



What it assesses

- Problem-solving skills (includes numerical and spatial reasoning)
- Critical thinking skills (includes understanding arguments and reasoning, using everyday language)

Question types

- 40 MCQs, consisting of:
 - 20 problem-solving questions
 - 20 critical thinking questions

Duration

- 90 minutes

How to prepare

- Designed to be taken with minimal preparation (a sample paper/model test has been uploaded on the website)

The Ashoka Aptitude Assessment is mandatory for all applicants and a part of the application process.

Applicants are assessed on both academic and non-academic parameters within the round in which they apply. Within the academic parameters, since most applicants only submit their predicted scores/grades, the Ashoka Aptitude Assessment provides the Office of Admissions the ability to further assess all applicants in a more holistic manner. For those who are shortlisted for the interview, in the absence of their final class/grade XII scores, chances of getting a confirmed offer are higher with the inputs from the Ashoka Aptitude Assessment alongside their performance in all other parameters.

Ashoka Aptitude Assessment: Sample Questions with Solutions

- 1 You are allowed to vote in the general election only if you are at least 18 years old. You have reached 18 so you will be able to vote in the forthcoming election.

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

- A** You cannot obtain foreign currency from this bank if you cannot produce acceptable identification. You cannot produce the required identification, therefore we cannot let you have the foreign currency.
- B** You can visit your grandmother in hospital providing you have no illness yourself. As you have no illness, you will be able to visit your grandmother.
- C** We can afford to go to America this year only if you save up sufficient money. You haven't saved enough so we will not be able to go.
- D** To win the jackpot prize in the national lottery you need a ticket with all six prize-winning numbers. When I heard you had won the jackpot, I knew you had the lucky ticket that matched all the numbers from the draw.
- E** Passport applications can only be accepted if photographs are witnessed as a likeness by someone in a professional job. Your application was refused so your witness cannot have been a professional person.

The passage and option **B** share the same underlying structure: P is necessary for Q; P is true; therefore Q must be true.

In the passage: P = 'You are 18 years old' and Q = 'You can vote in the general election'.
In option **B**: P = 'You are not ill' and Q = 'You can visit your grandmother in hospital'.

Option **A** has the underlying structure: P is necessary for Q; P is not true; therefore Q is not true.
P = 'You can produce acceptable identification' and Q = 'You can obtain foreign currency'.

Option **C** has the underlying structure: P is necessary for Q; P is not true; therefore Q is not true.
P = 'You have saved up sufficient money' and Q = 'We can go to America this year'.

Option **D** has the underlying structure: P is necessary for Q; Q is true; therefore P must be true.
P = 'You have a ticket with all six prize-winning numbers' and Q = 'You win/won the jackpot in the lottery'.

Option **E** has the underlying structure: P is necessary for Q; Q is not true; therefore P is not true.
P = 'Photograph is witnessed as a likeness by someone in a professional job' and Q = 'A passport application is accepted'.

- 2 The Pentarathon Challenge is a competition in which five athletes compete against each other in five marathon races, run on consecutive days.

Points are awarded in each race, as follows:

first place 7 points

second place 5 points

third place 3 points

fourth place 2 points

fifth place 1 point

This table shows the total points of the competitors in this year's Pentarathon Challenge after each race.

<i>name</i>	<i>total points after race 1</i>	<i>total points after race 2</i>	<i>total points after race 3</i>	<i>total points after race 4</i>	<i>total points after race 5</i>
Colin	7	9	10	12	17
Jason	1	4	6	13	14
Kyle	3	10	15	18	25
Noel	2	7	14	15	18
Ray	5	6	9	14	16

Who finished in a different position in each of the five races?

- A Colin
- B Jason
- C Kyle
- D Noel
- E Ray

There is a lot of data here, but all you need to consider is that a different position in each of the five races will result in a total score of $7 + 5 + 3 + 2 + 1 = 18$ points. Only Noel has this total after race 5. The totals after each of the first four races are unnecessary information (unless you wish to reassure yourself that Noel's points are indeed different in each race). The correct answer is option **D**.

