INSTRUCTIONS TO CANDIDATES

Please read these instructions carefully, but do not open this question paper until you are told that you may do so. This paper is Section 1 of 2.

A separate answer sheet is provided for this paper. A separate text booklet is also provided for Part C. Please check you have these. You also require a soft pencil and an eraser.

Please complete the answer sheet with your candidate number, centre number, date of birth, and name.

At the end of 80 minutes, your supervisor will collect this question paper and answer sheet before giving out Section 2.

This paper contains three parts: A, B, and C.

All candidates should complete Part A Thinking Skills (22 questions).

All candidates should then complete one further part chosen from:

Part B  Mathematics and Biology (30 questions)
Part C  Reading Comprehension (24 questions)

You are strongly advised to spend 40 minutes on Part A and 40 minutes on your chosen part.

There are no penalties for incorrect responses, only marks for correct answers, so you should attempt all of the questions in your two parts. Each question is worth one mark.

For each question, choose the one option you consider correct and record your choice on the separate answer sheet. If you make a mistake, erase thoroughly and try again.

You must complete the answer sheet within the time limit.

You can use the question paper and text booklet for rough working, but no extra paper is allowed. Only your responses on the answer sheet will be marked.

Dictionaries and calculators may NOT be used.

Please wait to be told you may begin before turning this page.

This question paper consists of 52 printed pages and 4 blank pages.
Paper content
PART A Thinking Skills .......................................................... 5
PART B Mathematics and Biology ........................................... 21
PART C Reading Comprehension .......................................... 49
PART A Thinking Skills
1 Fear of death prompted us to develop technology that helps people live longer. But those same technological advances have condemned us to fear of infirmity and dementia, since so many of us will live to an advanced age. So as to eliminate this new fear, once we have reached old age we should be assisted to die if we choose death over a sad decline. According to current estimates, dementia affects almost 50 per cent of people by the age of 85, and bodily infirmity is guaranteed to develop further the older we get. There is no cure for old age.

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

A Technology has advanced to the point where we can now choose when to die.
B Euthanasia should be readily available to people who have reached a certain age.
C The fear of infirmity and dementia is worse than the fear of death.
D We must develop technology to cure dementia and infirmity.
E We should focus on the health of the young instead of that of the old.

2 There are 24 pupils in a class. They decided to help the local park by planting a total of 24 plants, a mixture of birch trees and roses. Each girl planted three roses, and every three boys planted one birch tree between them.

How many more boys than girls are there in the class?

A 3  
B 6 
C 8 
D 12 
E 18
PART A Thinking Skills

3 Mobile phone use and driving under the influence of alcohol are not the only examples of irresponsible driver behaviour. Tiredness when driving a vehicle is said to be responsible for 300 deaths per year. Astonishingly, almost half of male drivers and 22% of female drivers admit to having fallen asleep at the wheel. If we assume (and it seems reasonable to do so) that even more people are injured than killed as a result of accidents caused by tiredness, it is clear that tiredness while driving is a major road safety issue – and entirely preventable. If we wish to preserve our own lives and those of others we should not drive a car knowing that we have had insufficient sleep or rest to drive safely.

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

A Women are more careful than men about driving when they are tired.
B Drivers are able to recognise when they are dangerously tired.
C Falling asleep when driving is more dangerous than using a mobile phone while driving.
D People whose jobs involve long distance driving can always avoid driving while tired.
E Tiredness has been insufficiently highlighted in road safety campaigns.

4 There has been a significant rise in the number of children with rickets. This has resulted from the airless, indoor world we have created for ourselves. Rickets is caused by a deficiency of vitamin D, which is produced in response to sunlight on the skin. Where children used to play outside they mostly stay indoors immersed in virtual realities via various electronic media. Instead of long summer evenings outdoors, we close the curtains to prevent sunlight falling on our screens. The lure of technology is compounded by adult fears of the risks to children if they are left to roam free in the outside world; in any case there are fewer accessible public spaces for open air activity. Curing this will require an awful lot more than vitamin pills.

