



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education  
Advanced Subsidiary Level and Advanced Level

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**THINKING SKILLS**

**9694/01**

Paper 1 Multiple Choice

**May/June 2009**

**1 hour 30 minutes**

Additional Materials:      Multiple Choice Answer Sheet  
   Soft clean eraser  
   Soft pencil (type B or HB is recommended)

\* 6 2 1 7 0 1 6 7 2 6 \*

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**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

There are **30** questions on this paper. Answer **all** the questions.

For each question there are five possible answers **A, B, C, D** and **E**. Choose the **one** you consider correct and record your choice in pencil on the separate answer sheet.

**Read very carefully the instructions on the answer sheet. Ignore responses numbered 31 – 50 on the answer sheet.**

**INFORMATION FOR CANDIDATES**

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

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This document consists of **18** printed pages and **2** blank pages.



- 1 Next leap year my birthday is on a Friday 13th.

What is the chance that the month it is in has five Sundays?

- A 30 in 366
- B 1 in 7
- C 2 in 7
- D 11 in 12
- E certain

- 2 An amateur drama company is putting on a production of a musical. They have their own hall, which seats 100 people and where they charge \$4.00 for a ticket. The local arts theatre seats 300 and costs \$480 a night to hire. The facilities at the arts theatre are better, so the company can charge \$4.50 for a ticket there. All other expenses are equal in the two venues and have been covered already.

If they use the arts theatre, how many tickets would the company need to sell on any given night to ensure they make more profit than if using their own hall? [Profit = income minus costs.]

- A 18
- B 89
- C 196
- D 220
- E 221

- 3 In Bankland the banks are closed on two successive days, but not on Saturday and Sunday. You can deposit cheques with the cashier or, when the banks are closed, at the box outside the bank.

Cheque processing always starts on the first working day after the cheque is deposited. The bank always processes it within the same number of working days.

When you deposit a cheque on Monday the bank will then process the cheque and the money will be available on Sunday. When you deposit a cheque on Wednesday the money will be available on Monday. When you deposit a cheque on Friday the money will be available on Tuesday.

The weekend falls on:

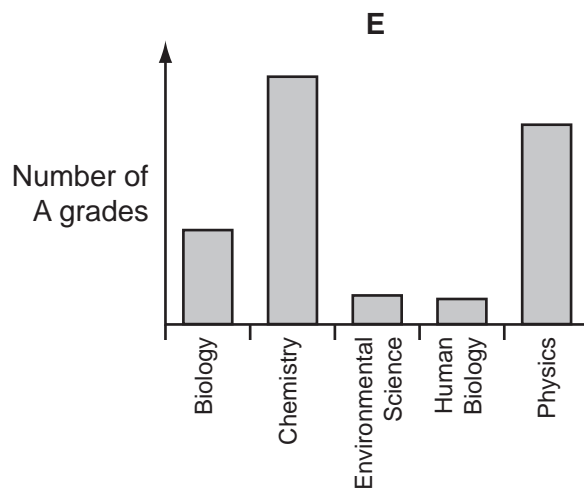
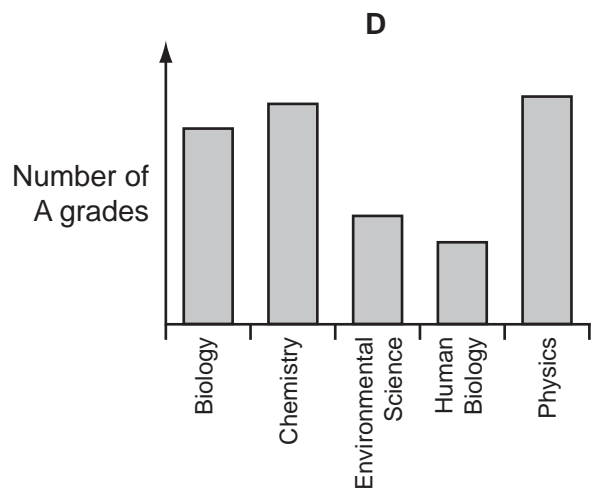
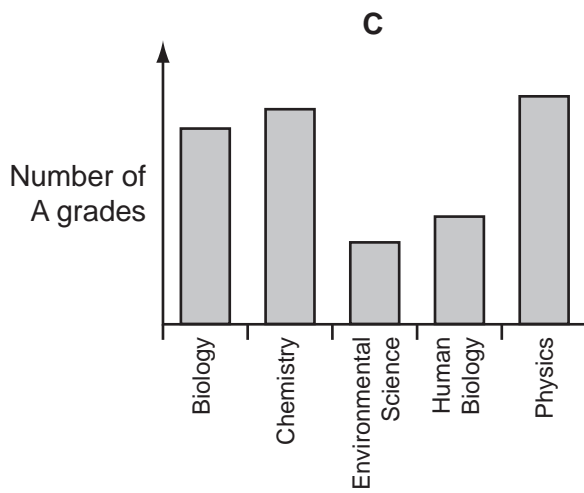
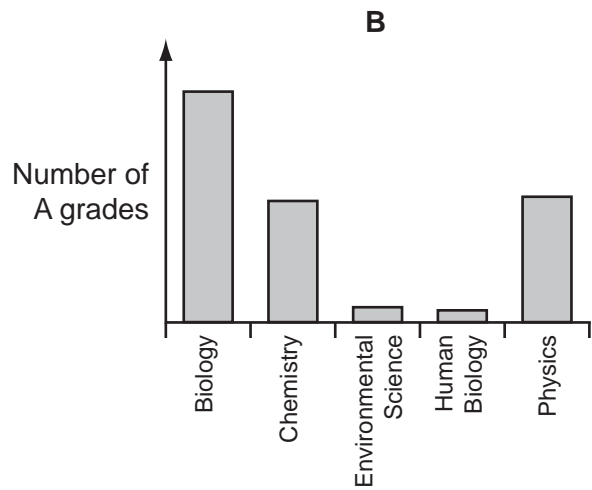
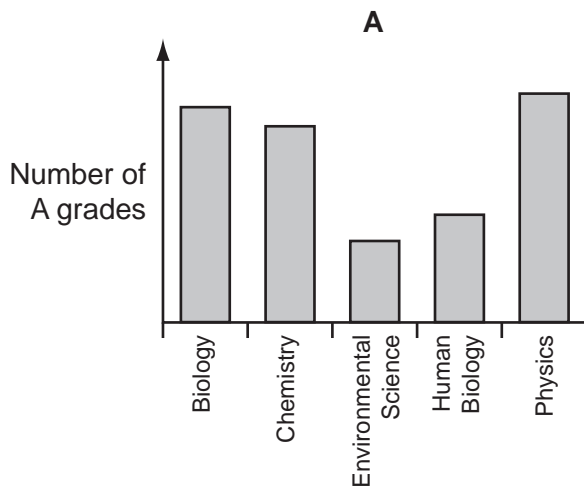
- A Monday and Tuesday.
- B Tuesday and Wednesday.
- C Wednesday and Thursday.
- D Thursday and Friday.
- E Friday and Saturday.

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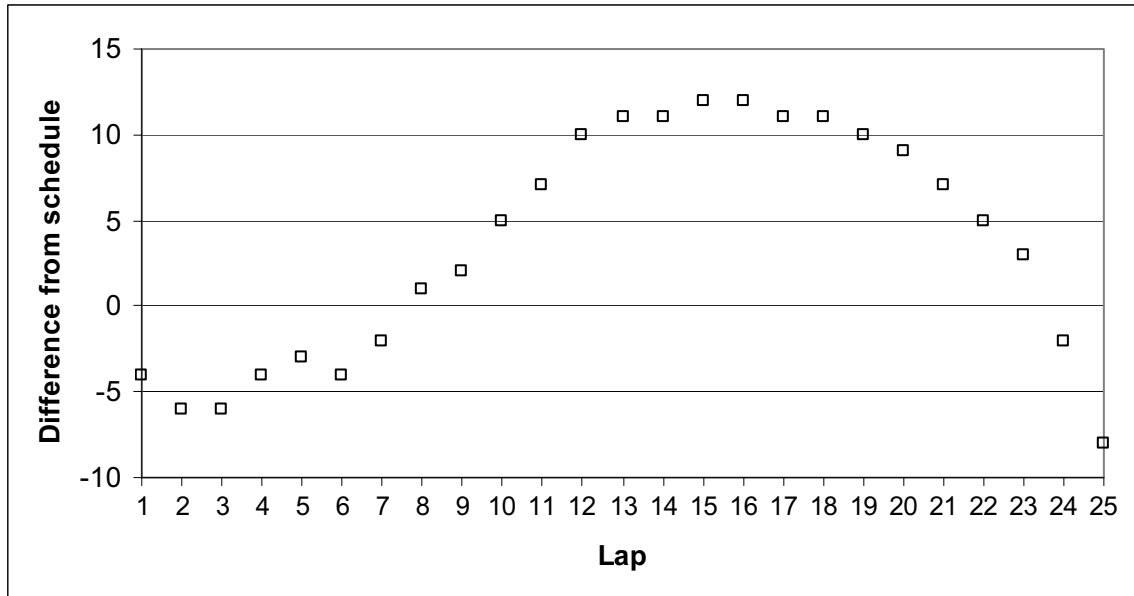
- 4 The following table shows the total number of entries received by an exam board for a variety of science subjects for June 2008. It also shows the % of candidates who achieved an A grade for each subject.

