

Thinking Skills Assessment Oxford

4502/11

Wednesday 2 November 2016

1 hour 30 minutes

SECTION 1

Thinking Skills Assessment

INSTRUCTION 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 points for correct answers, so you should attempt all 50 questions. All questions are 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.

Any rough work should be done on this question paper. No extra paper is allowed. Dictionaries and calculators may NOT be used.

UNIVERSITY OF
OXFORD

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This paper consists of 36 printed pages and 4 blank pages.

PV1

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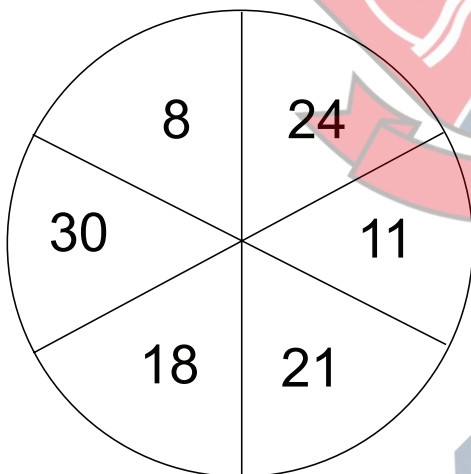
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- 1 We need to accept flooding as a regular occurrence in the UK. Statistics show that days of 'extreme rain' (very heavy rainfall) have become more common since 1960, moving from one in a hundred days on average in the 1960s to one in seventy days in 2015. The apparent trend mirrors increases in extreme rain seen in other parts of the world. Countries such as India and China expect and prepare for this, but in the UK we have to change our thinking and plan our infrastructure to cope with it. The damage caused to homes and businesses as well as the risk of injury and death through flooding are very significant. Scientists say that, as the world has warmed by 0.7°C , the atmosphere is able to hold 4% more moisture, which means more potential rain.

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

- A The UK has been underprepared for the effects of flooding.
- B The UK could learn from countries such as India and China about flood defences.
- C Global warming could be halted if there was political will.
- D The UK must plan its infrastructure to deal with a high risk of flooding.
- E The world temperature will continue to rise in the future.

- 2 An unusual dartboard is used in a playground game:



In order to win the big prize, contestants must score exactly 50 with three darts, all of which must be in different sectors.

Which number **must** they hit with one of the three darts in order to score 50?

- A 8
- B 11
- C 18
- D 21
- E 24

- 3** Researchers have discovered the first physical evidence of structural brain differences that distinguish early risers from people who like to stay up late. Around 10 per cent of people qualify as 'morning people' or 'larks', and a further 20 per cent are 'night owls' – with the rest of us falling somewhere in between. The brain differences might help to explain why 'night owls' seem to be at greater risk of depression than 'larks'. Brain scans have shown 'night owls' have a lower quality of white matter (tissue largely comprised of fatty insulating material that speeds up the transmission of nerve signals) in areas of the brain associated with depression. 'Night owls' should try to adjust their sleep patterns if they wish to avoid mental health problems.

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

- A** It fails to refer to the brains of those who fall between 'lark' and 'night owl' types.
- B** It ignores the fact that depression is very common in the population.
- C** It assumes that changing one's sleep pattern will cause a change in the quality of white matter.
- D** It implies that 'night owls' would wish to change their sleep patterns.
- E** It associates depression with other mental health problems.

- 4** There have been a growing number of calls to phase out the smallest denomination coins. The single penny is almost useless for purchasing items by itself. It would be simpler if prices were rounded to the nearest five pence and this would reduce the amount of small change carried around. But this view does not take into consideration that this will inevitably lead to price increases. Very few people would be concerned about paying £1 instead of 99 pence, but it is not the consumer who benefits from the 1% price increase. A single penny may not be worth much, but those who save them do eventually have enough to purchase something useful. There are many charities that also benefit from these small coins as donations.

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

- A** Small denomination coins should be donated to charity.
- B** Coins are an unimportant part of currency.
- C** People should not worry about price increases if small coins are withdrawn.
- D** People should be encouraged to save their small denomination coins.
- E** Consumers and charities would lose out if small denomination coins were withdrawn.

- 5 There is a lot more to interpreting and recognising faces than you might think. Forgetting people we used to know is not that uncommon, and is something we are in fact all guilty of. But next time you're standing in the supermarket having a conversation with someone you don't recognise but act like you remember them, take heed that the likelihood is that they will know you are lying. Lying is a lot harder than most people realise, and hiding the fact we are lying is harder still. This is because we all make brief, involuntary facial expressions when we try to conceal or repress something, such as trying to remember someone. These have been termed micro-expressions. So when someone you don't recognise starts talking to you, you should just confess straight away because your micro-expressions will probably give you away anyway.

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

- A When someone that you don't recognise starts to talk to you, it is never because they have mistaken you for someone else.
- B People are able to recognise the micro-expressions that show that someone is lying.
- C People would prefer to know that they have not been recognised rather than have someone pretend to know them.
- D The person talking to you will not be embarrassed that you did not recognise them.
- E People who are talking to someone that they know never lie.

- 6 I have booked a flight from London to Auckland, which is in a time zone 12 hours ahead of GMT. I am due to leave London at 17:30 GMT on 19 August and will arrive in Auckland at 06:15 on 21 August (local time). My journey includes a 1-hour stop in Los Angeles and a 1.5-hour stop in Hawaii.

How many hours am I due to spend in the air?

- A $12\frac{3}{4}$
- B $22\frac{1}{4}$
- C $23\frac{1}{4}$
- D $24\frac{3}{4}$
- E $34\frac{1}{4}$

- 7 Anton wants to ride one of the top 8 roller coasters in the world to celebrate his 13th birthday. The top 8 roller coasters are spread around the world. Anton has to decide which roller coaster to visit, taking into consideration:

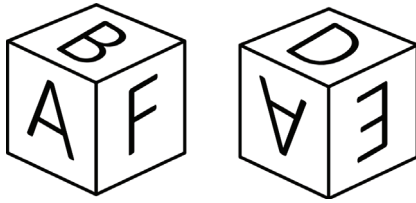
- Anton's height: 143 cm
- \$400 maximum for two one-way flights
- The roller coaster must reach at least 90mph
- Queue time is no longer than 40 minutes

<i>Roller coaster location</i>	<i>Min height requirement (cm)</i>	<i>Speed (mph)</i>	<i>Highest drop (ft)</i>	<i>Flight cost (one way) (\$)</i>	<i>Average queue time (mins)</i>
Ring Racer, Rheinland-Pfalz	140	135	123	688	13
Dodonpa, Yamanashi	121	107	170	400	25
Goliath, California	155	85	235	267	50
Superman, California	122	100	415	267	33
Intimidator 305, Virginia	145	90	305	188	24
Top Thrill Dragster, Ohio	150	120	420	99	27
Voyage, Indiana	138	67	154	102	10
Kingda Ka, New Jersey	122	128	456	56	39

Which roller coaster will Anton choose to ride?