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

A There has been a large growth in areas designated as national parks and in urban parkland.
B Diet has a much more significant effect on vitamin D intake than sunlight.
C The incidence of rickets is confined to a few hundred cases a year.
D In the 19th century, when the incidence of rickets was much higher, terrible air pollution and smog affected the large population of city dwellers.
E Many people can’t afford or be relied on to take vitamin D supplements.
5 When mobile phones first became relatively inexpensive many parents bought them for their teenage children on the grounds that having access to a phone would keep them safe. High profile cases of abduction at the time underscored the need to improve safety for young people. But today mobile phones invariably have access to the internet, which has made young people vulnerable to stalking and cyberbullying. Since the stated case for buying teenagers mobile phones was to keep them safe, we should now restrict their access to them.

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

A The incidence of cyberbullying and stalking does not undermine the respects in which mobile phones keep teenagers safe.

B If you restrict young people’s access to mobile phones they will continue to bully one another on other devices.

C Access to mobile phones has not stopped teenagers from being attacked while out alone at night.

D The majority of teenagers are not affected by the problems of stalking and cyberbullying.

E It ignores the fact that there are other ways of keeping children safe.

6 Jake has a 500 ml bottle of orange squash that he has made according to the instructions on the bottle of concentrate. The instructions dictate that he should add 4 parts water to 1 part concentrate. He accidentally spills his squash, and now there is only 400 ml in the bottle. He then tops up the remainder with concentrate.

What percentage of the squash in his 500 ml bottle is now concentrate?

A 18%

B 20%

C 28%

D 36%

E 40%
A Youth Centre runs a number of football teams for boys of different ages. Each season, one prize is awarded to the player who has given the best all-round performance. Five players have been nominated as possible recipients of this year’s prize. The manager has decided not to reward any player who has missed two consecutive training sessions more than twice, and the manager will also exclude anyone who has failed to score a goal from a penalty kick more than twice. After these criteria have been applied, the prize will go to the player who has scored the highest number of goals.

<table>
<thead>
<tr>
<th>player</th>
<th>no. of years in a team</th>
<th>no. of times late for training</th>
<th>no. of times missed two consecutive training sessions</th>
<th>no. of penalty kicks taken</th>
<th>no. of penalties scoring a goal</th>
<th>total no. of goals scored</th>
</tr>
</thead>
<tbody>
<tr>
<td>David</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>16</td>
<td>13</td>
<td>32</td>
</tr>
<tr>
<td>John</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Colin</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>13</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Mike</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td>Graham</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>36</td>
</tr>
</tbody>
</table>

Which player will receive the best all-round performance prize?

A  David
B  John
C  Colin
D  Mike
E  Graham
The diagram below shows the net of a cube.

The following diagrams show five suggested views of the cube once it has been assembled.

Which two of the above are possible views of the cube?

A  1 and 2
B  2 and 3
C  3 and 4
D  1 and 4
E  4 and 5
9 The plethora of house-buying and relocation programmes on television these days may well stimulate an interest in lovely properties, but they are a bad thing because at the same time they make viewers who could never afford the houses shown feel both envious and worthless.

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

A People who watch house-buying programmes do not tend to have nice houses themselves.
B Seeing others enjoy luxuries that they have not got can motivate people to work harder to earn enough to support the same lifestyle.
C The public thinks a celebrity lifestyle must be great, but most celebrities are constantly worried about dropping out of the public eye.
D It is said that renting property is throwing money away, but so much of what one pays monthly on a mortgage goes on interest anyway that many people find it better to rent rather than buy.
E Magazines that show images of men and women who seem perfect are largely to blame for our discontent and for the increase in eating disorders among young people.

10 Long-term unemployment is a big problem for the UK, both for the government and for the individual. The solution is unlikely to be one the government wishes to consider: invest money in improving the skills of job centre staff. Some people argue that providing welfare benefits makes unemployed people less motivated to find work. Other people, mostly outside the government, think that not enough is done to provide the help needed to get people into work. Neither side is right. Unemployed people are all different: some really want to work and would do so if they had help; others are content to live on benefits. We have to steer away from one-size-fits-all solutions and tailor the approach to the individual. But this needs much higher levels of skilled staff than job centres currently have.

