



SECTION 1

INSTRUCTIONS TO CANDIDATES

Please read this page carefully, but do not open the question paper until you are told that you may do so.

This paper is Section 1 of 2. Your supervisor will collect this question paper and answer sheet before giving out Section 2.

A separate answer sheet is provided for this section. Please check you have one. You also require a soft pencil and an eraser.

Please complete the answer sheet with your:

- TSA candidate number
- Centre number
- Date of birth
- Name

Speed as well as accuracy is important in this section. **Work quickly, or you may not finish the paper.** There are no penalties for incorrect responses, only marks for correct answers, so you should attempt **all** 50 questions. Each question is worth one mark.

Answer on the sheet provided. Questions ask you to show your choice between five options. Choose the one option you consider correct and record your choice on the separate answer sheet. If you make a mistake, erase thoroughly and try again.

You **must** complete the answer sheet within the time limit.

You can use the question paper for rough working or notes, but **no extra paper** is allowed.

Calculators are NOT permitted.



UNIVERSITY OF
OXFORD

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This paper consists of 33 printed pages and 3 blank pages.

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- 1 Throughout history, gold has been revered and used for expensive jewellery and ornamentation. But in the future, it will be prized for its practical uses rather than for its aesthetic appeal. It wasn't until early in the last century that gold's electrical conductivity properties were discovered. Solid state electronic devices use very low voltages and currents, which are easily interrupted by corrosion at the contact points. Gold is such an efficient conductor that it can carry these tiny currents and remain free of corrosion, making the devices highly reliable. A small amount of gold is used in almost every modern electronic device, and it is predicted that within ten years, more gold will be used in the production of electronics than in jewellery.

Which one of the following best expresses the main conclusion of the above argument?

- A** In the future gold will be prized for its practical uses rather than for its aesthetic appeal.
- B** It wasn't until early in the last century that gold's electrical conductivity properties were discovered.
- C** Gold is such an efficient conductor that it can carry tiny electrical currents and remain free of corrosion.
- D** A small amount of gold is used in almost every modern electronic device.
- E** Within ten years, more gold will be used in the production of electronics than in jewellery.
- 2 A quiz consists of 7 rounds, each of which contains 20 questions. Each question is worth one point. At the end of the quiz, but before any of the answers or scores are revealed, each team is allowed to select one of the rounds and the score for that round is tripled. In addition, the scores for the rounds immediately before and after the chosen round are doubled. The winning team at last week's quiz had the following scores in each of the rounds.

<i>round</i>	1	2	3	4	5	6	7
<i>score</i>	14	16	6	20	10	18	4

The winning team's final score was 136.

Which round did the winning team choose to have the score tripled?

- A** round 2
- B** round 3
- C** round 4
- D** round 5
- E** round 6

- 3** Whether known as the high street, main street, or market square, central shopping districts in many towns throughout the world are in danger of disappearing. The decline in some downtown shopping areas began decades ago because of various social and economic trends, including an increase in the number of women working outside of the home and the development of large supermarkets and retail parks further out on the outskirts of towns. While change is inevitably difficult, communities should not be fearful about the loss of their traditional shopping areas. Shopping is increasingly conducted via the internet. Compared to traditional ways of shopping, the online model offers savings in terms of time and other resources while also providing greater consumer choice.

Which one of the following is an underlying assumption of the above argument?

- A** Women in many countries do less shopping than in previous decades.
- B** The decline in central shopping districts is happening more quickly in places with wealthier populations.
- C** It is difficult for governments to try to stop the decline of central shopping areas.
- D** The growth in online shopping will not threaten the profitability of large supermarkets on the outskirts of towns.
- E** Traditional shopping areas serve no important purpose that cannot be satisfied by alternative shopping methods.

- 4** I have always said that owners of expensive cars are less considerate drivers, and now a study has proved me right. The study showed that they are less likely to stop at a pedestrian crossing to allow someone to cross the road than drivers of less expensive cars – in fact, their likelihood to do so decreased by about 3% for every £800 increase in the vehicle's value. Previous studies have also shown that wealth is associated with greater self-regard and lower levels of fellow feeling. So next time an expensive sports car comes along while you are waiting at a pedestrian crossing, you can be sure that it won't stop.

Which one of the following best illustrates the flaw in the above argument?

- A** It ignores the possibility that the drivers are wealthy because they are selfish, rather than vice versa.
- B** It assumes that owners of expensive cars are unlikely ever to be pedestrians themselves.
- C** It fails to take account of the greater safety features available in more expensive cars.
- D** It assumes that just because drivers of expensive cars are less likely to stop, none of them will.
- E** It ignores the fact that pedestrians can take undue risks when trying to cross the road.

- 5** You only win an election if you gain a majority of votes. You must have gained a majority of votes because you were named the winner in the election.

Which one of the following most closely parallels the reasoning used in the above argument?

- A** You are only promoted to be head teacher if you have taught for many years. You have taught for many years, so you are sure to be promoted to be head teacher.
- B** You can only go to the concert if you buy tickets or win them in the competition. You must have bought your tickets as someone else won the competition.
- C** You only get a high-paying job if you study hard in school. You are certain to get a high-paying job because you studied hard in school.
- D** You can only apply for a loan from the bank or the credit union. You missed the bank's deadline for submitting forms, so you will have to apply to the credit union.
- E** You are only eligible for the scholarship if you can prove financial need. You have been declared eligible for the scholarship so you must have proved financial need.

- 6** Rob has two different mixtures of apple juice and orange juice.

mixture 1 40% apple juice and 60% orange juice

mixture 2 70% apple juice and 30% orange juice

Rob wants to use these two mixtures to make 6 litres of a juice mixture which is 50% apple juice and 50% orange juice.

How much of mixture 2 does Rob need to use?

- A** 1 litre
- B** 2 litres
- C** 3 litres
- D** 4 litres
- E** 5 litres

- 7 The extension numbers needed to contact eight different departments in a university depend on whether the caller is calling as a student, parent, lecturer, journalist or researcher. The appropriate numbers are shown below.

	<i>student</i>	<i>parent</i>	<i>lecturer</i>	<i>journalist</i>	<i>researcher</i>
Accounts	387	387	661	387	661
Administration	117	387	117	232	232
Enquiries	239	387	387	661	387
Complaints	558	239	117	387	117
Quality Assurance	239	239	117	558	239
Marketing	387	239	232	661	232
Public Relations	239	117	387	239	232
Human Resources	239	239	661	117	239

Fran is a lecturer and regularly needs to contact all of the departments in the university.