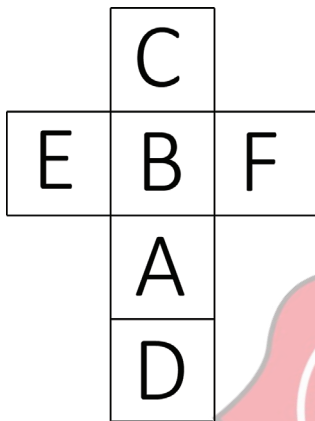
- A Intimidator 305
- B Dodonpa
- C Kingda Ka
- D Superman
- E Voyage

- 8 A cube is labelled with six letters and, when viewed in two positions, looks like this:

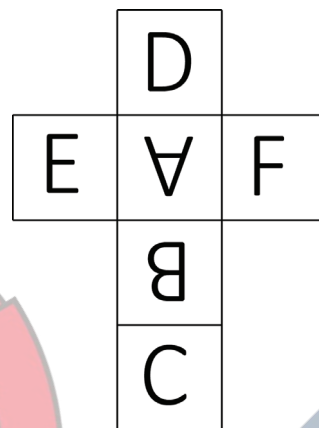


Which one of the following nets could be folded to make the above cube?

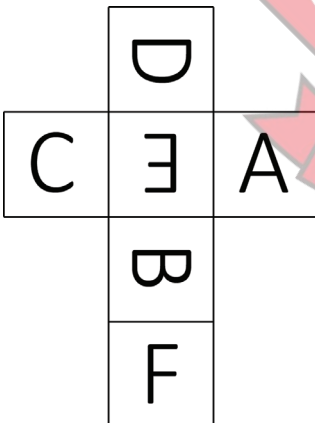
A



B



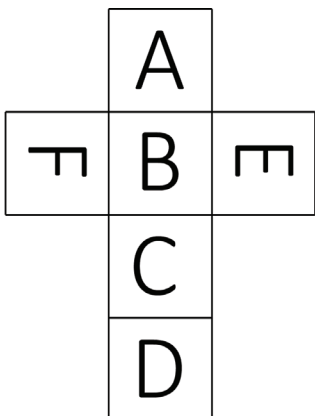
C



D



E



- 9 The health service urgently needs more blood donors to meet demands on its 'blood bank' for transfusions. Most of us ignore this need, but we are only too glad to receive the blood of other donors in emergencies. To boost the blood bank, transfusions should only be given to those who have indicated they are donors or agree to become donors. In this fairer system, receiving and giving within the blood service would become clear in everyone's mind and the blood bank given all the donations it needs.

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

- A Some people are ineligible to give blood.
- B There is greater demand for certain blood types.
- C A high proportion of existing blood donors have themselves had blood transfusions.
- D Blood donations are at an all-time low.
- E Many people are wary of receiving blood because of infections.

- 10 A recent study has found that those businesses which engaged more with social media had more financial success than businesses which did not. The businesses which were the most engaged saw their revenue grow by 18 per cent over the last year, while the least engaged saw losses of 8 per cent. Since social media is the future of communication, it can be seen that businesses should interact more with social media in order to maximise their profits.

Which one of the following is the best statement of the flaw in the above argument?

- A It ignores the fact that not all businesses use social media.
- B It assumes that businesses that do not use social media will collapse.
- C It assumes that participation in social media causes an increase in profits.
- D It ignores the fact that businesses can use other forms of communication.
- E It assumes that a growth in revenue of 18 per cent is possible for all businesses.

- 11** The apostrophe has limited usefulness as a punctuation mark, so it will be no loss if it disappears altogether from the English language. The fact that it can't be heard at all in speech suggests we can make our meaning clear without it. It is already disappearing from much business correspondence without commerce grinding to a halt. The apostrophe is also widely misused, which is surely another measure of its unimportance. Many people apparently think it belongs in any word that ends with an 's', as demonstrated by this sign seen in an off-licence window: 'Beer's, wine's and spirit's at pre-budget price's'. Yet judging by the queue in the shop, nobody had failed to get the message that there were bargains to be had.

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

- A** It doesn't matter whether we use the apostrophe correctly or not.
- B** It will be no loss if the apostrophe disappears from English punctuation.
- C** The apostrophe is particularly unnecessary in business correspondence.
- D** There is no sound in speech that corresponds to the apostrophe.
- E** We should all stop using apostrophes from now on.

- 12** Three night security guards, Robert, Sheila and Tom, are assigned to guard a factory for five consecutive nights, Monday night to Friday night inclusive.

Two of the guards are to be on duty each night. Tom must be on duty for four nights and Robert and Sheila are on duty for three nights each. Regulations do not allow any guard to work for more than two consecutive nights.

If Robert is on duty on Friday night, then the nights when Sheila is on duty are

- A** Monday, Tuesday, Thursday.
- B** Monday, Tuesday, Friday.
- C** Monday, Wednesday, Thursday.
- D** Monday, Wednesday, Friday.
- E** Tuesday, Wednesday, Friday.

- 13** As a treat for my sixth birthday I am going swimming with my family next Saturday afternoon. My mum is a nurse and my dad is unemployed. My sister is three years younger than me and my brother is two years older but they will both enjoy the treat too. Grandma is coming but she will watch rather than swim. Grandpa loves swimming even though he is nearly 72 years old, so he will be in the pool enjoying the swim.

The charges at the local swimming centre are shown below:

Admission for:	Peak Times	Off-Peak Times
Adult	£3.80	£2.90
Unemployed Adult	£2.10	£1.50
Child/Senior Citizen (over 65 years)	£1.90	£1.50
Family ticket (2 adults and 2 children)	£9.50	£7.10
*Concession family ticket (2 adults and 2 children)	£4.80	£3.60
Family ticket (1 adult and 2 children)	£5.70	£4.30
*Concession family ticket (1 adult and 2 children)	£3.60	£2.85
Spectators	£0.70	£0.50
Under 4s	free	free

*Adults must be Unemployed or Senior Citizens

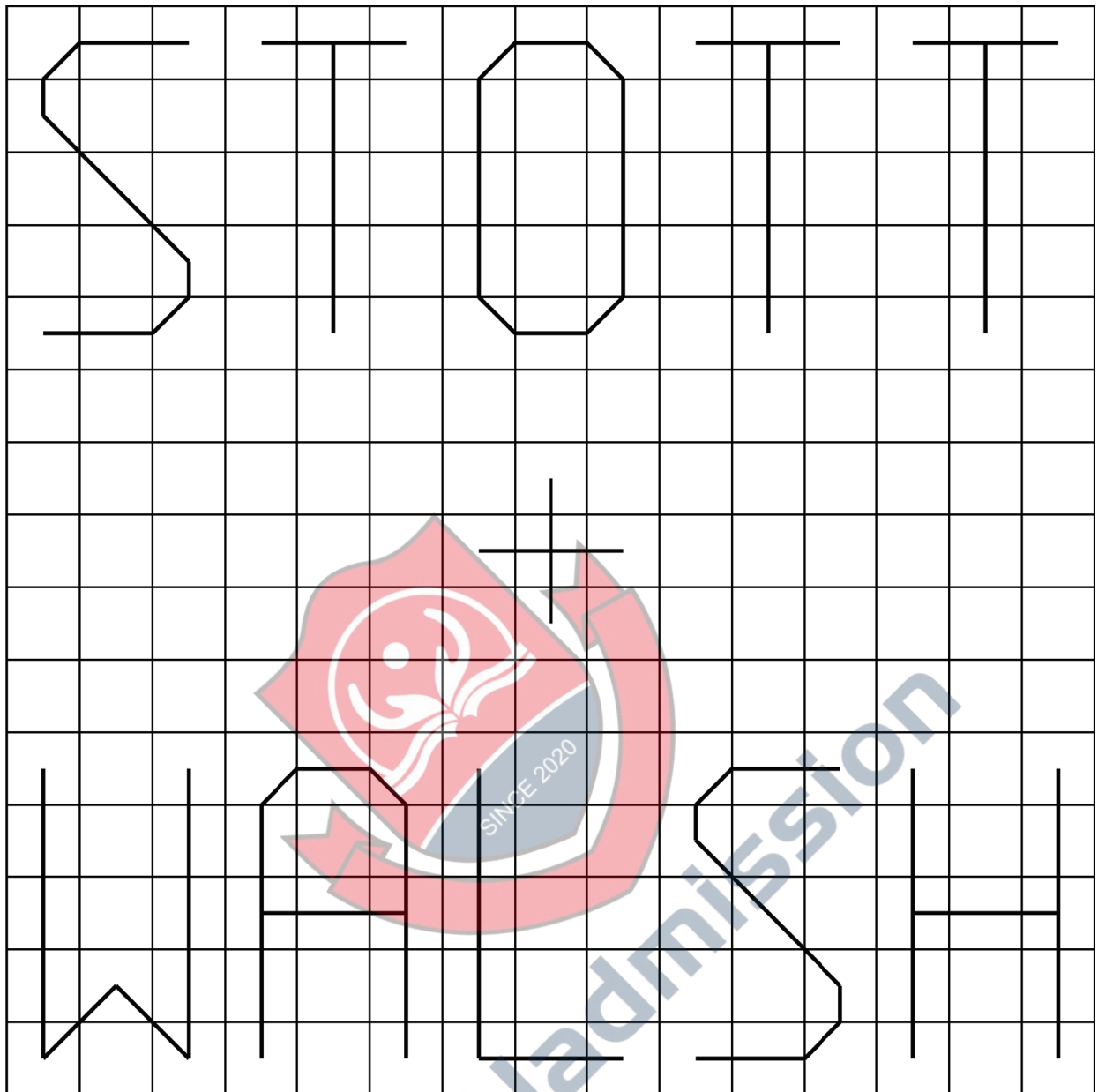
Off-peak – Monday to Friday 9 am to 5 pm