- 3 Microscopic malaria parasites enter a person's bloodstream through mosquito bites and infect red blood cells. They replicate in these cells and penetrate other organs. Until recently, microbiologists sought to block the parasites from entering red blood cells. Rhode Island University studied 700 Tanzanian children infected with malaria and found the parasites use a protein, since named PfSEA-1, to escape from the red blood cells they infect. Having investigated a subgroup of children immune to malaria, the researchers realised these children were producing an antibody that locked protein PfSEA-1 into their red blood cells. Trapped in the red cells, the parasites were destroyed by immune system cells. Scientists have reproduced the antibody and successfully tested it on mice. Experts believe that, after trials, the antibody will be certified for use in the treatment of humans.

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

- A Rhode Island University is a world leader in medical research.
- B After the discovery of protein PfSEA-1, the traditional approaches to fight malaria will be abandoned as ineffective.
- C The discovery of protein PfSEA-1 is likely to help scientists to develop a new way of combatting malaria.
- D World leaders should support and fund the research being conducted by Rhode Island University.
- E A unique feature of the Tanzanian children helped in the discovery of protein PfSEA-1 and its function in spreading malaria.

The passage describes a new method for preventing the replication of malaria parasites in red blood cells. The PfSEA-1 protein prevents malaria parasites from escaping from the blood cells they penetrate and they are subsequently eliminated by the immune system. Researchers discovered that a group of children immune to malaria had an antibody that prevented malaria parasites from accessing the PfSEA-1 protein.

From this information we can draw option **C** as a conclusion. If it's true (and sentences 4 and 5 tell us this) that the antibody limits malaria parasites' access to a crucial protein, then the ability to reproduce the antibody in a form that could be given to patients promises a treatment against malaria.

We cannot draw option **A** as a conclusion because although Rhode Island University carried out the promising research, it doesn't follow that the institution is necessarily a world leader in medical research.

We cannot draw option **B** as a conclusion because the development of a new treatment for malaria does not mean doctors will automatically abandon existing therapies.

We cannot draw option **D** as a conclusion because the passage does not make any specific claims about what world leaders ought to support and fund. This option goes beyond the factual information in the passage without support.

We cannot draw option **E** as a conclusion because the passage does not provide further information about whether what was found in the blood cells of the immune Tanzanian children was unusual or not.

- 4 A builder has 32 kg of a mix of sand and cement, of which 25% is sand. For a new job, he needs 120 kg of a mix of sand and cement in which the ratio of sand to cement is 2 : 1. To obtain this, he starts with his initial 32 kg mix and adds more sand and cement.

What is the ratio of the masses of sand and cement that he needs to add?

- A 4 : 7
- B 3 : 4
- C 5 : 3
- D 9 : 2
- E 12 : 1

The builder has 32 kg of a mix made up of 8 kg of sand (25%) and therefore 24 kg of cement. He needs his final mix to be 120 kg, made up of 80 kg of sand and 40 kg of cement (2 : 1 ratio). This means that he needs to add 72 kg of sand and 16 kg of cement to his original mix. This is a ratio of 72 : 16, which, in simplest terms, is 9 : 2. The correct answer is option **D**.

- 5 I am planning to buy a new laptop. The following table shows the specifications and the prices of my shortlist.

<i>laptop</i>	<i>processor speed (GHz)</i>	<i>memory (GB)</i>	<i>storage (GB)</i>	<i>graphics card memory (GB)</i>	<i>screen size (inches)</i>	<i>price (£)</i>
<i>Racer</i>	2.7	4	500	2	15.6	600
<i>Ledd</i>	2.8	8	1000	4	17.3	850
<i>SNSV</i>	2.5	4	750	6	15.6	500
<i>Pear</i>	2.8	8	1000	4	13.3	1300
<i>Elovon</i>	3.0	16	1000	8	15.6	700

In terms of storage, the operating system and my files take up 300 GB. I would also like a laptop with a screen size of at least 15 inches. I am looking for the cheapest laptop that can run the following games (the minimum system requirements indicate the lowest possible value for each characteristic that would enable me to play these games):

MINIMUM SYSTEM REQUIREMENTS OF GAMES				
<i>game</i>	<i>processor speed (GHz)</i>	<i>memory (GB)</i>	<i>storage (GB)</i>	<i>graphics card memory (GB)</i>
<i>OTAD</i>	2.7	6	70	4
<i>Kickman</i>	2.5	4	80	4
<i>Earthcraft</i>	2.2	4	50	2
<i>Near Scream</i>	2.6	8	100	4

Which laptop should I buy?