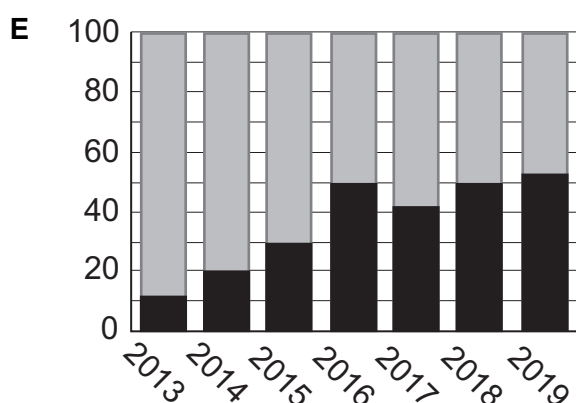
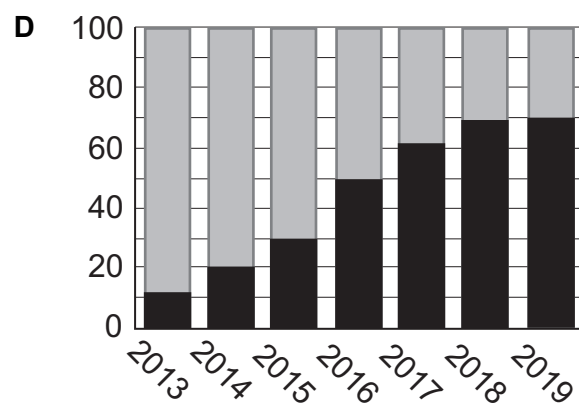
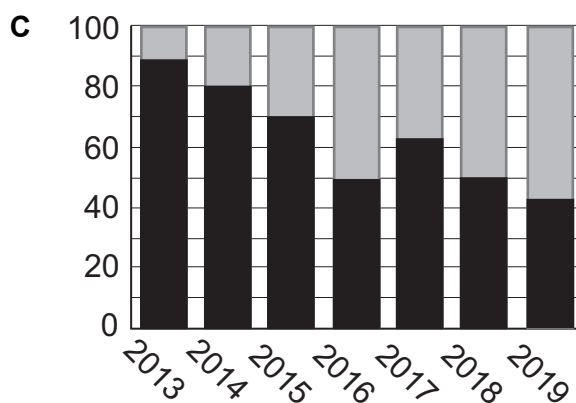
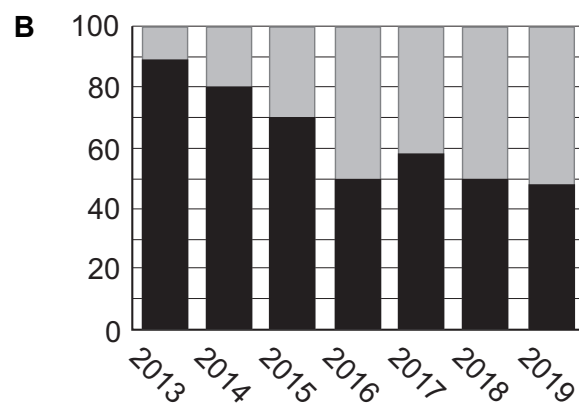
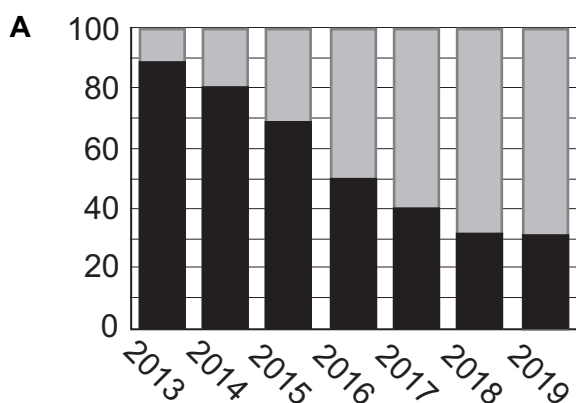
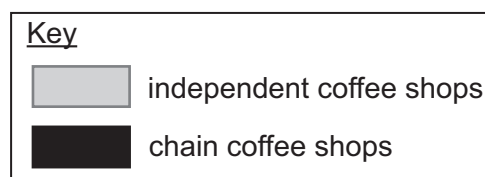
How many of the extension numbers are **never** needed by Fran?

- A 0
- B 1
- C 2
- D 3
- E 4

- 8 Over the past decade the popularity of coffee has soared in the United Kingdom. As a result, the number of coffee shops across the UK has risen. The table below shows a breakdown of the number of chain and independent coffee shops in East London between 2013 and 2019.

	number of coffee shops in East London						
	2013	2014	2015	2016	2017	2018	2019
<i>chain</i>	16	20	35	45	70	100	130
<i>independent</i>	2	5	15	45	50	100	140
<i>total</i>	18	25	50	90	120	200	270

Which graph shows the information in the table above?



- 9** Bicycle owners have a duty to have their bicycles maintained properly. This is to ensure the safety both of the rider and of other road users. If an injury is caused to another person as a result of a failure to maintain a bicycle properly, then the injured person should be entitled to compensation from the owner of the bicycle.

Which one of the following best illustrates the principle used in the above argument?

- A** Skiers injured whilst skiing off the official ski run should be entitled to compensation from the manufacturer of the skis.
- B** A passenger on a train who is injured tripping over luggage not put in the luggage rack should be entitled to compensation from the train company.
- C** A child injured while playing on a broken swing in a park should be entitled to compensation from the park owner.
- D** A householder scalded when pouring water from a kettle should be entitled to compensation from the manufacturer of the kettle.
- E** People who eat too many biscuits and damage their health should be entitled to compensation from the shops which sold the biscuits.

- 10** Despite ranking top of gender equality lists, Sweden is like practically every other country in terms of having an unequal division of labour for unpaid housework. Perpetuating stereotypes about who should be responsible for cleaning tasks, women still perform more domestic chores than their male partners. To address this enduring sexism about 'women's work', Sweden has recently implemented a tax policy through which the government pays half of the bill when households employ a cleaner. This policy has been a success: couples that hired a cleaner because of the subsidy report fewer arguments over housework, and the female partners have been able to devote a significant number of additional hours per month to their own paid employment.

Which one of the following, if true, most weakens the above argument?

- A** Swedish women do fewer hours of housework a week on average than women in many other countries.
- B** Many women enjoy doing housework.
- C** Sweden has a long-standing policy of paid paternity leave for fathers of newborn children.
- D** Most of the cleaners hired because of the subsidy are women.
- E** The Swedish educational system has a long tradition of emphasising gender-neutral teaching methods.

- 11** People are attracted to cities because of the job opportunities that they bring. At the same time, house prices tend to push people away from urban centres. The draw of healthy living and green environments similarly pulls people towards less urban environments, further from city centres. The limiting factor in suburban spread – the expansion of cities beyond their existing boundaries – is often travel time, by either public or private means. One of the appeals of driverless cars is that they are set to cut delays by up to 40 per cent because they switch lanes more efficiently, drive closer to the vehicle in front, and travel at a constant speed without repeatedly braking and accelerating, which is the main cause of congestion.