Peak – all other times and school holidays

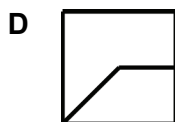
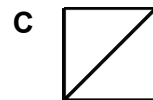
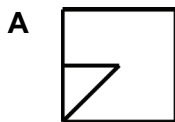
What is the lowest price that we could pay for our tickets?

- A** £7.00
- B** £9.10
- C** £9.30
- D** £12.10
- E** £12.30

- 14 The floor of the reception area of the head office of Stott and Walsh is tiled as shown below:



Which one of these tiles could **not** be used to replace a damaged tile on this floor?



- 15** Scientists at University College London investigating the effects of bedtime routine on child development asked children to complete a number of tests including basic number skills, reading out word cards, and constructing designs from flat or solid shapes. Although the hour that children went to bed had little or no effect on their performance, having no set bedtime often led to lower scores. The effect was most striking in three-year-olds, where boys and girls scored lower on reading, maths and spatial skills tests than children of the same age who kept to a more rigid schedule.

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

- A** The more fixed the bedtime routine, the better the child's intellectual development.
- B** Irregular bedtimes may disrupt cognitive development in young children.
- C** Parents ought to take more care when thinking about their children's bedtime.
- D** Reduced or disrupted sleep, especially if it occurs at key times in development, could have important impacts on health throughout life.
- E** Varying a child's bedtime routine is likely to lead to cognitive disorders.

- 16** The funding situation for educational provision in UK prisons is a national disgrace. Prisons provide free room and board, and inmates are frequently given access to the internet, cable TV, and gym facilities. At the same time, lengthy waiting lists exist for prison literacy classes, and ever increasing budget cuts put pressure on prison library resources. Meanwhile, it is estimated that at least half of UK prisoners possess a reading age of eleven or less. If society wants to reduce the chances of prisoners reoffending upon their release, we must give them the opportunity to develop the literacy skills they need to build a successful life outside prison.

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

- A** Prison is too easy for inmates.
- B** There is no educational value associated with watching TV or using the internet.
- C** Education is a right, not a privilege.
- D** Prisoners have lower levels of intelligence than those of the general population.
- E** Prison sentences should aim to rehabilitate criminals, not just punish them.

- 17 Some say that religion is crucial for providing us with a moral framework, for giving clear strong moral guidance. Without religion, some say, people might lose their sense of morality altogether. But those who argue this ought to consider the Ancient Greeks. The Greeks pondered obsessively the question of what makes a good life and how to live well. In fact the word 'ethics' comes from them. And although they had their own set of gods, those gods were hardly moral role models (Zeus himself was a serial adulterer). Moreover, there was nothing by way of an agreed religious text from which to obtain their moral rules. There was even an atheist movement in Ancient Greece. The Greeks alone are proof that if we are to lose our faith in God, this does not mean we must also lose our faith in morality.

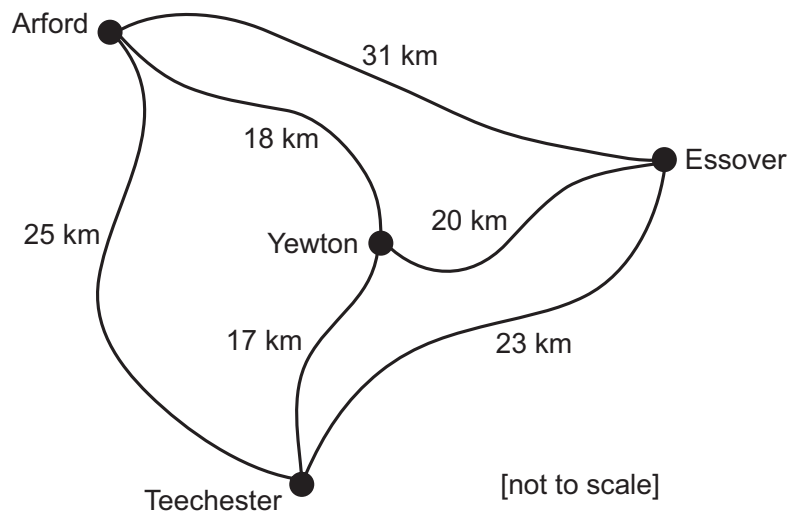
Which one of the following, if true, most weakens the above argument?

- A Some Greek gods were capable of great and heroic deeds.
- B The Ancient Greeks took their moral guidance as much from poetry and drama as from religion.
- C Many Ancient Greeks questioned the value or purpose of being moral.
- D In many parts of the world faith in God is currently getting stronger.
- E Believers often disagree about how best to interpret their own religious text.



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- 18 This diagram shows the roads that connect four towns and the distances involved.



I live in Essover. This afternoon I have to visit clients in Arford, Teechester and Yewton before returning to Essover. It does not matter in which order I visit the clients.

What is the minimum distance I could travel this afternoon?

- A 78 km
- B 83 km
- C 86 km
- D 89 km
- E 93 km

- 19** The following is from a report on road accidents in Scotland in 1998:

A total of 13,828 car users were injured in road accidents, representing 62% of all casualties. Of these people, a total of 2,386 were either fatally or seriously injured, 223 of whom died. Roads in built-up areas accounted for a little over half of all car-user casualties (53%: 7,389 out of 13,828). Presumably because average speeds are higher in non-built-up areas, they accounted for much higher percentages of the total numbers of car users who were fatally injured (84%: 187 out of 223) or were fatally or seriously injured (72%: 1,724 out of 2,386).

How many car users suffered serious, but not fatal, injuries in accidents on roads in Scotland in non-built-up areas in 1998?