- A Racer
- B Ledd
- C SNSV
- D Pear
- E Elovon

The most efficient approach to this question is to eliminate the laptops that don't satisfy the essential requirements and then select the cheapest of those you have not eliminated.

Racer does not have enough memory or graphics card memory to run all of the games.
SNSV has a processor speed that is too low to run all of the games as well as not enough memory.
Pear has a screen size that is too small.
Elovon is the cheaper of the other two laptops.

The correct answer is option **E**.

- 6 A combination lock has three dials, each dial has eight letters. It is known that the following combinations have been used - one, who, two, bob, add, owl, fab, den, mia and tat.

Which one of the following words is not possible to use on this combination lock?

- A win
- B deb
- C hat
- D men
- E bad

From the combinations that have been used, you can establish that the first dial contains the eight letters o, w, t, b, a, f, d, and m. There is no h, so it cannot be possible to use 'hat' as a combination.

It is not necessary to consider the second and third dials, though it can be confirmed from the combinations used that the other four words are possible. The correct answer is option **C**.

- 7 Sometimes we are mistreated by others, and forgiveness is one kind of response to those who wrong us. However, sometimes we do things that appear to be morally wrong but, in fact, are not. If we are reproached, we can give an explanation for our action that justifies it. In these cases, we are claiming that, despite appearances to the contrary, what we did was morally permissible. Forgiveness and justification ought to be distinguished. When conduct is justified, the implication is that it was not morally wrong, but when conduct is forgiven, there is no such implication. What we are forgiven for is the morally wrong things we do.

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

- A Sometimes we do things that appear to be morally wrong but, in fact, are not.
- B Forgiveness and justification ought to be distinguished.
- C What we are forgiven for is the morally wrong things we do.
- D Forgiveness is one kind of response to those who wrong us.
- E When conduct is justified, the implication is that it was not morally wrong.

The main conclusion of the argument is that forgiveness should be distinguished from justification.

The reasoning that supports this conclusion is:

- 1 Forgiveness and justification are responses to actions.
- 2 Forgiveness implies that an action was wrong.
- 3 If an action is justified then it is not wrong.
- 4 Sometimes a justified action appears to be wrong.

Option **B** states the main conclusion.

Option **A** expresses reason 4.

Option **C** expresses reason 2.

Option **D** expresses part of reason 1.

Option **E** expresses reason 3.

- 8 Every week I buy 12 cans of lemonade. The shop that I always buy them from sells individual cans for 80p each and packs of 4 cans for £2.60, so I buy three packs of cans.

Last week the shop had a special offer, as follows:

Individual cans – buy one, get another half price

Pack of 4 cans – buy one pack, get a 5th can free

I didn't want more than 12 cans, and I managed to get 12 cans for the lowest possible total price.

How much less than usual did I pay for my 12 cans last week?

- A 20p
- B 60p
- C 80p
- D £1.00
- E £1.40

I usually pay $3 \times £2.60 = £7.80$ for my 12 cans.

I bought exactly 12 cans last week, so it seems likely that I bought two packs of 4 +1 and 1 can + another half price. The cost of this = $(2 \times £2.60) + 80p + 40p = £6.40$, which is £1.40 less than usual. The correct answer is option **E**.

Another possibility would be 6 individual cans + another 6 half price, but this would cost $6 \times £1.20 = £7.20$, which is only 60p less than usual.

- 9 Despite the government's promise to be more business friendly, plans have been announced to change the law regarding the paid leave that couples are entitled to take following the birth of a child. This will allow new parents to take more time off work than under the current regulations. It is claimed that the current legislation makes it difficult for those with family commitments to manage all of their responsibilities, but it needs to be recognised that businesses (and in particular small businesses) need to operate in a way that guarantees that staff are available to do the jobs that need doing. The new proposals are undoubtedly going to make the system more complicated and could dissuade businesses from employing certain groups of people. They should be opposed.