Which one of the following can be drawn as a conclusion from the above passage?

- A** We can expect some cities to expand beyond their current limits as a result of driverless cars.
- B** There will no longer be any limits to suburban spread with the introduction of driverless cars.
- C** The attractions of living in city centres will disappear once people have access to a driverless car.
- D** The introduction of driverless cars could mean that there are no longer any green spaces for people to enjoy.
- E** There will be more people living in suburban environments than city centres after the introduction of driverless cars.

- 12** The shampoo that I normally buy costs £1.96 for a 500 ml bottle and always lasts for 40 days.

Last month I decided to try a new brand that is 36p cheaper and contains 550 ml. However, because of the amount that I have had to use to wash my hair properly, it has run out after only 25 days.

Based upon my experience, by how many pence per day is my normal shampoo better value than the new brand?

- A** 1.5
- B** 2.4
- C** 4.9
- D** 6.4
- E** 9.5

- 13** Kate and Tek are choosing a cottage to rent for their family holiday. They have searched online and reduced their choice to five cottages. The facilities offered by these cottages are shown in the following table.

<i>cottage</i>	<i>number of bedrooms</i>	<i>large garden</i>	<i>wifi</i>	<i>parking</i>	<i>pets allowed</i>	<i>distance to nearest store</i>	<i>cost per week</i>
Acorns	3	no	yes	no	yes	2 km	\$460
Beeches	3	yes	yes	no	yes	1 km	\$490
Chestnuts	4	no	yes	yes	no	2 km	\$510
Denders	4	yes	yes	yes	no	4 km	\$500
Eglers	2	no	yes	yes	no	2 km	\$450

Ideally, Kate and Tek would like a cottage with at least three bedrooms, a large garden, wifi, parking, and they would like to be within 3 km of a store. They realise that it is unlikely that all their wishes will be met, so they decide to compromise. They insist that the cottage must have at least three bedrooms, but they will be happy if at least three of their other wishes are satisfied. If more than one cottage is suitable, then they will choose the one that is the cheapest to rent.

Which cottage will Kate and Tek choose?

- A** Acorns
- B** Beeches
- C** Chestnuts
- D** Denders
- E** Eglers

- 14** Alex and Anita play a game where they need to form words from letters. The value of each letter is a whole number of points (which can be 0). Alex and Anita earn points by adding together the value of the letters in the words they form.

The value of the last three words they formed is shown in the table below.

<i>word</i>	<i>value</i>
MOAN	7
MOON	8
NOON	10

Anita has just formed the word ANNA.

What is the value of the word ANNA?

- A** 4
- B** 6
- C** 8
- D** 10
- E** 12
- 15** There is no denying the unwanted consequences of car emissions, burning of fossil fuels, chemical effluent, and other pollutants. Their negative effects include the increasing incidence of respiratory, skin, and heart conditions. But 'environments' consist of more than just the elements of air, earth, and water. Whilst it is quite right to headline the damage we are doing to our lungs and other bodily organs, it must not be thought that this is the only way in which we are polluting our world. The effects of artificial light and constant noise are also detrimental to mental and physical wellbeing. Many people, to their cost, rarely see the stars in the night sky, or experience the quiet of the natural environment in which our species evolved.
- Which one of the following best expresses the main conclusion of the above argument?
- A** The word 'environment' does not apply only to the elements of air, earth, and water.
- B** It is right to give prominent coverage to the damage human activity is doing to our bodies.
- C** It is wrong to think that pollution of the air, earth and water is the only form of environmental damage.
- D** The effects of artificial light and noise are physically and mentally harmful.
- E** Many people are deprived of the sight of the stars or the experience of natural silence.

- 16** The past couple of decades have been fairly tricky for many countries due to economic challenges and political and social uncertainties. The UK has certainly been amongst such countries. But life there is getting better, according to the World Happiness Report, and indeed the latest findings of this annual review are something for the UK to celebrate. The project measures the quality of life in over 150 countries by scoring such factors as life expectancy, social support infrastructure, personal freedoms, and absence of corruption. In the latest Report, the UK had risen in the rankings from 15th to 13th place. While still a number of places beneath Finland, once again rated the happiest country, the UK has definitely become happier.

Which one of the following is an underlying assumption of the above argument?

- A** The UK has made changes in direct response to the findings of the World Happiness Report in previous years.
- B** It is rare for a country to move up two places in the rankings in a period of one year.
- C** The World Happiness Report is designed to show that happiness is not largely dependent on economic factors.
- D** The UK's movement in the rankings was not solely due to a fall in happiness in other countries.
- E** The levels of happiness experienced in Finland are possible to achieve in most other countries.

- 17** People complain about the fact that newspapers are often full of recycled articles about celebrity gossip, but they forget that real news costs money – investigative reporters need to go out into the world and unearth new information. The trouble is, those who complain are also unprepared to pay to read newspapers, expecting to get information for free online. But what can people expect if they want to be able to read the news for free? As they say, you get what you pay for. If you want something for free, then don't complain about the quality. This is as true of the news as of anything else.

Which one of the following best illustrates the principle used in the above argument?

- A** A person who is offered a free printer as a bonus when buying a new computer cannot complain if the computer is expensive.
- B** A person who gives as gifts items obtained for free cannot complain if friends and family criticise them for being selfish.
- C** A person who finds a winning lottery ticket cannot complain if the owner of the ticket tries to claim the winnings.
- D** A person who obtains free legal advice online cannot complain if the advice ends up being unhelpful.
- E** A person who buys an illegally copied film cannot complain if the picture is not as clear as they would like it to be.

- 18** Sean is taking his car to Sunny Island. He lives 38 miles away from the mainland terminal where the seaport and airport are based. He has researched the travel costs and come up with two possible options. The ferry ticket (car and passenger) is \$80. Alternatively, a plane ticket is \$50 and the seaport company will transport his car (port to port) for \$100. Fuel costs are \$1.50 per mile.

How much money will Sean save by taking the cheaper option?

- A** \$13
- B** \$20
- C** \$30
- D** \$70
- E** \$127
- 19** A youth club is open six evenings every week. There are nine volunteers who run the club. Each evening three of the volunteers are on duty.

When the rota is drawn up for any week, the following conditions must be met:

- Each volunteer has two evenings of duty, but never two consecutive evenings.
- No two volunteers are on duty together twice in the same week.

Next week's rota has just been published, as follows:

<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
Mel	Eve	Jan	Mel	Eve	Fay
Rod	Fay	Leo	Pat	Jan	Leo
Sam	Tim	Sam	Tim	Rod	Pat

Fay wants to swap her Tuesday duty with one of the others to be on duty on Monday or Thursday instead.