Subject	Biology	Chemistry	Environmental Science	Human Biology	Physics
Number of entries	22377	11932	1431	1216	9594
% A grades	27.6	30.1	11.5	15.2	32.1

Which one of the following charts correctly represents the percentages shown in the table?



- 5 The runner Sven Hashmi recently tried to break his country's 10km running record of 27 min 30 sec. In order to achieve this he had to run at an average time of better than 66 seconds for each 400m lap. His **cumulative** progress is shown in the graph below. An entry of 4 means he was 4 seconds behind the schedule after the lap shown, whilst  $-2$  means he was 2 seconds ahead of the schedule at that point.



How much ahead of the schedule did he run for the last 2000m?

- A 5 seconds  
 B 8 seconds  
 C 9 seconds  
 D 17 seconds  
 E 19 seconds
- 6 In an argument there must be a conclusion and one or more reasons given to support the conclusion.

From the above definition, which one of the following is most obviously an **argument**?

- A Many people use the internet for shopping. It helps save time for people with demanding jobs and it is also useful for people who work from home.
- B People are increasingly using the internet for shopping. If this trend continues then we are likely to see a decline in the number of shops in traditional retailing areas.
- C Using the internet for shopping has increased significantly over the last 5 years. With increased computer ownership this trend is likely to continue.
- D We have come to depend increasingly on the internet for shopping rather than using local shops. This is regrettable.
- E Although internet shopping has increased we should remember that not everybody has access to a computer or is happy about using them.

- 7 The hearing ability of 10 000 people around the world has been studied over the past ten years. Very surprisingly, those people who live in quiet, rural areas had hearing that was very poor. On the other hand, groups of people who are exposed to constant noise, such as orchestral musicians and airline pilots, had very good hearing. Young people will be cheered to discover that there was little difference between those who go clubbing and those who don't. The explanation is that continuous exposure to noise trains the ear to tolerate it, a process that cannot happen with very loud but rare noise. As a result, people who live in towns and cities will have better hearing than those who live in the country.

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

- A People who have poor hearing should not live in the countryside.
  - B People in jobs that require ear-protection because of noise will tend to have poor hearing.
  - C People who live in towns and cities do not notice the loudness of the traffic around them.
  - D People's hearing is more at risk of damage at firework displays than in very busy city streets.
  - E People who go clubbing will suffer less damage from sudden loud noises than those who don't.
- 8 The amount of electricity used by items such as TVs and videos in 'standby mode' is as much as 6% of the UK domestic electricity bill, a staggering £500 million a year. Items such as hairdryers and mobile phone chargers also contribute, as they use electricity when they are plugged in but not in use. Although it would be good for the environment to unplug all electrical appliances when they are not in use, each of the 25 million UK households would save only about £20 each year as a result. A larger sum of money would be needed to change people's habits, and the country will therefore continue to waste huge amounts of electricity.

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

- A A significant proportion of UK households use hairdryers or mobile phones.
- B A significant number of UK households do not already switch off or unplug electrical items when they are not in use.
- C Cost is the only factor affecting the use of electricity in a significant proportion of UK households.
- D A significant proportion of UK consumers do not understand the effect of electricity consumption on the environment.
- E Electricity consumers in the UK would change their habits if they were made aware that this would be good for the environment.