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

- A The example given is only one of a range of measures being proposed.
- B Many businesses now allow their employees to choose to work from home.
- C The proposals from the government provide support for businesses to help with the cost of covering the work of staff taking leave.
- D The problems associated with covering the work of absent members of staff become increasingly difficult the longer the absence goes on.
- E The proposals will increase the amount of leave that employees are allowed to take in other circumstances as well as following the birth of a child.

The main conclusion of the argument is that new proposals to increase the entitlement to paid leave following the birth of a child should be opposed. The basis for this conclusion is that certainty around staffing is necessary for businesses to operate. Since the proposal would extend leave for new parents, the author draws the intermediate conclusion that the change would make staffing more complicated and might lead to discriminatory recruitment practices.

Option **C** weakens the inference to the intermediate conclusion: if the proposal includes support from government to help with covering leave, the negative effects on businesses are not inevitable.

Option **A** does not weaken the argument because it is focused on the effect of extending parental leave and not on any of the other measures being proposed.

Option **B** does not weaken the argument because the issue is not where employees are working, but whether businesses have staff available to do the work at all.

Option **D** has the potential to strengthen the argument: if the negative effect of leave increases with its duration, the proposed extension of parental leave may be more problematic than the existing arrangements.

Option **E** provides a further reason to reject the plans. The threat to business certainty may be greater if employees are entitled to take leave in a broader range of circumstances than at present.

- 10** Campaigners have long been calling for a change in the law to force social media companies to take racist, sexist, terrorist, or obscene material posted on their platforms more seriously. They want the government to bind Facebook, Google, etc. to the same strict rules that apply to newspapers and magazines. But that would be wrong. The proprietors of newspapers and magazines are classified as ‘publishers’, and all publishers are responsible for the content that is printed or displayed on their pages, whoever has contributed it. But the operators of social media platforms are not publishers in the proper sense of the word, and therefore they are not accountable for what individuals post on their platforms.

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

- A** The fact that social media operators are not classified as publishers does not mean they cannot have some of the same responsibilities.
- B** The fact that the government wants to bind the media giants to strict rules is not a reason to conclude that they will be successful.
- C** The fact that communication platforms have not been subject to the same standards as publishers in the past does not mean that they will continue to be so in the future.
- D** The fact that newspaper and magazine proprietors are classified as publishers does not make it right to hold them responsible for what their contributors write.
- E** The fact that Facebook and Google do not take their responsibility seriously does not necessarily apply to all social media providers.

The main conclusion of the argument is that it would be wrong to apply the same rules to social media platforms that are applied to magazine and newspaper publishers. The basis for this conclusion is that owners of newspapers and magazines are classified as publishers who are responsible for what they print. But since social media companies are not classified as publishers, they are not accountable for what people post on their site.

But just because publishers have a set of responsibilities, it does not follow that only publishers have such responsibilities. Option **A** expresses this erroneous step in the argument.

Option **B** misses the point of the argument, which is about whether social media companies are responsible for their content and not about whether they can be successfully held to account.