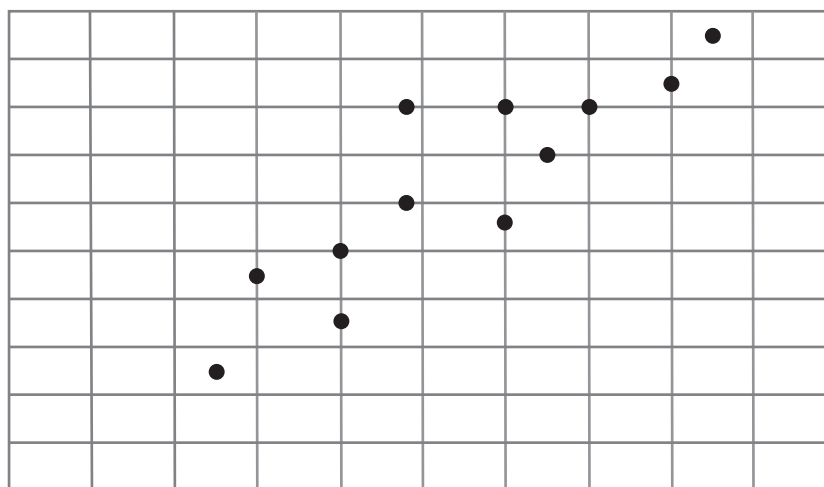
Who is the only volunteer on the rota for Monday or Thursday that Fay could swap with if the conditions described above are still to be met?

- A** Mel
- B** Pat
- C** Rod
- D** Sam
- E** Tim

- 20** Students studying geography at college were tested at the start of the year and at the end of the year. Their marks are shown in the following table.

<i>student</i>	Ffion	Gary	Huw	Ivy	Jim	Ken	Lee	Mei	Naz	Oli	Pete	Quin
<i>starting mark</i>	60	48	40	30	70	48	65	60	25	85	40	80
<i>end mark</i>	56	50	35	45	80	60	70	80	25	95	50	85

The following scatter graph shows the marks for the 12 students, but one of the points has been incorrectly plotted.



Which student has a mark that is incorrectly plotted on the scatter graph?

- A** Ffion
- B** Gary
- C** Huw
- D** Ken
- E** Mei

- 21** Some people have such good natural stamina that they can run a marathon with no training. John was able to run a marathon on Saturday. It is possible he did no training in preparation.

Which one of the following most closely parallels the reasoning used in the above argument?

- A** Some experts believe that putting bath salts in the bath increases the likelihood of someone getting eczema. Charlie has eczema. It is likely he puts bath salts in his bath.
- B** Most superheroes have super powers which help them fight villains. Batman doesn't have any super powers. Therefore he is not a superhero.
- C** Frogs do not survive in ponds with duck weed. Mustafa has a pond in his garden with frogs living in it. It is possible that Mustafa's pond has frogs and no duck weed.
- D** It is possible to get lung cancer without ever being a smoker. Jill has got lung cancer. Therefore, she may not be a smoker.
- E** Some trees can be killed by hammering iron nails into them. Oswald's tree died. Therefore, he must have hammered an iron nail into it.

- 22** In a recent UK news broadcast, a white reporter appeared to mistake a Labour Member of Parliament (MP), who is Black, for another MP who is also Black. This shows the dangers of a lack of diversity in workplaces. It is not the first time that such a mistake has occurred: a week earlier the same television channel had mistakenly shown footage of LeBron James in their coverage of the death of his fellow basketball star Kobe Bryant. A recent report showed that only 14.8% of that television channel's workforce were from a minority ethnic or racial background. Media organisations in the UK should take this as a wake-up call, and take steps to ensure that the diversity of their workforce mirrors that of the wider population.

Which one of the following is an underlying assumption of the argument above?

- A** A reporter of the same racial background as the MPs would not have made this type of mistake.
- B** Mistakes like the ones identified in the passage are common in the media.
- C** Media organisations have a moral duty to ensure they have a diverse workforce.
- D** Having a more diverse workforce enables mistakes like these to be avoided.
- E** Similar types of errors do not take place in any other workplace.

- 23** Recent figures issued by the UK Department of Education have revealed that the proportion of students with special educational needs and disabilities (SEND) who have reached the expected level of educational achievement by the time they leave secondary school is lower than that of the population as a whole. The Government cannot evade responsibility for this disappointing statistic. By not providing the funds required by schools who have students with these needs, the Government has failed to ensure the right of such students to equality of opportunity.

Which one of the following, if true, most weakens the above argument?

- A** Some students with SEND have problems with reading and writing but have good ability to understand and reason.
- B** Some students with SEND require a quiet environment to help them to concentrate on what they are doing.
- C** Some students with SEND require content and tasks from lessons to be explained to them in simpler language.
- D** Some students with SEND have physical problems which require the provision of a wheelchair or other aids.
- E** Some students with SEND have conditions which limit their ability to understand and to reason.

- 24** Iman and Maya ran a 100 metre race. Iman started 2 seconds after Maya and finished 3 seconds before her.

If each girl ran at a constant speed throughout the race, and Iman's speed was 25% faster than Maya's, for how many seconds did Iman run?

- A** 15 seconds
- B** 18 seconds
- C** 20 seconds
- D** 22 seconds
- E** 25 seconds

- 25** Five popular makes of fishcake are shown in the table below, with comparisons of their ingredients, the weight of each type and the cost for a pack of two.

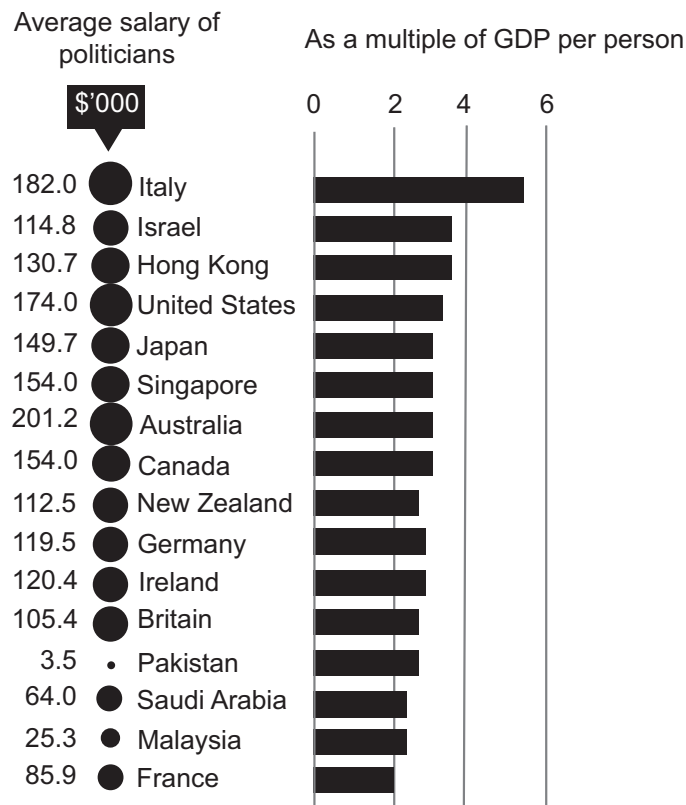
<i>type</i>	<i>ingredients in fishcake</i>			<i>weight of each fishcake</i>	<i>cost of pack of 2 fishcakes</i>
	<i>fish</i>	<i>potato</i>	<i>coating</i>		
Arctic	45%	40%	15%	100 g	£3.00
Banquet	40%	50%	10%	100 g	£2.50
Chilco	55%	35%	10%	150 g	£5.00
Dyner	50%	35%	15%	150 g	£4.00
Evertop	35%	45%	20%	50 g	£1.00