- 9 People are rightly encouraged to wash their hands after visiting toilets. However, although lavatory seats have been found to have 49 microbes per square inch on them, this is insignificant compared to the number found on everyday items in an office. Desks have been found to have 20 961 microbes per square inch on them; telephone earpieces had 25 127. This is unsurprising in that most microbes are spread by unclean hands, coughing and sneezing. The health risks from working in such an environment are obvious. People should ensure that desks and telephones (and any other equipment used by more than one person) are disinfected regularly. Unless they do, there will be a high chance of staff picking up diseases and thus having to take time off.

Which one of the following is the best statement of the **main conclusion** of the above argument?

- A There are obvious health risks from working in an office.
  - B Regular disinfection of office equipment needs to be carried out.
  - C If office equipment is not disinfected regularly, staff will have to take time off through sickness.
  - D Without regular disinfection of office equipment, staff in offices will pick up diseases.
  - E It should not surprise us that office equipment has such a high number of microbes per square inch.
- 10 UK children have the highest rate of asthma in the world. Almost a third of 13-14 year olds in the UK report that they have symptoms of the disease, three times the rate of France, Germany and Italy. Given that the UK is similar to these other countries in being a technologically-advanced urban society, there's no obvious difference to explain the higher rate. This indicates that the explanation must be to do with diagnosis. Either UK doctors are too willing to diagnose children as asthmatic or doctors in France, Germany and Italy are too unwilling.

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

- A The author comes to a conclusion on diagnosis that is self-contradictory.
- B The author restricts the argument to only four countries.
- C The author restricts the options to either explaining a high rate or a low rate of asthma.
- D The author fails to consider alternative possible explanations for the different rates of asthma.
- E The author fails to distinguish between reporting symptoms of asthma and having the disease.



- 11 Peter travels to work by train and bus every day. He starts work at different times each day, but sometimes on the hour or sometimes at half past the hour. He gets to the train station 45 minutes before he is due at work and the train journey takes 20 minutes, after which he takes a bus from the station to work which takes 10 minutes. The train leaves every 20 minutes, starting on the hour. Some days Peter finds that he gets to work 5 minutes early. On all the other days he finds that he gets to work 5 minutes late.

Which one of the following could explain the times that Peter arrives at work?

- A The buses leave at 5 and 35 past each hour.
  - B The buses leave at 15 and 45 past each hour.
  - C The buses leave at 25 and 55 past each hour.
  - D The buses leave at 5, 25 and 45 past each hour.
  - E The buses leave at 15, 35 and 55 past each hour.
- 12 Harry lives at the top and Joe lives at the bottom of a hill 6 km long. Each Saturday they meet at a bench on the hill somewhere between their houses. They find that, if they both leave their houses at 10 am, they arrive at the bench at the same time. They both walk at 2 km/hr uphill and 6 km/hr downhill. After talking for an hour they each return home.

How much earlier does Joe arrive home than Harry?

- A They arrive at the same time.
  - B Joe arrives  $\frac{1}{2}$  hour before Harry.
  - C Joe arrives 1 hour before Harry.
  - D Joe arrives  $1\frac{1}{2}$  hours before Harry.
  - E Joe arrives 2 hours before Harry.
- 13 A 'guess the number of sweets' competition at a village fair only had five entries, and there was some surprise that Angela had got the number exactly right.

She had simply estimated the number of sweets across the base and up the side of the full, tall, square-based jar and calculated her answer from these figures.

These were the entries. How many sweets were there in the jar?

- A 343
- B 595
- C 612
- D 667
- E 726

- 14 Ted needs to transport several boxes to his two friends. He has 7 boxes belonging to Alex and 8 boxes belonging to Chris. Chris also has 4 boxes at his house that belong to Alex, and Ted has agreed to move them as well. All of the boxes are the same size and Ted can fit 5 boxes in his car for each journey. The distance between houses is given in the table:

Between	Ted and Alex	Ted and Chris	Alex and Chris
Distance (miles)	3	5	2

What is the shortest distance that Ted will need to drive to move all of the boxes and get home?

