Water
  Soap A
  Methylated spirits
 Vinegar
 Soap B

- 60** When compared with the Standard, any mixture that does not change how easily a cloth glides must
- A** contain vinegar.
 - B** not contain vinegar.
 - C** contain methylated spirits.
 - D** not contain methylated spirits.
- 61** Compared with Mixture **IV**, Mixture **V** is likely to
- A** dry less quickly only.
 - B** leave fewer streaks only.
 - C** both clean better and dry less quickly.
 - D** both dry less quickly and leave fewer streaks.
- 62** Compared with the Standard, which of the following best describes the window-cleaning characteristics of Mixture **V**?
- A** dries more quickly, fewer streaks
 - B** dries more quickly, fewer streaks, cloth glides less easily
 - C** cleans better, dries more quickly, fewer streaks
 - D** cleans better, dries more quickly, fewer streaks, cloth glides more easily

UNIT 22

Questions 63 – 66

In 2015, a farmer spread two types of fertiliser, Gro-well and Best Crop, on each of the four fields represented in the figure (drawn to scale). The area of Field 1 = A_1 .



The farmer used the following two equations to calculate the cost of applying a single fertiliser to a field:

$$m = A \times R$$

where m is the mass of the fertiliser in tonnes (t), A is the area of the field in hectares (ha) and R is the recommended spreading rate in tonnes per hectare (t/ha), and

$$C = P \times m$$

where C is the cost in dollars (\$) and P is the price of the fertiliser in dollars per tonne (\$/t).

Note that the total cost of fertilising a field equals C (Gro-well) + C (Best Crop).

Assume that in 2015:

- the recommended spreading rates were Y t/ha for Gro-well and $\frac{3Y}{2}$ t/ha for Best Crop
- the farmer used the recommended spreading rate for both fertilisers on all fields
- the price for Gro-well was X \$/t and the price for Best Crop was $4X$ \$/t.

- 63 The area of Field 4 equals

A $\frac{13A_1}{8}$

C $\frac{5A_1}{4}$

B $\frac{7A_1}{4}$

D $\frac{A_1}{2}$

- 64 What would be the cost, in dollars, of fertilising Field 2 just with Gro-well?

A $\frac{A_1XY}{3}$

C $\frac{3A_1XY}{2}$

B $\frac{2A_1XY}{3}$

D $\frac{9A_1XY}{4}$

- 65 What mass, in tonnes, of Best Crop was applied to Field 3?

A A_1Y

B $2A_1Y$

C $3A_1Y$

D $6A_1Y$

- 66 Suppose that in 2016 the price of Gro-well halved and the price of Best Crop doubled.

To reduce the total cost of fertilising, the farmer used half the recommended spreading rate for Gro-well and used one-third the recommended spreading rate for Best Crop.

Compared with 2015, the total cost of fertilising Field 1 in 2016 would be

- A** less than half but greater than one-quarter.
B greater than half but less than three-quarters.
C greater than three-quarters but less than the same.
D the same.

UNIT 23**Questions 67 – 70**

The painting on the opposite page is The Fortune Teller by French painter Georges de La Tour (1593–1652). It depicts a form of street crime that was common in the 17th century.

The people in the painting are identified, from left to right, as I, II, III (young man), IV and V (old woman).

- 67 The old woman (V) is most likely
- A dishonest and complicit.
 - B vulgar and demanding.
 - C desperate and vulnerable.
 - D well-intentioned but misguided.
- 68 The young women (I, II and IV) are best described as
- A decoys.
 - B bystanders.
 - C temptresses.
 - D accomplices.
- 69 The young woman (IV) is best described as
- A wary.
 - B delighted.
 - C suspicious.
 - D frightened.
- 70 Which of the following sayings best captures the idea expressed by the painting?
- A Easy come, easy go.
 - B Beware the wolf in sheep's clothing.
 - C Vanity is the constant enemy of dignity.
 - D Keep your friends close and your enemies closer.



I

II

III

IV

V

GAT 2018 Acknowledgments

‘Well, what a coincidence’, Clive Goddard, Cartoon Stock.

‘The switch that turns the government on and off’, Jason Patterson, 21 October 2013, The New Yorker Collection, The Cartoon Bank.

‘Days’, Vicky Feaver, *Close Relatives*, Secker & Warburg, London, 1981.

‘How we learn fairness’, Maria Konnikova, *The New Yorker*, 7 January 2016.

‘Intoxicated’, Shirley Jackson, *The Lottery and other Stories*, FSG Classics, 2005.

Dinosaur in a Haystack, Stephen Jay Gould, Penguin, England, 1997.

The Fortune-Teller, Georges de La Tour (French, Vic-sur-Seille 1593–1653 Lunéville), oil on canvas, Metropolitan Museum of Art, New York.

Writing task images, Alamy stock photos; flute image courtesy of LiveScience.com.

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