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

A Long-term unemployment is one of the biggest problems facing the UK.
B Unemployed people vary in their motivation to work.
C One-size-fits-all solutions tend to be cheaper than tailored approaches.
D The way to reduce unemployment is to spend on skilled staff in job centres.
E Welfare benefits provide a disincentive to work.
Children spend far too long in schools analysing poems when they should simply be learning to enjoy them. Thankfully, a new approach requires that, instead of focusing on analysing technical aspects of writing such as the writer’s use of imagery or alliteration, children will be required simply to learn poems so that they can recite them by heart. This makes good sense. What is the use of learning how to analyse literature if you have no appreciation of its actual value? If they then become interested in it enough to study it at A level or at university, that can be when they learn to analyse in detail the author’s craft.

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

A  Analysing the writer’s craft could enhance the appreciation of the poem.
B  Children are not currently required to learn poems off by heart.
C  English will continue to be a subject available for study at A level or university.
D  For something to be classed as poetry it must include either alliteration or imagery.
E  Learning a poem off by heart will enable you to appreciate it more.

Recently, packets of Amblers crisps have had ‘money-off’ coupons inside them. Some coupons are worth 9p, some are worth 14p and some are worth 20p.

George has been collecting these coupons. He has more 14p coupons than 9p coupons, and more 9p coupons than 20p coupons. The total value of all of his coupons is exactly £1.50.

How many coupons has George collected?

A  9
B  10
C  11
D  12
E  13
Joanne is studying the period 1900–1950 and has decided to buy a new book to help with her studies. There are five different books available at her local bookshop, the details of which are summarised below:

<table>
<thead>
<tr>
<th>title</th>
<th>period covered</th>
<th>hardback?</th>
<th>illustrated?</th>
<th>price</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of the 20th Century</td>
<td>1900–2000</td>
<td>yes</td>
<td>no</td>
<td>£45</td>
</tr>
<tr>
<td>The Illustrated Guide to History</td>
<td>1750–2000</td>
<td>no</td>
<td>yes</td>
<td>£50</td>
</tr>
<tr>
<td>Beginner’s Guide to History</td>
<td>1700–1850</td>
<td>no</td>
<td>no</td>
<td>£40</td>
</tr>
<tr>
<td>History for All</td>
<td>1750–1950</td>
<td>yes</td>
<td>yes</td>
<td>£60</td>
</tr>
<tr>
<td>All About History</td>
<td>1800–1900</td>
<td>yes</td>
<td>no</td>
<td>£55</td>
</tr>
</tbody>
</table>

On Tuesday, Joanne chose to buy the cheapest book that would satisfy her requirements, and went away to get the exact amount of money needed to buy it. When she returned the following day to buy her chosen book she found that there was a sale and all of the books had been reduced by 20%. She then decided instead to buy the most expensive book that she could with the money she had, and which still satisfied her requirements.

How much money did Joanne have left over once she had bought the book?

A  £0
B  £1
C  £2
D  £3
E  £5
Connem Ltd. has recently adopted a new company logo.

A large plastic version of the logo has just been delivered to the office, to be attached to the outside of the building. Unfortunately, in transit, the plastic has broken into two pieces, as shown below:

Which one of the following could not be Connem’s new logo?

A  
B  
C  
D  
E
15 The financial circumstances of many young people make it difficult for them to forego paid employment for an extended period in order to undertake unpaid internships or work experience placements. In many industries, it is unlikely that a young person will gain entry-level paid employment unless he or she has held one of these temporary unpaid positions. Therefore, the current system of unpaid internships creates an unfair advantage for individuals from more affluent backgrounds.