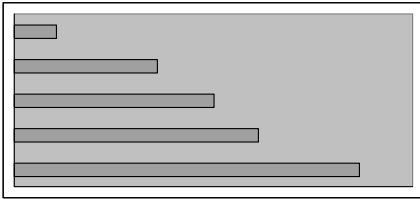
- A 18
- B 26
- C 30
- D 32
- E 36

- 15 In an election for the President of the Student Union, the votes gained by each of the candidates are:

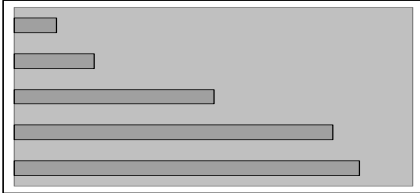
Stephen Armstrong	367
Jenny Cox	215
Dominic Foley	64
Petra Kennedy	520
Stephanie Palmer	300

Which one of the following charts, suitably labelled, accurately displays this result when the candidates' votes are put in ascending order?

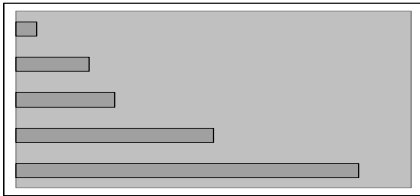
A



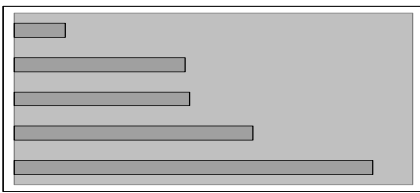
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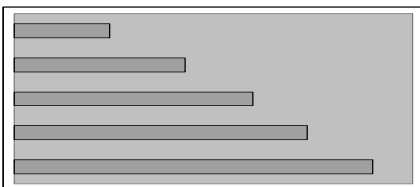
C



D



E



- 16 Two new competing blue laser technologies are set to revolutionise DVD playback/recording, and will eventually offer consumers improved picture quality, extended storage capacity and improved versatility. This competition between the two formats is good news for consumers. The intense rivalry between the electronics companies means that the format that finally becomes dominant will have to outperform the rival blue laser format, and is certain to be the highest quality, best value-for-money DVD playback system available.

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

- A Most consumers think style and practicality are more important than cost and quality.
  - B The VHS video format became dominant in the early 1980s despite the technical superiority of the competing Betamax format.
  - C Many consumers find it difficult to operate unfamiliar technological systems.
  - D In other areas, such as video cameras, there remain several different formats available to consumers.
  - E In past battles over formats the products produced by the largest electronics companies have always been dominant.
- 17 Many of the large mammals, such as lions and elephants, are threatened with extinction. The last big extinction of large mammals was 10 000 – 50 000 years ago, when creatures such as the mammoth disappeared. This extinction had two causes: climate change and human activity (such as hunting). Interestingly, large mammals are similarly threatened today. Human activity such as people encroaching on land needed by animals threatens these animals' survival. Climate change is an increasing problem (especially for polar bears). The lesson of history is clear. We will lose the large mammals unless we act. If we can do little about climate change, we can at least protect them from human activity. Reserves in which large mammals are not threatened have to be created very urgently.

Which one of the following is the best statement of the **main conclusion** of the above argument?

- A Areas in which large mammals are protected need to be established as soon as possible.
- B Large mammals face the same threats to their survival as did those 10 000 – 50 000 years ago.
- C We will lose the large mammals unless there is action taken to protect them.
- D Though we can do little about climate change, we can restrict the effects of human activity on large mammals.
- E Large mammals will survive if we create reserves which are protected from human activity.

- 18 If very harsh punishments were an effective deterrent, there would have been no pickpocketing at the scene of public executions in the 18th century. In fact pickpocketing was rife at these occasions. Clearly harsh punishments do not deter. Since there would only be good reason to increase the severity of sentences if this increased the deterrent effect, current proposals to impose heavier sentences on convicted criminals are pointless.

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

- A People will not steal, even if desperate, if the penalties are severe.
  - B People would be deterred from committing crimes if they thought they were likely to be caught.
  - C The punishment for pickpocketing in the 18th century was very severe.
  - D Deterrence is the only justifiable reason for sending criminals to prison.
  - E Heavier sentences will not stop prisoners from re-offending after their release.
- 19 Titan, the largest moon of Saturn, is unusual. It has an atmosphere (unlike other moons). This atmosphere is fairly Earth-like, being composed mainly of nitrogen. There is probably an ocean below the surface ice, an ocean containing ammonia and up to 200 kilometres deep. However, there is a crucial difference between Titan and the Earth: Titan's surface temperature is about  $-180^{\circ}\text{C}$ . So it would seem that life could not exist there. But that is to look at life only from our perspective. If you were a Titanian, you would look at Earth and ask 'how could life ever develop in the oven temperatures there, with high levels of radiation from the Sun, and poisonous oceans?' We should therefore accept that life has probably developed on Titan.