Ester wants to buy the fishcakes that contain the greatest amount of fish per pound spent.

Which make of fishcake should Ester buy?

- A** Arctic
- B** Banquet
- C** Chilco
- D** Dyner
- E** Evertop

- 26** The following chart shows the average salary of politicians in selected countries in absolute terms on the left (in thousands of dollars) and as a multiple of their country's gross domestic product (GDP) per person on the right.



What is the difference between the highest and lowest average salaries of politicians in the countries listed above?

- A** \$96 100
- B** \$115 300
- C** \$175 900
- D** \$178 500
- E** \$197 700

- 27** Trains in the UK are operated by private companies approved by the government and awarded a franchise for which they must meet certain standards, for example on punctuality. SuperRail, which operates the trains in one part of the country, has a poor record to date and has been warned that if it again exceeds the annual limits set by the government for late departures or arrivals, it will receive a heavy fine and will lose its franchise. At the end of the third quarter, however, SuperRail's performance was within the defined limits. So if the operator can maintain their performance in the final quarter, they will keep the franchise for another year.

Which one of the following best illustrates the flaw in the above argument?

- A** It draws a conclusion about what will happen from something that may or may not happen.
- B** It assumes that there are no other reasons why a rail franchise might be lost.
- C** It predicts what will happen in the future on the basis of what has happened to date.
- D** It denies the possibility that the company may exceed the limits and still keep the franchise.
- E** It concludes that the franchise will be kept but not that the fine will be avoided.

- 28** If you arrive late for work, you will definitely get fired. You lost your last job so you must have arrived late for work.

Which one of the following most closely parallels the reasoning used in the above argument?

- A** If you turn up the volume, the music gets louder. The music is very loud now which means that you turned up the volume.
- B** If a company wants to be successful, it needs to insist on the punctuality of its employees. This company does not take the punctuality of its employees seriously, so it will not be successful.
- C** Disciplinary action is initiated against all workers who do not wear a helmet on the building site. No disciplinary action has been initiated against Mike, so he must have always worn a helmet on the site.
- D** You need a membership card to use the services of the gym. You do not have a membership card, so you cannot use the gym.
- E** In order to anger a hippo, it is enough to drive close to it with a boat. They are driving close to this one, thus it will become angry.

- 29** 'Progressive' teaching methods – used in schools for the last 40 or 50 years – put an emphasis on collaborative ways of learning. It is time to reconsider the idea that this constitutes best practice in the classroom. Collaborative learning appeals to those with extrovert personalities, but much less so to introverts. Extroverts are people with an outgoing or gregarious personality, who enjoy group projects and plenty of stimulation, whereas introverts prefer to work on their own and in a quiet place. Modern classroom environments embrace extroverted behaviour, through fast-paced lessons and social learning activities. These can foster an appealing classroom environment, of course, but over-emphasising them can undermine the learning of students who are inward-thinking and easily drained by constant interactions with others.

Which one of the following best expresses the main conclusion of the above argument?

- A** Progressive teaching methods put an emphasis on collaborative learning.
 - B** The idea that collaborative learning is best classroom practice needs to be reconsidered.
 - C** Collaborative learning appeals to extroverts, but much less so to those with introvert personalities.
 - D** Extroverts and introverts learn best in very different ways.
 - E** Over-emphasising fast-paced lessons and social learning undermines the learning of introverts.
- 30** In a prize draw, tickets are printed with 3-digit numbers from 001 to 999. Contestants pay to take a ticket at random. A major prize is awarded for all tickets where the product of the 3 digits on the ticket drawn is 8 and a minor prize is awarded when the product is 12. For example 143 wins a minor prize because $1 \times 4 \times 3 = 12$.

What is the maximum number of major prizes which could be won?

- A** 7
- B** 9
- C** 10
- D** 13
- E** 14

- 31** The table shows the cost of hot drinks in a local café.

<i>hot drinks</i>		
<i>tea</i>	<i>coffee</i>	<i>chocolate</i>
£1.50	£2.50	£3.00

Belle bought a number of hot drinks, including at least one of each tea, coffee and chocolate. She was charged £32.00.

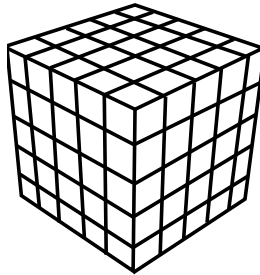
If she bought the same number of teas as coffees, what was the maximum number of hot drinks that Belle could have bought for the £32.00?

- A** 9
- B** 10
- C** 12
- D** 13
- E** 14

32 I have a wooden cube with edges that are 5 cm long. I paint it in the following way:

- one pair of opposite faces is red
- one pair of opposite faces is green
- one pair of opposite faces is blue

Now I cut the cube into small cubes, each of whose edges are 1 cm long, in the following manner:



How many of the small cubes have one green face, one blue face, but no red face?

- A** 6
- B** 8
- C** 12
- D** 16
- E** 24

- 33** The UK has one of the world's highest levels of regional inequality, according to a recent report. Of the 30 nations studied, only 2 had higher levels of inequality. The main disparity is between those living in the poorer north and the wealthier south of the country. To address this, the government has been working on a large infrastructure project, HS2, which will improve transport links between cities in the north and south. However, the report warns that this project will only benefit the large cities, as journey times to areas outside those cities will continue to be affected by poor local transport infrastructure. The project will do nothing to benefit those living in smaller towns and villages in the north of the country, and so should be suspended immediately.

Which one of the following is an underlying assumption of the above argument?