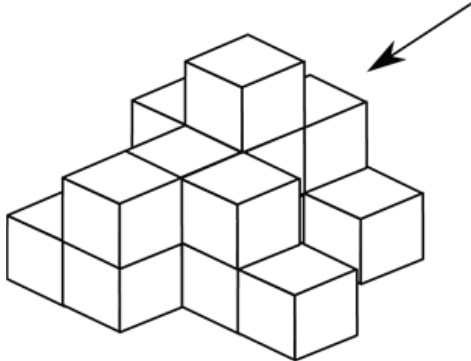
- A** 1,537
- B** 1,724
- C** 2,199
- D** 6,439
- E** 7,389



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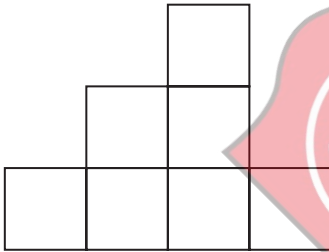
- 20** One of the exhibits in the Interactive Art Exhibition at the Hanson Gallery consists of 16 identical free-standing cubes. Visitors to the exhibition are invited to handle these cubes and rearrange them to create their own work of art.

This is the arrangement that I have made:

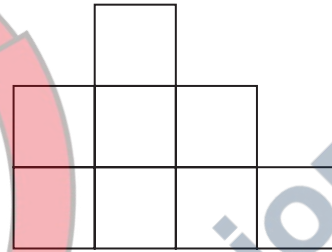


What is the side view of my arrangement from the direction indicated by the arrow?

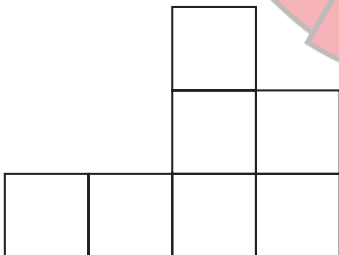
A



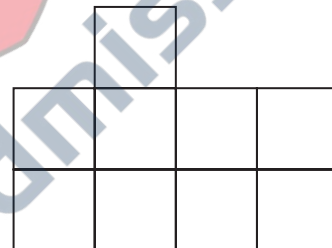
B



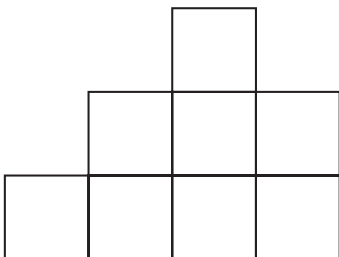
C



D



E



- 21** It is all very well for Europeans to expect African farmers and villagers to show the same enthusiasm for lion protection schemes as 'wildlife tourists' and armchair conservationists who deplore the killing or even the fencing-in of these noble and celebrated creatures. But it is estimated that the average farm in Tanzania loses the equivalent of £600 a year in livestock due to lions straying outside the boundaries of the national parks where they are protected and growing in numbers. When out hunting, lions do not respect the difference between another wild animal and a domesticated beast that is owned by someone and often of priceless value to that person. Most European countries would not tolerate the presence of huge, wild, man-eating cats roaming wild in the countryside, decimating their profits and killing their children. They have proved this by hunting many native species perceived as dangerous – wolves, bears, boar – to extinction, or by destroying their habitats. Why should Africa be different?

Which one of the following identifies a flaw in the above reasoning?

- A** The fact that other countries have failed to protect their wildlife heritage does not make it right.
- B** Farmers in the UK are strong advocates of the culling of badgers to protect cattle from TB.
- C** Many rural African communities are very poor and lions are a serious threat to their economic survival.
- D** Without protection lions would soon become an endangered species in the wild.
- E** Tourism has already suffered in Africa due to the scarcity of many large game animals.

- 22** This essay is of a far higher standard than can be expected of undergraduates. Either the student is exceptionally intelligent and knowledgeable, or she has copied the essay from the internet. Her previous essays have given no indication that she is more intelligent or knowledgeable than an average student. So she must be guilty of plagiarism.

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

- A** This manager has an extravagant lifestyle with expensive holidays, which leads me to suspect that he has been stealing money from the company.
- B** My partner has given me a lovely bouquet of flowers. He must be feeling guilty about something, because he only gives me flowers to celebrate special occasions or when he feels guilty, and this is not a special occasion.
- C** My teenage daughter has cooked dinner and washed up without being asked. She must want something.
- D** The Prime Minister has admitted that a member of the Cabinet has been taking bribes. Either he has his own reasons for getting rid of the colleague or he knows that the evidence is too strong for him to be able to deny it.
- E** The standard of this essay is below what we have come to expect of you. Perhaps the topic was especially difficult. The only other possible explanation is that you were not trying hard enough.

- 23** It is both morally and economically wrong for the Government to give implicit approval to an employment system that lands the state with a huge bill to top up the incomes of the lowest earners. The holes in millions of pay cheques are being plugged by in-work support to the tune of £4 bn a year. But why aren't those who are profiting from their workers paying up? Why is the Government having to subsidise businesses who don't pay their employees enough to live on? It is a question we need to answer and act on – fast. The cost of living is rising but wages are not. In the rush for profit, and for high pay at the top, too many companies have forgotten the basic moral imperative that employees be paid enough to live on.

Which one of the following is the best statement of the principle underlying the above argument?

- A** The Government is responsible for the employment system that leaves holes in millions of pay cheques.
- B** It is morally wrong of the Government to assist people on low incomes.
- C** High pay at the top end is responsible for low wages at the bottom end of the employment ladder.
- D** All pay should increase each year at the same rate as the cost of living.
- E** Every worker should be paid at least a living wage by those who profit from their work.

- 24** Last night I took part in a quiz night, and my team won first prize.
The quiz consisted of three rounds:

Round 1 was 20 easy questions worth 1 point each;

Round 2 was 20 medium questions worth 2 points each;

Round 3 was 20 hard questions worth 5 points each.

Our winning score was 138 points, having answered just nine questions incorrectly.

The runners-up were annoyed because they had fewer incorrect answers, but fortunately for us (although a little embarrassing) we had more incorrect answers in Round 1 (the easy questions) than in either of the other two rounds.

How many questions did we answer incorrectly in Round 1?

- A** 4
- B** 5
- C** 6
- D** 7
- E** 8

- 25** I need to buy new printer paper for my fax machine. The paper comes in rolls. My machine needs paper 210 mm wide and will take a roll up to 25.4 mm in diameter.

I do not really care how long the paper in the roll is and will buy rolls in bulk if they are cheaper. I will just buy the most economical paper to use. I cannot, however, afford to spend more than £30.00.

The prices in the catalogue are as follows:

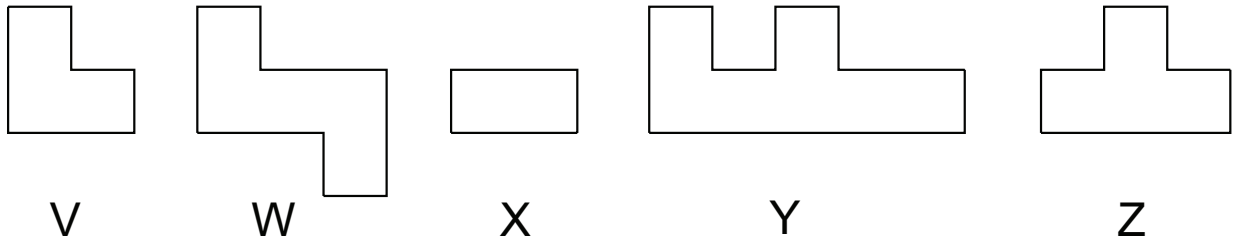
			Single rolls			Packs of 6 rolls		
Width (mm)	Length (m)	Diameter (mm)	RRP	Price	Saving	RRP	Price	Saving
216	100	25.4	£12.84	£7.99	38%	£77.04	£39.54	49%
210	25	12.7	£4.16	£2.49	40%	£24.96	£13.14	47%
210	100	25.4	£12.13	£7.49	38%	£72.78	£38.10	48%
210	100	50.8	£12.24	£7.59	38%	£73.44	£38.94	47%
210	50	25.4	£6.62	£4.19	37%	£39.72	£20.94	47%

(RRP=Recommended Retail Price)

How much will the transaction cost me?