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

- A Just because life has developed on Earth does not mean that it has also developed on Titan.
- B Just because a hypothetical Titanian could doubt the existence of life on Earth does not mean there is life on Titan.
- C Just because we can doubt that life has developed on Titan does not mean that there is no Titanian life.
- D Just because there are some similarities between Titan and Earth does not mean that Titan has developed Earth-like life.
- E Just because Titan's surface temperature is so low compared to Earth's does not mean that there are not higher temperatures below the surface.

- 20 Over the past 92 years, the record for the men's 100 metres race has been reduced by only 0.82 seconds. This is despite the huge changes in the technology of athletics: computer-designed lightweight shoes, standardised running tracks, specialist clothing. This technology must have had some positive effect on performance, but the striking thing is how little. Athletes of the 1950s and 1960s had none of these advantages. Even more significantly, if we go back over two hundred years, people were fitter than they are today. They used to walk and run everywhere. Sixteenth century longbows have been discovered, and very few men alive today can pull them: they're not strong enough. Hundreds of years ago, people must have been very, very strong.

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

- A Today's athletes produce performances that are less good than has been predicted.
  - B Today's best athletes are probably not the best of all time.
  - C Athletic performance would have declined if athletes had not used the technology of athletics.
  - D If they were performing today, athletes of the 1950s and 1960s would have broken today's records.
  - E None of today's sportspeople is as strong or fast as people hundreds of years ago.
- 21 A school is arranging a trip to the zoo for a class. A teacher and a classroom assistant will travel with them but some extra adults will be needed, so parents will be asked to volunteer. The safety rules for trips state:

'There must be at least one adult for each 6 children aged seven or over, at least one adult for each 4 children under the age of seven, plus two extra adults to cope with any emergencies.'

The class has a mix of ages; there are 12 children who are 6 years old and 16 children who are 7 years old.

At least how many parents are needed to travel with the class?

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

- 22 A group of nine friends go to play a game of Ten Pin Bowling. They each need to hire a pair of shoes specially designed for the surface they play on.

Unfortunately, the bowling alley does not have the correct size shoe for all the friends. The shoe sizes available are shown in the table below.

Shoe size	6	8	9	11
Number of pairs available	3	2	2	3

The nine friends and their shoe sizes are shown below.

Friend	Alan	Bob	Carl	Don	Eva	Fred	Greg	Hank	Ivan
Shoe size	5	6	6	7	9	10	10	6	7

What is the maximum number of friends which will receive at most one size too big?

- A 3
- B 5
- C 6
- D 8
- E 9

- 23** Mr Jones teaches AON students at two levels and also teaches IGCSE students. In a single class the number of students must be between 15 and 25. The students of two AON levels can be enrolled in the same class. Mr Jones is paid \$25.96 per hour. He has 1 hour per week with each group of AON students and 4 hours per week with each group of IGCSE students.

The number of AON level 1 students: 183  
 The number of AON level 2 students: 110  
 The number of IGCSE students: 31

How much does Mr Jones earn per week from the classes?

- A** \$337.48  
**B** \$363.44  
**C** \$389.40  
**D** \$519.20  
**E** \$545.16
- 24** In a survey carried out on a group of 11 to 18 year-olds it was reported that 80% owned a personal stereo and 50% owned a bicycle.

Which one of the following hypotheses can be confirmed from the information given?

- A** Half of those having a personal stereo also had a bicycle.  
**B** All those surveyed had either a personal stereo or a bicycle.  
**C** Half of those who had a bicycle did not have a personal stereo.  
**D** 1 in 5 of those surveyed had neither.  
**E** At least 30% had both a bicycle and a personal stereo.
- 25** Four men had to travel from one town to another, one hundred kilometres apart. There are five transport firms who all adopt different pricing policies.

Bus Company 1: Fixed price ticket \$28 each.  
 Bus Company 2: Minimum charge for each passenger \$15 + \$1.20 for every 10 km travelled by each passenger.  
 Railway: \$3 each for every 10 km travelled.  
 Taxi: \$10.50 for every 10 km travelled (a single price covering everyone in the taxi).  
 Airline: \$40 per person but a 40% discount for a group booking of 4 or more.