- A** There is no need for larger cities in the north of England to have quicker links to the south.
- B** Improving transport links is the method by which regional inequality has to be addressed.
- C** The benefits to large cities are not sufficient to justify the project.
- D** The level of regional inequality in the country is a problem that needs to be solved.
- E** People generally do not enjoy a lengthy commute to work.

- 34** A right is not an excuse. The fact that you have a right to do something cannot count as justification for doing it. I may have a right to walk along behind someone in the street, mimicking their walk. Does that mean I ought to go around doing this? In fact, when deciding how to act, it isn't really rights we should be turning to in order to guide our decisions, but morals. You should not be asking: do I have a right to do this? Instead you should be asking: is it right that I should do this?

Which one of the following best illustrates the principle used in the above argument?

- A** A person who fails to carry out a friend's dying wishes because they feel there is something morally wrong in the request has nevertheless failed to fulfil their moral duty.
- B** A person who drives dangerously without considering the dangers and ends up hurting someone else is morally blameworthy even if they had no intention to do so.
- C** A person who rejoices when a colleague goes through a hard time at work is still behaving badly, even if that person had previously caused them harm.
- D** A person who upsets someone else by criticising their appearance cannot simply defend their action on grounds of freedom of speech.
- E** A person who listens to their heart rather than their head when faced with a personal dilemma will not make the right decision.

- 35** It is no surprise to hear that we are more likely to help someone we like than someone we don't. But another factor that influences our behaviour towards others is a sense of reciprocity – the sense that you ought to do something good for someone if they have done something good for you. Psychologists have measured the effect of how much someone (Person 1) likes another person (Person 2) on the extent to which Person 1 will help Person 2 out. While there is a clear correlation here, it fades away in situations where Person 2 had previously done Person 1 a favour. In these cases, Person 1 consistently helps Person 2 out equally, regardless of how much they like them.

Which one of the following can be drawn as a conclusion from the above passage?

- A** It is always a good idea to help other people out if you possibly can.
- B** How much a person likes another person is less of a motivating factor in human behaviour than psychologists had supposed.
- C** Reciprocity is the most important motivation behind human behaviour.
- D** People who help others out are more likely to end up better rewarded than people who don't.
- E** A person who does not receive help from someone will feel no obligation to offer help in return.

- 36** Grandma has spent £60 on five books which she is intending to give to her three grandchildren, Miya, Harriet and Mehran. She is going to give the books in a way that relates the cost to the time they normally spend reading (i.e. spend the most on the child who reads the most). Miya reads for an hour a day. Harriet reads for an hour a day on Monday to Thursday and 2 hours a day on Friday to Sunday. Mehran doesn't read on weekdays but does an hour and a half on each of Saturday and Sunday. The details of the books are shown in the table below.

<i>title</i>	<i>cost</i>
Hungry Dinosaurs	£8
The Celebrated Six	£9
Fly Away	£13
Come Back	£14
The Biraffe	£16

Which one of the following statements is true?

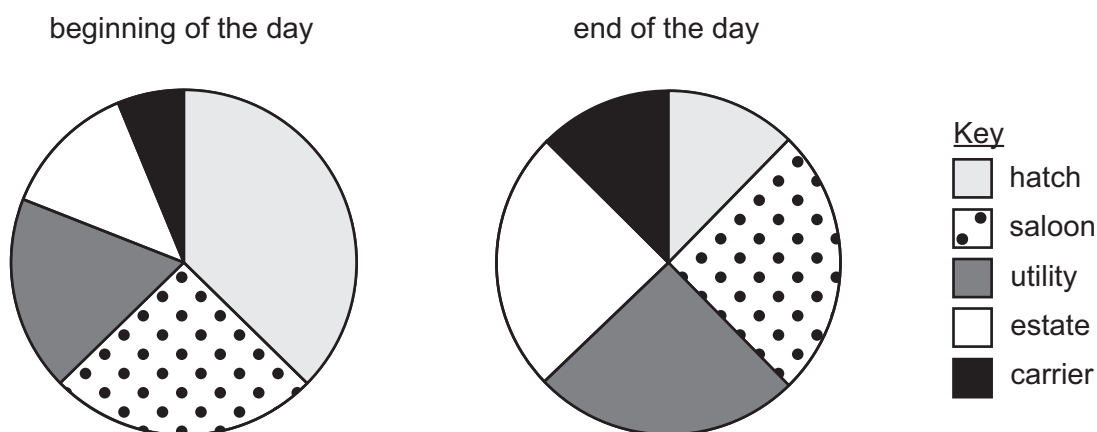
- A** Harriet was given 'The Celebrated Six'.
 - B** Harriet was given 'Fly Away'.
 - C** Mehran was given 'The Biraffe'.
 - D** Miya was given 'Come Back'.
 - E** Miya was given 'Hungry Dinosaurs'.
- 37** In a ball game points are accumulated by different combinations of four winning shots called a chop, a creamer, a glink and a yip. Playing the game for the first time, the only knowledge I have about the scoring system is that a chop is worth one point more than a creamer, and a creamer is worth twice as many points as a glink. I lose narrowly by 47 points to 50, scoring 3 chops, 4 yips, 3 creamers and 4 glinks. My victorious opponent scored 5 chops, 3 yips, 3 creamers and 2 glinks.

Which one of the following statements about the scoring system is the only one that is true?

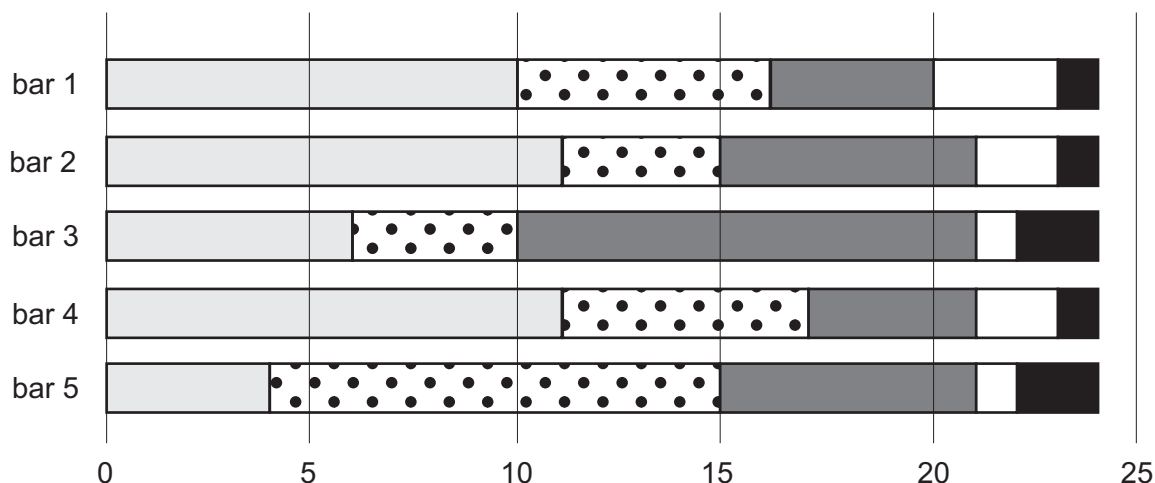
- A** A creamer is worth more points than a chop.
- B** Two chops are worth less than three yips.
- C** A glink is worth 2 points.
- D** Three yips are worth more than three creamers.
- E** A chop is worth 6 points.