- A** £2.49
- B** £4.16
- C** £7.49
- D** £20.94
- E** £24.96

- 26 After having some carpets fitted recently I was left with these five remnants.



I have stitched four of these pieces together to create a rectangular 'patchwork' mat whose length is twice its width.

Which one of the pieces is **not** part of my mat?

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

- 27 There is no point to re-enactments of historical battles. Despite the meticulous attention to getting the uniforms right and the cannon smoke, the simulation of being there fails on every level: there is no real danger of death and you know what the outcome will be. It is merely an exercise in pageantry. In history-as-lived, the participants at Gettysburg did not know that the Confederates were not going to win, while in a scripted re-enactment everyone knows their role and destiny from the outset.

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

- A Re-enactments of historic battles are just colourful pageants.
- B The simulation of being there at a re-enacted historic event fails on all levels.
- C Re-enactments of historic battles are pointless.
- D No insights into historic battles are gained through re-enactments.
- E Pageantry is of no value in itself.

- 28** Crazy as it seems, it looks as if lead poisoning could be the major cause of the rise and fall of violent crime. Lead is so toxic that it is unsafe at any level and in Europe it has been banned from many products, including paint and petrol, since the 1990s. Lead poisoning in infancy, even at very low levels, impairs the development of those parts of the brain that regulate behaviour and mood. The effect is stronger in boys than in girls. Lead poisoning is associated with attention deficit disorder, impulsiveness, aggression and, some think, psychopathy. Studies between cities, states and nations show that the rise and fall in violent crime follows, with a roughly 20-year lag, the rise and fall in the exposure of infants to trace quantities of lead. Virtually all studies agree there is a strong correlation.

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

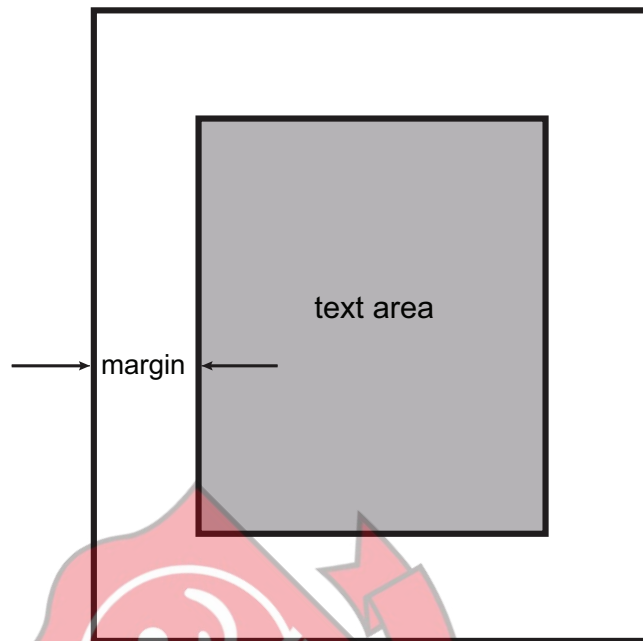
- A** European countries could soon expect to see a fall in levels of violent crime.
- B** Possible causes of violent crime such as poor social conditions and drugs can now be discounted.
- C** If lead in petrol and paint is banned worldwide, violent crime will become almost unknown.
- D** Countries with less commitment to safety standards will be reluctant to ban lead from products.
- E** Boys who are exposed to lead in infancy are highly likely to go on to commit violent crimes in their early twenties.

- 29** The number one reason for people changing their jobs is to escape from 'difficult people', followed by seeking higher pay and promotion. In particular, many people cite a poor relationship with their boss as a reason for leaving. Typically, they'll go to another job and find another difficult boss and the process continues. One of the areas that contributes to altercations with other people is the issue of unmet expectations. We easily see ourselves as being let down by the difficult person who fails to do what we expect them to. Very often these expectations are entirely in our own heads. We put the responsibility for knowing our expectations onto the difficult person and then blame them when they disappoint us. If only people worked towards having honest conversations with difficult people, staff turnover might decrease.

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

- A** Expectations of other people are always realistic.
- B** Difficult people are aware that they are difficult.
- C** People are not honest about their reasons for leaving a company.
- D** Staff turnover is damaging for a company.
- E** People cannot be trained to have honest conversations.

- 30** A company is producing a one-page flysheet 24 cm high by 18 cm wide. It will have a text area in the centre which has a margin of the same width all the way around. The text must occupy exactly half of the total area:



What is the width of the margin?

- A** 3.00 cm
- B** 4.50 cm
- C** 5.25 cm
- D** 6.00 cm
- E** 12.00 cm

- 31** Daria and her three friends are planning a trip to London to see a musical in the West End. Ticket prices vary according to the location of seats in the theatre. Monday to Friday, Balcony seats are £78.20 per person; seats in the Dress Circle cost £95.50 per person; seats in the Grand Circle £88.99 per person; and seats in the Orchestra Stalls £82.00 per person.

At the weekend (Saturday and Sunday), Balcony seats are £81.35 per person, seats in the Dress Circle cost £99.99 per person; seats in the Grand Circle £93.20 per person; and seats in the Orchestra Stalls £86.00 per person.

The theatre also sells Boxes which seat four people and cost £320.00 in total. A special offer of 15% off group booking for four or more people is available on seats in the Dress Circle.

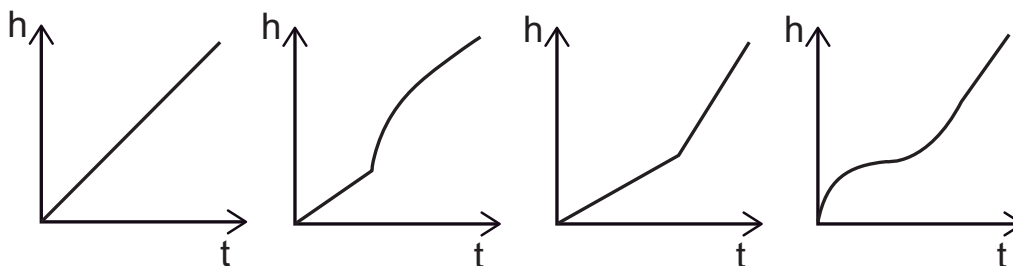
Daria and her friends decide that they want to sit together in the same part of the theatre. What is their cheapest option?

- A** Balcony
- B** Box
- C** Dress Circle
- D** Grand Circle
- E** Orchestra Stalls



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- 32 Water was poured into five containers at a steady rate until each was full. A graph of the depth of water (h) in the container against time (t) was sketched for each container. One of the graphs has been lost.



Which one of the following containers is **not** represented by any of the above graphs?