What is the lowest total cost to get the four men from one town to another?

- A** \$27  
**B** \$28  
**C** \$96  
**D** \$105  
**E** \$108



- 26 The large number of empty seats at the Athens Olympics suggests that it was not a successful event, either financially or in terms of public involvement. If the next Olympic Games in 2012 are to be successful, London will need to address this problem by having plans that will ensure full venues throughout the two week period. It is therefore essential that the organisers of the 2012 Games are committed to lowering ticket prices.

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

- A The people of Athens were uninterested in their Olympic Games.
  - B The Athens Olympics was not well planned.
  - C Olympic bids are successful only if they can demonstrate a benefit to the community.
  - D In Athens the high price of seats was an important reason for the many unsold tickets.
  - E It is unlikely that all the tickets for the London Olympics will be sold.
- 27 The misery of traffic jams is only going to get worse according to trends revealed by Department of Transport data. Over the last 20 years, total traffic volumes have increased by 77%, the majority of the increase being accounted for by car traffic which has increased by 83%. In the same period, investment in the road network has fallen by almost 20%. Traffic jams mean frustration for motorists and lost revenue for businesses. Increasing our investment in our road network, and thereby increasing its capacity, is vital if we are to ease the many problems caused by traffic jams.

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

- A The rate of increase of traffic volumes has decreased slightly in the last 10 years.
- B Motorways account for only 1% of total road capacity, but carry 19% of traffic.
- C New road building has increased the total available road capacity by 10% in the last 20 years.
- D Private investment in toll roads has increased dramatically in the last 20 years.
- E Increasing the capacity of the road network encourages more traffic onto the roads.

- 28 There has been considerable publicity regarding the dangers of exposure to the sun. People who lie on the beach in order to get a tan are encouraged to put on high factor sun creams to reduce the risk of skin cancer. However, we should remember that sunshine provides us with Vitamin D, and this is important in keeping our bones strong and in helping to protect us against various diseases. Sun protection creams considerably reduce the body's ability to make Vitamin D. In consequence we must ensure that we have frequent exposure to the sun for the sake of our health.

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

- A The author fails to show that, though Vitamin D is necessary for health, sunshine is the only source of it.
  - B The author fails to specify how frequent exposure to the sun could be beneficial to our health.
  - C The author's conclusion is inconsistent with their advice about the dangers of exposure to the sun.
  - D The author does not explain why Vitamin D is the main factor in determining our health.
  - E The author fails to consider the benefits of sunshine to our health other than Vitamin D.
- 29 When we do well, or win, most of us will attribute our good performance to our own skills and talents. However, we all seek to attribute our poor performance to some outside problem, such as poor decisions by umpires or referees. This is particularly true when we lose, and in a competitive situation there is obviously some chance that any team or individual will lose. It is possible that umpires and referees make unfair decisions, but the source of all the complaints about their decisions is more likely to be our natural ways of explaining our performance.

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

- A Blaming a loss in sport on one's own lack of skill is bad for the individual's self-esteem.
- B Managers of teams at the top of a league table were found to be less likely to complain about referees than managers of teams at the bottom of a table.
- C Managers of teams at the top of a league table were found to be more likely to complain about referees than managers of teams at the bottom of a table.
- D The number of complaints about referees is far greater in team sports than in individual sports.
- E Managers of teams at the top of a league table were found to make fewer but stronger complaints about referees.

- 30 There has been a sudden steep decline in the numbers of vultures in India. Vultures keep the towns and villages clean by consuming the carcasses of cows, which are left where they die, because in India cows are sacred. If the carcasses are not consumed, serious diseases such as anthrax will increase in the human population. In some places, the decline of vultures has led to an increase in the numbers of wild dogs, which also feed on the carcasses of cows. These dogs are carriers of rabies, and the increase in their numbers dramatically increases the risk to humans of catching rabies.

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

- A The decline in the numbers of vultures in India is caused by disease.
- B The decline of vultures increases the risk of disease amongst people in India.
- C The incidence of rabies is not likely to increase in the human population of India.
- D The sudden steep decline in the numbers of vultures in India could be reversed.
- E The increase in the numbers of wild dogs in India will reduce the risk of disease for humans.

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