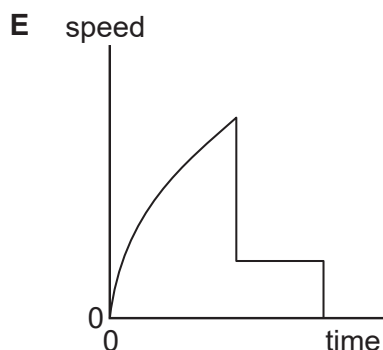
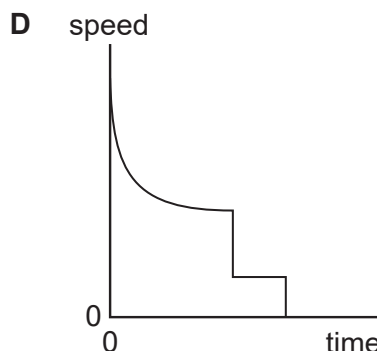
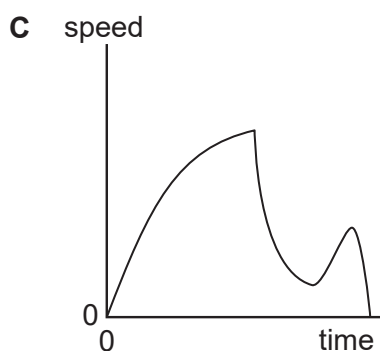
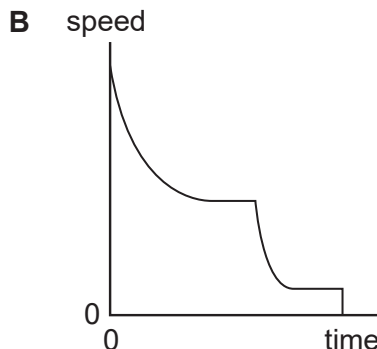
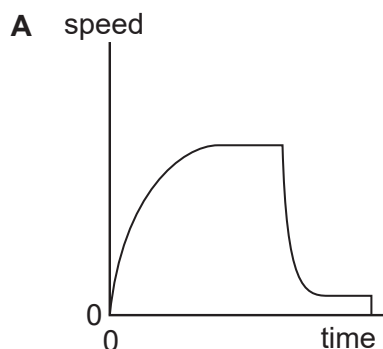
Option **C** does not identify a flaw because the argument does not involve an inference from how things have been to how they will be in the future.

Option **D** does not identify a flaw and merely questions the legitimacy of holding newspaper owners responsible for what they print.

Option **E** does not identify a flaw because the campaign is based on offensive material having been published at all, which does not involve a generalisation from particular cases to widespread occurrence.

- 11 When a sky diver leaves the aircraft, he falls faster and faster until he reaches a maximum steady speed known as terminal velocity. He falls at this speed until the parachute opens. The parachute slows him down until a much smaller steady speed is reached. This speed remains constant until the diver touches the ground.

Which of these graphs could show this information?



This question requires you to identify the speed/time graph that matches the detailed description of a sky diver's progress after leaving the aircraft. Reading through the question, we are told that the sky diver accelerates up to a constant speed (terminal velocity), after some time his parachute opens so he slows down to a smaller steady speed, and he remains constant at that speed until he touches the ground and stops.

B and **D** both have the appearance of falling. However, being graphs of speed/time, they represent something that is initially slowing down, not speeding up, and so can be eliminated.

C can be eliminated, because at no point after the parachute opens does the sky diver's speed increase.

E can be eliminated, because it shows an instantaneous change from the maximum steady speed to the much smaller steady speed.

A shows an initial increase in speed that levels off to a maximum steady speed, followed by slowing down to a much smaller steady speed and finally coming to rest. The correct answer is **A**.

- 12** The motor-car, that at first brought such freedom of private travel, has become a monster that is damaging our cities. The motor-car used to be affordable only by the rich, but there are now 21 million cars in this country, and the number is still rising steeply. The huge number of cars in city centres has produced intolerable congestion and pollution. We have reached the stage where the use of private cars must be curbed. Otherwise, we will see a worsening of the current situation, where it is already becoming quicker to walk through a city in the rush hour than to drive through it.

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

- A** The motor car no longer gives us freedom of travel.
- B** Increasing provision of public transport would solve traffic problems in city centres.
- C** It is necessary to limit the use of motor cars by private individuals.
- D** Pollution and congestion are damaging our city centres.
- E** The number of people who can afford to own a motor-car has risen, and is continuing to rise.

In this argument, the word 'must' appears in the fourth sentence. Is this sentence a recommendation that is supported by other statements in the passage? The first sentence claims that the motor-car has become a monster that is damaging our cities, and sentences two and three explain the sense in which the car is a monster, i.e. that the number of cars has hugely increased, causing intolerable pollution and congestion. These claims provide good reasons for stating that something should be done about the problem, but not necessarily for a conclusion that we must curb the use of private cars. The word 'otherwise' in the final sentence implies that if the action recommended in the previous sentence is not done, the problem will get worse. Thus the final sentence gives an additional reason for the conclusion that the use of private cars must be curbed.