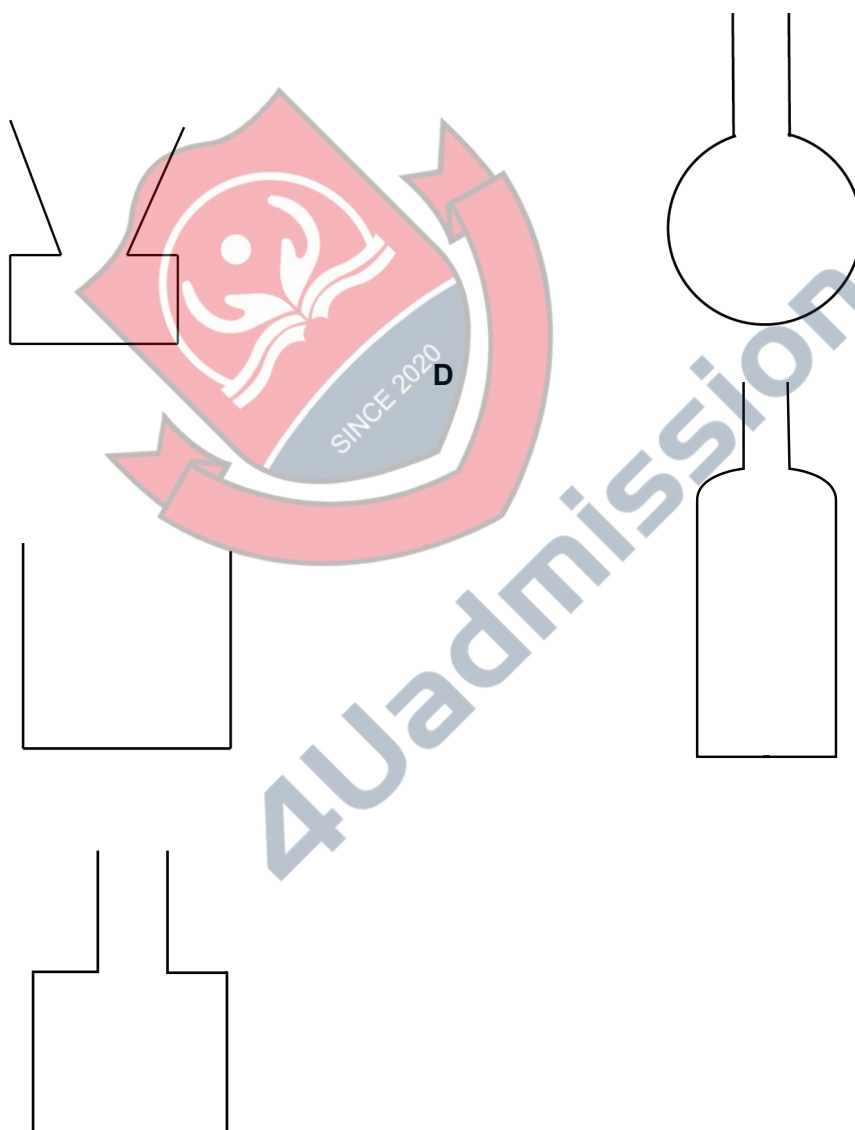
A

B

C

D

E



- 33** Some public institutions, such as the central bank and the constitutional court in many countries, are nominally independent but are actually captive to political interests. Their leading officials are appointed by the government and these appointments are always the result of political power games. Moreover, it is fundamentally undemocratic to delegate too much power to people who have not been popularly elected. Therefore, in order to ensure the real independence and the democratic nature of these institutions, the most prominent public officials should be elected in general elections.

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

- A** Once appointed, the holders of independent public offices pursue strategies inconsistent with the political goals of those who appointed them.
- B** Opinion polls show that people are not interested in electing public officials leading independent institutions.
- C** A politician vouches for the independence of a candidate to the head of the central bank.
- D** A former judge of the constitutional court was recently jailed for electoral fraud.
- E** Heads of central banks often have strong connections to political parties.

- 34** When it comes to genius, the only possibilities are that it is something innate in people, or it is something to do with their upbringing. It is hard to imagine how simply bringing someone up in a certain way would be enough to turn them into a Mozart or a Shakespeare or an Einstein. Mozart after all was writing complex music as a young child; it is difficult to explain how environment could have had such a significant influence by the age of five. It must therefore be the case that genius is something that is wholly innate.

Which one of the following is the best statement of the flaw in the above argument?

- A** It assumes that genius has to be evident at an early age.
- B** It is impossible to draw conclusions about questions of nature and nurture with such certainty.
- C** Just because genius cannot be wholly explained by upbringing, this does not mean that upbringing is not an important factor.
- D** The argument does not specify exactly what is meant by 'genius'.
- E** The fact that something is hard to imagine does not mean that it is not true.

- 35** The government's decision to withdraw housing benefit from those living in council accommodation which has a spare bedroom has been a complete failure. It has failed to bring in sufficient savings to the government and has brought hardship to those affected by the cut. The government should focus less on punishing certain people to make savings and more on implementing affordable universal childcare, which would allow many more people into the workplace and able to pay taxes.

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

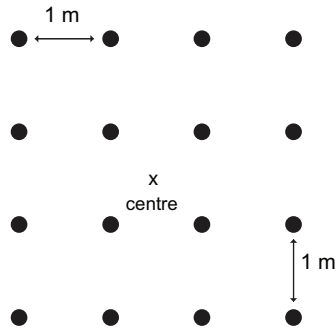
- A** The housing benefit cut affects vulnerable people.
- B** The government should implement a policy affecting more people.
- C** The housing benefit cut only tackles a few people.
- D** The government should target policy on providing universal childcare.
- E** Implementing childcare would be a better way of generating money.

- 36** The payment systems which use pre-paid magnetic swipe cards are not all that wonderful. We had one put into the office last week to operate the tea and coffee dispensing machine. I was somewhat surprised to find, after having five coffees, that I had spent 121 p, and my colleague, after four teas, had spent 82 p. We were assured that there had been no changes in the prices; the problem appears to be that if you ask the machine how much you have left, it deducts a 'service' charge for this 'service'. We both enquired once. Charges for tea, coffee and service are whole numbers.

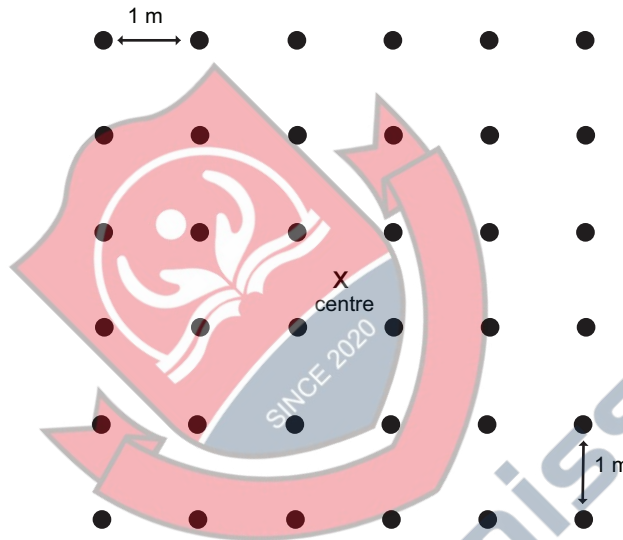
What is the minimum that the service charge could be?