- 38** At the beginning of the day, a showroom had 32 vehicles for sale. The vehicles were advertised in five categories: hatchback, saloon, utility, estate car and people carrier. By the end of the day, 24 vehicles had been sold.

The first chart shows a comparison of the numbers of vehicles in each category in the showroom at the beginning of the day, and the second chart shows a comparison of the numbers in the same categories in the showroom at the end of the day.



Which one of the following shows a comparison of the numbers of cars in each category that were sold?



- A** bar 1
- B** bar 2
- C** bar 3
- D** bar 4
- E** bar 5

- 39** If someone tries to rescue someone from a burning roof, slips, drops them, and they die, we don't class them as a murderer. This is because we believe that judgements should be based on the intention behind an action, not the outcome. Whether or not we like to admit it, however, our moral judgements are sometimes shaped by mere luck. Imagine someone gets into a car while drunk and drives home. We all agree that's bad. Now imagine another person who does the same, but this person kills a pedestrian. We naturally think that this action is worse. But surely the only difference is that the first driver got lucky, while the second driver was unlucky. The second driver did not intend to kill a pedestrian any more than the first did.

Which one of the following best expresses the main conclusion of the above argument?

- A** If someone accidentally kills someone while trying to rescue them we don't consider them a murderer.
- B** We believe that judgements about the morality of an action should be based on the intention behind it.
- C** Despite what we may like to think, our moral judgements can be influenced by luck.
- D** The only difference between the two drivers is that the first driver got lucky.
- E** The second driver did not intend to kill someone any more than the first did.

- 40** Should we be worried about Artificial Intelligence (AI)? On the one hand, there are big names that have expressed major concern. Elon Musk, Bill Gates and Stephen Hawking have all argued that AI poses the single biggest threat to mankind's existence. At the same time there are people such as Mark Zuckerberg (Facebook CEO) and leading AI researcher Andrew Ng, who reject this view as scaremongering, and insist that the risks behind AI can be eliminated by following a few simple rules. Clearly they cannot both be right, meaning that the truth must lie somewhere in the middle: AI cannot be without risks, but nor can it be the apocalyptic threat some say it is.

Which one of the following best illustrates the flaw in the above argument?

- A** Just because people are household names, it does not mean they have the relevant expertise, or that their views are worth taking seriously.
- B** It relies on the views of people who are likely to be biased in relation to AI.
- C** It fails to consider whether the development of AI is indeed a genuine possibility.
- D** The fact that both sides in the dispute can't be right doesn't mean that neither of them is.
- E** It does not state what the rules around AI should actually be.

- 41** In recent years, televised debates between political candidates have taken on increasing significance in the elections held in various countries. Meant to encourage public participation in elections and help voters evaluate the candidates seeking their support, these events are not much more than noisy distractions. Rather than revealing more about positions and policies on important political issues, the debates put the spotlight squarely on candidates' social skills. Accordingly, media coverage of the debates tends to focus on how well candidates engage with one another, those asking the questions, and any audience members in attendance. But showcasing the ability – or inability – of candidates to demonstrate a desirable balance between being assertive and cooperative does little to help voters understand the leadership potential of those taking part.

Which one of the following is an underlying assumption of the above argument?

- A** There is no shortage of accessible means by which voters can gain relevant information about candidates.
- B** Media companies have a financial interest in promoting televised debates.
- C** Social skills are not a good indicator of leadership potential.
- D** The televised debates encourage voters to rely on gender and other stereotypes when evaluating candidates.
- E** Some high-quality candidates are discouraged from entering elections because of the emphasis on televised debates.

- 42** In my currency, there are six types of coin in circulation:

200p 100p 50p 20p 10p 5p

I start with two coins. I visit a shop and purchase two bars of chocolate and pay using the two coins. My change consists of two coins.

The next day I re-visit the shop and purchase another one bar of chocolate with that change. My new change, again, consists of two coins.

The six coins I possess during these two days are all different. I only have two coins at any particular time. The price of a bar of chocolate does not change.

What is the price of a bar of chocolate?

- A** 15p
- B** 25p
- C** 30p
- D** 55p
- E** 60p

- 43** In a game, players take it in turns to place tokens onto squares of a grid. The squares on the grid are coloured white and grey. When a player places a token they score one point for every token on an adjacent square (either horizontally or vertically). For every adjacent square that is white an extra point is scored.

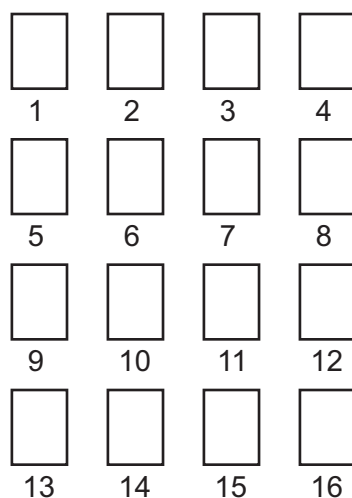
The diagram below shows a position in one game. The number on each square shows the number of tokens currently placed on that square:

3	1	5	1	2
1	2	0	4	5
2	1	2	3	1
1	2	2	5	2
5	4	3	2	4

What is the maximum number of points that could be scored when the next token is placed on the board?

- A** 10
- B** 11
- C** 12
- D** 13
- E** 14

- 44 In *Cat and Mouse*, a game for two players, 16 cards are shuffled and then placed face down on a table as shown below:



[The numbers below the cards are for identification purposes.]

Cats are pictured on 8 of the cards and mice on the other 8. Both players pick up two cards at each turn, taking care not to show the cards to the other player. If the two cards are a cat and a mouse, the player **keeps the cards** and scores a point, but does not reveal which was the cat and which was the mouse. If, however, the two cards are both cats or both mice, the player must put the cards back in the same places.

My sister and I are currently playing a game, and I am leading by 3 points to 2. The game has progressed so far as follows:

me	cards 2 & 13	cat and mouse pair	1 point
sister	cards 7 & 16	cards replaced	
me	cards 5 & 11	cat and mouse pair	1 point
sister	cards 10 & 12	cards replaced	
me	cards 3 & 8	two mice; cards replaced	
sister	cards 7 & 14	cat and mouse pair	1 point
me	cards 1 & 15	cat and mouse pair	1 point
sister	cards 8 & 10	cat and mouse pair	1 point

It is my turn again and I know for certain that the two cards I am going to pick up will be a cat and mouse pair.