We could summarise this argument as follows: the huge increase in the use of private cars has caused intolerable congestion and pollution; unless we limit the use of private cars, this problem will become even worse; therefore we should limit the use of private cars.

C expresses this claim; **A** is not stated in the passage; **B** suggests a solution that is not offered in the passage; **D** and **E** are reasons for the recommendation that is expressed in the main conclusion.

- 13** Lenton Cars hire out cars at a cost of £50.00 per day if the number of miles travelled is less than 80. There is an extra charge of £1.00 for every mile travelled over 80 miles. Dunford Hire charge £60.00 per day for taking the car out and then 50 p for every mile travelled.

For how many miles travelled would the cost of hiring a car be the same for both hire companies?

- A** 100
- B** 130
- C** 140
- D** 170
- E** 180

This question requires you to devise a procedure in order to solve it.

One possibility would be to calculate the cost of hiring a car from both companies for each of the mileages given as options A, B, C, D and E. However, this could be somewhat time consuming, and it is not necessary to know the total cost, only the mileage for which both companies would charge the same.

A more efficient approach is to appreciate that for 80 miles travelled, there is a difference of £50.00 between the cost of hiring from Lenton Cars and Dunford Hire. This is because Lenton Cars would charge £50.00, whereas Dunford Hire would charge $£60.00 + 80 \times 50p = £100$. For every further mile travelled, Lenton Cars charges £1.00, whereas Dunford Hire charges 50p, so the difference in the total cost reduces by 50p, until both companies cost the same for 180 miles ($80 + £50.00 \div 50p$).

The correct answer is **E**.

- 14** According to a recent survey, people believe that about a quarter of the population will become victims of a violent crime in the next year, whereas crime statistics show that it is only about 1 per cent. Furthermore, those with the greatest fear of crime are the least likely to be affected. The elderly are the most fearful, although victims are most likely to be young males. Over the last few years there has been an increase in the number of television programmes which show re-enactments of crimes. Though they are often done with the best of motives, these re-enactments add to people's fears about violent crime by making it look more common than it is. It is time that we stopped making such programmes.

Which of the following, if true, would most weaken the above argument?

- A** Crime re-enactments are made to look more realistic than they used to be.
- B** Most elderly people are unaware of the statistics of violent crime.
- C** Some types of violent crime have declined over the last few years.
- D** The elderly are the group least likely to watch crime re-enactments on television.
- E** Attempts have been made to ensure that statistics of violent crime are accurate.

The argument concludes that it is time to stop making programmes that show re-enactments of violent crimes. The reason given is that these re-enactments add to people's fears about violent crime by making it look more common than it is. Some support for this reason is offered by evidence from a survey showing that people do indeed think that violent crime is more common than it is, and that the elderly are the most fearful, although they are the least likely to be affected. The argument assumes that if the re-enactments were not shown, people, and particularly the elderly, would be less afraid of being a victim of violent crime. **D** weakens the argument, since if those most afraid of crime do not watch the programmes, then stopping showing re-enactments will have little effect on levels of fear of crime.

A does not weaken the argument that it is time to stop making programmes that contain re-enactments of violent crime, since if these re-enactments are increasingly realistic, this is a good reason for thinking that they may increase people's fear of crime.

B does not weaken the argument, since if elderly people are unaware of the crime statistics, they may be more inclined to form their opinions of the risk of being a victim of violent crime from the sort of television programmes described in the argument.

C does not weaken the argument, because the argument relies on people's perceptions of the amount of violent crime, rather than the actual amount of violent crime.

E does not weaken the argument, since the argument assumes that perceptions of crime are not based on statistics.

- 15 The 400 seats in a parliament are divided amongst five political parties. No two parties have the same number of seats, and each has at least 20 seats.

What is the largest number of seats that the third largest party can have?

- A 22
- B 118
- C 119
- D 120
- E 121

Five parties share 400 seats. For the third largest party to have the maximum number of seats, the other parties must have the minimum number, whilst still meeting the other conditions set out in the question. So the fourth and fifth largest parties will have 21 and 20 seats respectively. This leaves 359 seats to be divided between the three largest parties.