- A** 1 p
- B** 2 p
- C** 4 p
- D** 6 p
- E** 14 p

- 37 I have a square field which is exactly one hectare ($100\text{ m} \times 100\text{ m}$). On Monday I was surprised to find 4 mushrooms growing in a 1 m square formation, in the centre of my field. On Tuesday the group of mushrooms had expanded to 16, which were all 1 m apart.



When I looked at the group of mushrooms today (Wednesday), it had expanded to 36.



If the area covered by mushrooms continues to expand at this rate, how many days (including today) will it be until my field is covered in mushrooms?

- A 48
- B 50
- C 96
- D 100
- E 192

- 38** Bob, Eve, Nan, Pip and Viv took part in a 6-hour sponsored bowling marathon to raise money for charity. They were all sponsored per complete 100 points scored.

Bob was sponsored for a total of £63 per 100 points.

Eve was sponsored for a total of £56 per 100 points.

Nan was sponsored for a total of £72 per 100 points.

Pip was sponsored for a total of £54 per 100 points.

Viv was sponsored for a total of £68 per 100 points.

During the 6-hour marathon:

Pip scored 2,835 points.

Eve scored 2,782 points.

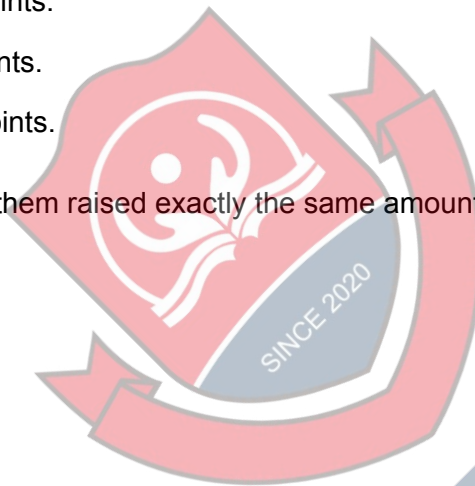
Bob scored 2,407 points.

Viv scored 2,293 points.

Nan scored 2,169 points.

Remarkably, four of them raised exactly the same amount. Who raised a different amount to the other four?

- A** Bob
- B** Eve
- C** Nan
- D** Pip
- E** Viv



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- 39** Hospital food isn't a joke. It's a scandal. The list of meal options is ever longer, but there is nothing there that you would ever want to eat and nothing freshly cooked. These aren't trivial issues. Because of this, over the past year people of all ages, but particularly the old, have faded away from lack of food. Despite being urged to eat, many simply won't. Making sure patients who try to eat are actually nourished adequately is another problem. These days you need to be well-nourished before you enter hospital if you want to survive!

Which one of the following is a conclusion that can be drawn from the above argument?

- A** Better systems should be put into place to ensure patients eat.
- B** Hospitals should increase the number of nurses per patient.
- C** Hospital food should be supplemented with nutritional supplements specific to each patient.
- D** Hospital food should be made more appealing and nutritious.
- E** There should be more checks on patients' state of nourishment.

- 40** Political legitimacy, the moral right to use state power, can only be derived from the consent of the governed. So, in democracies that uphold this principle, regular elections are held to ensure that political power is legitimate. Therefore, in these cases, the more voters participate in elections, the more legitimate the democratic political system is.

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

- A** Electoral turnout is always higher in democratic political systems.
- B** Voting at elections implies consent to the political system as a whole.
- C** There is always a need for a government.
- D** The more people who vote, the more the common interests are met.
- E** Non-democratic political systems rely on coercion as a basis of state power.

- 41** High street stores should not be able to sell financial products, because consumers should not be misled into buying products they may not need by staff who do not understand what they are selling. Financial products require an understanding of financial services, and very few high street retailers have members of staff in store who can fully explain the benefits and disadvantages of the financial products being sold.

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

- A** Many high street stores have been fined by the financial regulator for mis-selling financial products.
- B** Many stores offer incentives to customers to encourage them to sign up for store cards.
- C** Consumers are supplied with full details of the terms and conditions for all financial products that they sign up for.
- D** Many people do not understand the financial products they purchase yet still benefit from them.
- E** Most people do not read the terms and conditions of products and services that they sign up to.

- 42** Anna buys potatoes in the local market. She has noticed that the price on Saturday morning is 5 p per kilo more than the normal weekday price. However, an hour before the stall closes on a Saturday afternoon, the price drops to 5 p per kilo below the weekday price. She spends £3.00 a week on potatoes. This will buy her 3 kilos less in weight on a Saturday morning than on a weekday, but 5 kilos more in weight at the low Saturday afternoon price than on a weekday.

What is the weekday price of potatoes per kilo?

- A** 12 p
- B** 15 p
- C** 20 p
- D** 25 p
- E** 30 p

- 43** Mike wants to buy a second-hand car that offers the lowest depreciation per mile. He is not worried about the model. His family insist that the car has 4 or 5 doors and an engine of at least 1.6 litres so that it can tow a caravan. Mike plans to keep the car until it has covered 100 000 miles and then sell it for £1,000. He scans the following price list from his local garage:

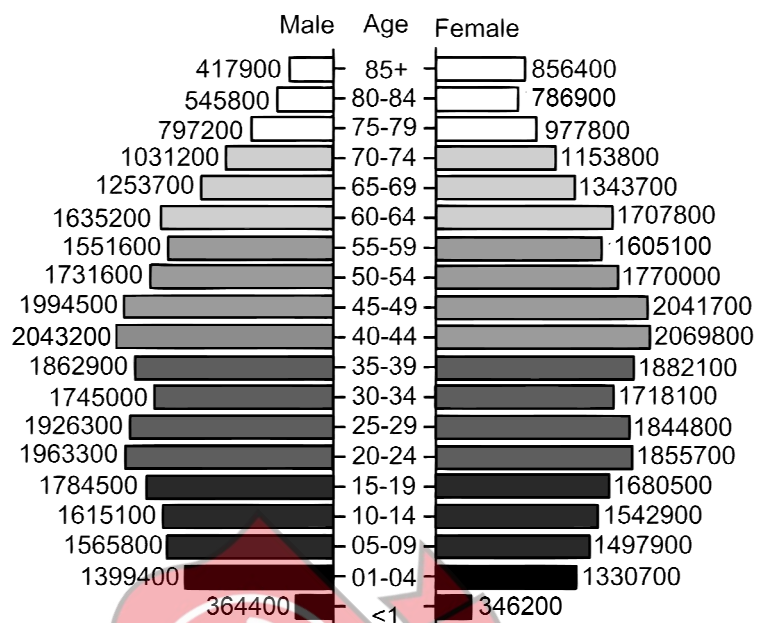
Make	Model	Engine	Mileage	Price
Ford	Escort 3 door	1.6 litre	70 000	£2,500
Rover	214 SLi 3 door	1.4 litre	30 000	£4,500
Rover	414 Si 4 door	1.4 litre	40 000	£4,500
VW	Golf CL 3 door	1.6 litre	95 000	£1,200
Rover	820 4 door	1.6 litre	30 000	£7,000
Vauxhall	Vectra 3 door	1.8 litre	10 000	£8,000
Vauxhall	Astra 3 door	1.4 litre	50 000	£3,500
Ford	Escort 5 door	1.4 litre	40 000	£4,000
Renault	Clio 3 door	1.6 litre	80 000	£2,000
Renault	Laguna 5 door	1.8 litre	20 000	£7,000
Rover	825 4 door	2.5 litre	90 000	£1,500
Ford	Sierra 4 door	2.0 litre	70 000	£2,000

Which make of car does Mike buy?