Which two cards am I going to pick up?

- A 3 & 4
- B 3 & 6
- C 3 & 9
- D 3 & 12
- E 3 & 16

- 45 If he was telling the truth about the incident, then we would not expect him to look so nervous talking to the police. The fact that he looks so nervous suggests he is probably lying.

Which one of the following most closely parallels the reasoning used in the above argument?

- A If everyone who found themselves in the same position as Zach behaved the same way that he did, then we would be in an absolutely terrible situation. Fortunately for us, not everyone does behave in that way.
- B The volume of waste they generate shows that most coffee companies do not care about the environmental impact of their businesses. If they did, they wouldn't serve coffee in disposable cups.
- C If Bella really wanted to come to the party, then she would have told Anne. Unfortunately, since we are unable to contact Anne, we can't know if Bella really wanted to come.
- D If Einstein's theory of relativity is correct, then we would expect light rays from distant stars to bend as they pass our own star. The fact that we are able to observe this suggests Einstein's theory is correct.
- E No one who saw the game on Saturday would have thought it was between two sides at the very bottom of the league. If you'd seen the game, you would have agreed that the standard of football was impressively high.

- 46 On Sports Day at St Jude's College points are awarded in each event as follows:

1st place	10 points
2nd place	6 points
3rd place	3 points
4th place	1 point

Each student may enter a maximum of three events.

What is the lowest score that is **not** possible for a student to achieve?

- A 15
- B 22
- C 24
- D 27
- E 31

- 47** One vision dominating much of urban planning worldwide is that of the ‘smart city’, whereby urban areas are pre-planned and designed to be managed via digital technology with efficiency prioritised as the top objective. But planners cannot foresee how cities will need to develop depending on cultural trends, changes in economic sectors, and other factors. We lose something important if we over-plan and over-manage our cities. The concept of the city as a pre-engineered machine works against critically important quality-of-life considerations. Once basic services, like transport, are in place, urban dwellers value community cohesion, opportunities for self-expression, and other quality-of-life features as much as or even more than efficiency. Such elements require openness, freedom of choice, and the opposite of central control in order to blossom.

Which one of the following best expresses the main conclusion of the above argument?

- A** Planners cannot foresee how cities will need to develop in response to various factors.
- B** We lose something important if we over-plan and over-manage our cities.
- C** The concept of the city as a pre-engineered machine works against important quality-of-life considerations.
- D** Urban dwellers value community cohesion and other quality-of-life features as much as or even more than efficiency.
- E** Community cohesion and other quality-of-life features require openness, freedom of choice, and the opposite of central control in order to blossom.

- 48** My three friends bought food at the supermarket. When I asked them, they did not remember the prices of the items, only the final amount they paid.

- Hector paid \$3.50 for 3 bread rolls and 1 apple.
- Lee paid \$8.00 for 1 apple and 4 chocolate bars.
- Olga paid \$3.50 for 1 bread roll and 2 chocolate bars.

I want to buy 1 bread roll, 1 apple and 1 chocolate bar.

How much do I need to pay?

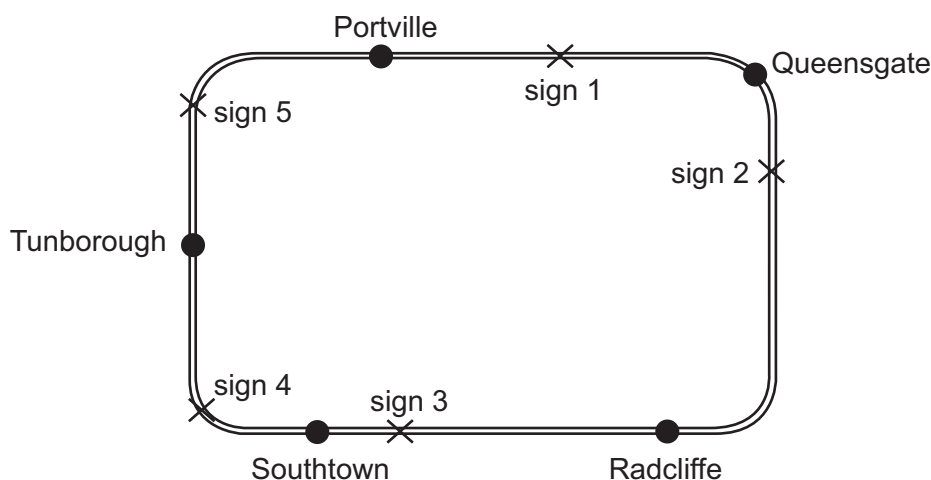
- A** \$3.00
- B** \$3.50
- C** \$4.00
- D** \$4.50
- E** \$5.00

- 49** The government has recently announced that the method by which the British Broadcasting Corporation (BBC) is funded will be changed, leading to speculation that public funding for the organisation could soon be withdrawn. One of the complaints is that BBC TV and radio presenters “make their profile at public expense”, but then earn income on top of their salaries by charging to speak at events to which they are invited purely due to their association with the BBC. However, figures show that, over the last five years, Members of Parliament (MPs) received £8.4m on top of their salaries through similar activities. Until MPs can behave in a way that is consistent with their criticisms of others, this policy to change the funding of the BBC should be scrapped.

Which one of the following, if true, most weakens the above argument?

- A** BBC presenters make up a small proportion of all people invited to speak at events.
- B** Many MPs were established public figures before they entered Parliament.
- C** Many MPs have second or third jobs outside Parliament.
- D** Invitations to BBC presenters to speak at public events do not continue once the presenter has left the BBC.
- E** The BBC issues clear guidelines to its employees about the types of events that they are allowed to speak at.

- 50 There are five towns at various positions along a major ring road that encircles a city. Traffic travelling clockwise around the ring road is provided with information in the form of five 'distance' signs at various points along the road as shown.



The signs display the following information (all distances in km):

sign 1	sign 2	sign 3
Queensgate 10	Radcliffe 17	Southtown 4
Radcliffe 32	Southtown 34	Tunborough 19
Southtown 49	Tunborough 49	Portville 43
Tunborough 64	Portville 73	Queensgate 62
Portville 88	Queensgate 92	Radcliffe 84

sign 4	sign 5
Tunborough 9	Portville 13
Portville 31	Queensgate 32
Queensgate 52	Radcliffe 54
Radcliffe 74	Southtown 71
Southtown 91	Tunborough 86

One of the signs contains an error in one of the distances indicated.

Which one of the signs contains the error?

- A sign 1
- B sign 2
- C sign 3
- D sign 4
- E sign 5

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