For the third largest party to have as many seats as possible, the other two must have only slightly more seats. If we divide the remaining 359 seats as nearly as possible into thirds, we get:

$1^{\text{st}} = 120$; $2^{\text{nd}} = 120$; $3^{\text{rd}} = 119$. However, this violates the condition that no two parties have the same number of seats. To avoid this, one of the seats of the third largest party must be transferred to the largest party.

This gives: $1^{\text{st}} = 121$; $2^{\text{nd}} = 120$; $3^{\text{rd}} = 118$; $4^{\text{th}} = 21$; $5^{\text{th}} = 20$.

The correct answer is **B**.

- 16 In an effort to monitor my fuel bills last winter I recorded the readings on the gas and electricity meters on the first of each month as follows:

	<i>Gas</i>	<i>Electricity</i>
1st October	2842	5368
1st November	3029	5874
1st December	3281	6355
1st January	3473	6891
1st February	3668	7506
1st March	3914	8052
1st April	4082	8511

During which month did I use the most gas?

- A November
- B December
- C January
- D February
- E March

The column of electricity meter readings must be ignored, because the question only concerns the amount of gas used.

A significant amount of time can be saved by observing that only between 1st November and 1st December and between 1st February and 1st March do consecutive readings differ by more than 200. This means that only two calculations are required, rather than six, as follows:

Gas used during November = $3281 - 3029 = 252$ units.
Gas used during February = $3914 - 3668 = 246$ units.

The correct answer is **A**.

17 Levels of financing health services in advanced industrial countries have little effect, statistically speaking, on the health of the population. There are countries which spend six times as much per head on health care as Britain, and countries which spend only half as much: their populations end up with more or less the same life expectancy. Therefore arguments about levels of financing Britain's National Health Service are largely irrelevant to the health of the population.

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

- A** The cost of Britain's Health Service is disproportionate to its effectiveness.
- B** Spending is the most effective way of improving a health service.
- C** Advanced industrial countries have failed to improve the health of their population.
- D** Governments have a responsibility to organise efficient health care systems.
- E** Life expectancy is a reliable measure of the health of the population.

The conclusion of the argument is signalled in the last sentence by the word 'therefore'. It is that arguments about levels of financing the health service are largely irrelevant to the health of the population. Another way of expressing this is that the amount of money put into the health service does not make much difference to the health of the population in the sense that if the level of finance increased, the health of the population would not necessarily improve; and if it decreased, the health of the population would not necessarily deteriorate. To support this, the argument compares Britain's financing of the health service with other countries, some of which spend much more per head, and some much less per head than Britain. It claims that despite these differences, the populations in all countries end up with more or less the same life expectancy. To use life expectancy in order to draw a conclusion about the health of the population, it must be assumed that life expectancy can indicate how healthy the population is. Thus **E** must be assumed.

A is not assumed. A claim that the cost is disproportionate to effectiveness must assume that either Britain's spending on health is at a level which should produce greater effects, or that the effects are greater than one would expect given a relatively low level of spending. Thus **A** assumes that there is a relationship between the amount spent on health and the healthiness of the population, which is what the passage argues against.

B also goes against what is argued in the passage, because the passage argues that spending has little effect on the health of the population. So **B** is not assumed.

C is not an assumption underlying the argument, because the argument draws no conclusion about the actual state of health of any population.

D does not need to be assumed by this argument, because the argument is not concerned with whether governments or private companies should organise health systems.

- 18 The table shows the numbers of male and female students studying a selection of subjects at a college.

<i>Subject</i>	<i>Male</i>	<i>Female</i>
Biology	24	41
Geography	26	32
German	3	12
Mathematics	104	61
Music	6	10
Sociology	18	67

In which other subject was the balance of male and female students closest to that for Music?

- A Biology
- B Geography
- C German
- D Mathematics
- E Sociology

This is a question that does not require precise calculations. You should observe that the number of male students studying Music is just over half the number of female students.

The only other subject for which the number of male students is close to half the number of female students is Biology. The number of male students studying Biology is just over half the number of female students, similar to the balance of male and female students studying Music.

The correct answer is **A**.