- A** Ford
- B** Rover
- C** VW
- D** Vauxhall
- E** Renault

- 44 The population pyramid below shows the age and gender distribution of the residents in England and Wales in 2010.

England and Wales Population 2010



Which one of the following statements is not true?

- A Over the age of 34, the number of women is higher than that of men for every age group.
- B Below the age of 35, the number of men is higher than that of women in every age group.
- C There are more than twice as many women as men in the 85+ age group.
- D Not taking children below the age of 1 into consideration, the least numerous age group is that of people aged 80 to 84.
- E The most numerous age group consists of people aged between 40 and 44.

- 45** Many people criticise what they call 'the younger generation' for what their seniors regard as immoral behaviour. These critics need to realise that because the world has changed, moral standards have changed with it. In fact, technology is advancing so rapidly that it is only the young who understand the world in which they live. It is they, not their parents or grandparents, who should be setting moral standards. Anyone over the age of 25 cannot help but be blinded by what they learned in the past. Their education has prevented them from perceiving and responding to the demands of the modern day, and so their moral judgments have no validity.

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

- A** Moral judgments made by people over the age of 25 are not valid.
- B** Moral standards have changed.
- C** Moral standards should be set by people under the age of 25.
- D** The younger generation is guilty of what older people regard as immoral behaviour.
- E** Young people are the only ones who understand the contemporary world.

- 46** In order for it to be possible to rain, clouds must be present. The weather forecast is predicting clear skies, so there is no chance of rain.

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

- A** The temperature in the fish tank must be at least 25°C for the fish to survive. The fish are all alive, therefore the temperature must be at least 25°C.
- B** Solar eclipses only occur at New Moon, when the Moon is between the Earth and the Sun. The new moon is not until next week, so there will be no Solar eclipse today.
- C** A scab will only form when platelets in the blood have clotted. If you do not have any scabs, you do not have platelets in your blood.
- D** When outside temperatures fall below 0°C household pipes are at risk of bursting. So at a temperature of -5°C all your household pipes will burst.
- E** Deciduous trees lose their leaves in the autumn. Autumn will be late this year, so trees will not lose their leaves until winter.

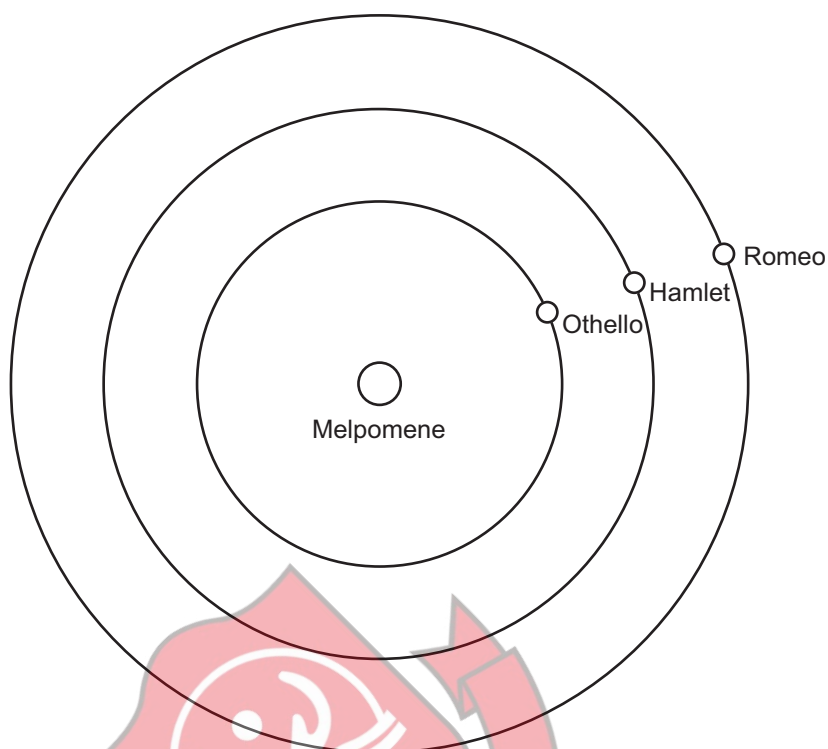
- 47** It is time for prostitution to be legalised. It has been illegal for millennia, and yet it is still present in modern society. Clearly, its being illegal does not provide enough deterrent to prevent people from engaging in it. We are never going to eradicate prostitution, so we should give up trying, and legalise it. Money that is spent in prosecuting prostitutes and their clients could be better used elsewhere.

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

- A** Prostitutes' clients should be prosecuted, but not prostitutes themselves.
- B** Some people will commit murders, whether or not murder is illegal, so murder should not be illegal.
- C** People who are involved with dealing in illegal substances largely as a result of a background of poverty should not be prosecuted.
- D** Modern crimes, such as internet hacking, should be the focus of police forces.
- E** We should not waste money trying to rehabilitate young offenders.



- 48 The planet Melpomene has three moons, Othello, Hamlet and Romeo, each moving at a constant speed in the same direction in circular orbits.



Othello takes 20 days to complete one orbit of Melpomene, whereas Hamlet takes 45 days and Romeo takes 120 days.

How often are Melpomene and all three of its moons in line with each other in the order shown in the diagram?

- A every 36 days
- B every 72 days
- C every 132 days
- D every 180 days
- E every 216 days

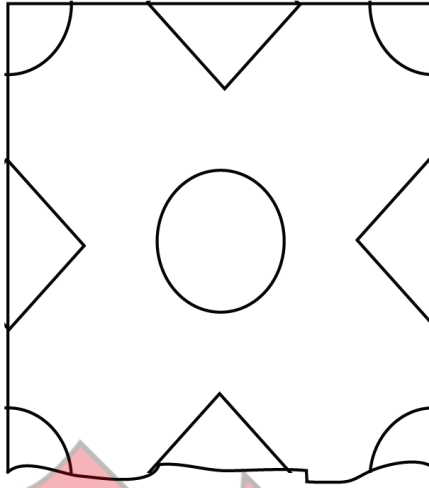
- 49** One of the options available to purchasers of furniture from Home Help Superstore is to hire one of the store's self-drive delivery vans. They have four models, with different capacities, which can be hired for either 4 hours or 1 day.

Capacity of Van	Duration of Hire	Basic Price	Price per Extra Mile
3 m ³	4 hours (40 miles included)	£33	20 p
3 m ³	1 day (120 miles included)	£41	20 p
8 m ³	4 hours (40 miles included)	£42	25 p
8 m ³	1 day (120 miles included)	£54	25 p
12 m ³	4 hours (40 miles included)	£47	30 p
12 m ³	1 day (120 miles included)	£63	30 p
20 m ³	4 hours (40 miles included)	£52	35 p
20 m ³	1 day (120 miles included)	£70	35 p

What is the minimum distance for which it is cheaper to hire a 12 m³ van for a whole day, even if it could be returned within 4 hours?

- A** 64 miles
- B** 72 miles
- C** 89 miles
- D** 92 miles
- E** 94 miles

- 50** Rolls of a particular wallpaper have a repeating pattern every 60 cm of their length. Each roll is 10 m long and 50 cm wide. A wall 2.5 m high and 6.2 m wide is to be papered from ceiling to floor with single lengths of paper hung vertically (drops).



How many rolls of wallpaper will be needed so that the pattern on each drop matches the next? (No joins can be made in one vertical drop.)

- A** 3
- B** 4
- C** 5
- D** 6
- E** 7

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