19 Ever since Uranus was discovered in 1781, astronomers have thought there might be more planets to be discovered in the Solar System. Because of small deviations in the orbits of Uranus and Neptune - deviations which would occur if another planet existed - some astronomers think there must be an undiscovered planet - Planet X. But the search for Planet X is futile, because these deviations would occur if the orbits had been wrongly predicted. Since Uranus and Neptune take many decades to circle the sun, astronomers must rely on old data in order to calculate their orbits. If this data is inaccurate, the calculated orbits are wrong. If the calculated orbits are wrong, Uranus and Neptune will deviate from them even if there is no Planet X.

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

- A From the fact that the old data is inaccurate, it cannot be inferred that the calculated orbits are wrong.
- B From the fact that the data about the orbits is old it cannot be inferred that it is inaccurate.
- C From the fact that deviations occur which would occur if Planet X existed, it cannot be inferred that Planet X exists.
- D From the fact that the calculated orbits are wrong, it cannot be inferred that Uranus and Neptune will deviate from them.
- E From the fact that Planet X has not been discovered, it cannot be inferred that the search for it is futile.

The first two sentences of the passage explain the context which is the background for the argument. The conclusion of the argument is that the search for Planet X is futile, and immediately a reason is given for this, i.e. that the deviations in the orbits of Uranus and Neptune would occur if the orbits had been wrongly predicted. The argument never actually states that the orbits have been wrongly predicted, but attempts to establish this with the following claims:

- Since Uranus and Neptune take many decades to circle the sun, astronomers must rely on old data in order to calculate their orbits.
- If this data is inaccurate, the calculated orbits are wrong.
- If the calculated orbits are wrong, Uranus and Neptune will deviate from them even if there is no Planet X.

But the most we are told about the data is that it is old and that if it is inaccurate, the orbits that have been calculated will be wrong. The argument must be assuming that because the data is old, it must be inaccurate. But this is an unjustified inference without further evidence. Thus, as **B** states, it cannot be inferred that the calculated orbits are wrong, and the argument cannot establish that there is no reason to think that Planet X exists.

A does not identify a flaw because if it were a fact that the old data is inaccurate, it would be reasonable to conclude that the calculated orbits were wrong.

C does not identify the flaw, because the argument does not conclude that Planet X exists.

D does not identify the flaw, because the argument does not infer that Uranus and Neptune will deviate from the calculated orbits. Instead, it states as fact that if the calculated orbits are wrong, then Uranus and Neptune will deviate from them. In this type of question, we are not trying to identify statements which may be untrue. We are trying to identify the answer that explains why the conclusion does not follow, even if all the reasons are true.

E does not identify the flaw, because the argument does not rely on the fact that Planet X has not been discovered as a reason for concluding that it does not exist.

20 The island Republic of Outlandia has three banks, Barkers, Floyds and National. During a particular day Barkers customers have written cheques worth three million Lira to Floyds customers and cheques worth four million Lira to National customers. Floyds customers have written cheques worth four million Lira to Barkers customers and cheques worth five million Lira to National customers. National customers have written cheques worth three million Lira to Barkers customers and cheques worth two million Lira to Floyds customers.

The banks could settle all the debts to each other that arise because of these cheques by:

- A** Floyds Bank paying one million Lira to Barkers Bank and Barkers Bank paying one million Lira to National Bank.
- B** Floyds Bank paying three million Lira to National Bank.
- C** Floyds Bank paying four million Lira to National Bank.
- D** Barkers Bank paying one million Lira to National Bank.
- E** Barkers Bank paying four million Lira to National Bank.

The most efficient way of approaching this question is to investigate the overall effect of making all of the payments described, as follows:

Barkers would pay Floyds three million Lira and National four million Lira, and would receive four million Lira from Floyds and three million Lira from National. Payments and receipts would cancel each other out.

Floyds would pay Barkers four million Lira and National five million Lira, and would receive three million Lira from Barkers and two million Lira from National. The payments would be four million Lira greater than the receipts.

National would pay Barkers three million Lira and Floyds two million Lira, and would receive four million Lira from Barkers and five million Lira from Floyds. The receipts would be four million Lira greater than the payments.

All the debts could therefore be settled by Floyds Bank paying four million Lira to National Bank.

The correct answer is **C**.