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

A Unpaid internships and work experience placements often provide young people with an important opportunity for gaining references.
B The highest proportion of unpaid internships and work experience placements are based in a few central locations, such as London.
C Unpaid internships and work experience placements come in various lengths of duration from one to two days up to a number of months.
D Some young people find themselves moving from one unpaid position to another without being able to land a paid job.
E Some schools and other organisations have programmes in place to help match young people with internships or work experience placements.

16 Welfare benefits create a culture of dependency and an unproductive workforce. There are people who stay on welfare benefits for years and never look for employment. Two years ago the government introduced tougher restrictions on the eligibility to receive benefits and the number of recipients has now fallen by 20%. The government should therefore toughen these restrictions even more to further reduce the number of welfare claimants.

Which one of the following identifies the flaw in the above argument?

A It rests on the false assumption that people are happy to stay on benefits and not look for work.
B It gives the impression that the benefits are undeserved.
C It ignores the possibility of other causes for the fall in the number of welfare recipients.
D It equates the recipients of benefits with an unproductive workforce.
E It implies that welfare recipients are in this situation due to their own fault.
It has emerged that prisoners have helped to maintain one of Britain’s busiest railway lines. Inmates from an open prison have worked night-shifts on the main line from London to Glasgow. This is the same line where a train left the tracks earlier this year, killing one person and injuring several others. It is all very well to have offenders being rehabilitated through work, but what appears to be happening here is that rail contractors are cynically using prisoners as cheap labour. This is unacceptable, not just for safety reasons – important as they are – but because ultimately it is an infringement of workers’ rights. If these prisoners are being paid less, or treated differently from regular workers, the practice must stop once and for all.

Which one of the following expresses the general principle that underlies the above argument?

A  Labour is labour and should have the same value whoever is performing it.
B  Public safety issues must always be given priority over economic advantages.
C  Rehabilitation should be for the prisoner’s benefit, not the employer’s.
D  Prisoners who are given work should not take jobs away from other workers.
E  Maintenance of public services should be in the hands of skilled professionals only.

In the main draw of a lottery, six of the balls (which are numbered from 1 to 49) are selected at random, then the numbers chosen are rearranged and displayed in ascending numerical order. For instance: 3 17 20 29 34 45

In one draw recently, I noticed that the six numbers were made up of a total of ten digits, all different. The lowest number on this occasion was 1 and the highest number was 49, so the range of the six numbers was 48, the greatest possible range for the lottery main draw.

What is the smallest possible range when the six numbers in the main draw of the lottery have a total of ten digits, all different?

A  21
B  23
C  27
D  31
E  32
Car parking charges are shown in the table below. Brian wants to park his car for a period of 7.5 hours, whilst he is at work. He buys a ticket in the morning when he arrives at the car park. Due to the close proximity of the car park to his place of work, he is able to return to his car to buy a new ticket as many times as needed.

<table>
<thead>
<tr>
<th>up to</th>
<th>car parking charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>£0.80</td>
</tr>
<tr>
<td>2 hours</td>
<td>£1.20</td>
</tr>
<tr>
<td>3 hours</td>
<td>£1.70</td>
</tr>
<tr>
<td>4 hours</td>
<td>£2.40</td>
</tr>
<tr>
<td>5 hours</td>
<td>£3.50</td>
</tr>
<tr>
<td>6 hours</td>
<td>£4.20</td>
</tr>
<tr>
<td>7 hours</td>
<td>£5.20</td>
</tr>
<tr>
<td>8 hours</td>
<td>£6.20</td>
</tr>
<tr>
<td>over 8 hours</td>
<td>£8.20</td>
</tr>
</tbody>
</table>

What is the most Brian can save by returning to the car to buy new tickets compared to buying one 8-hour ticket?

A £1.10
B £1.40
C £1.60
D £2.10
E £3.60
Here is a diagram of a cube.

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

1 2 3

A 1
B 2
C 3
D 4
E 5
21 Charities address the negative effects of market economies, which apportion goods to people based on their ability to pay as opposed to their needs. The work of charities conceals the true impact of the market system and, worse, leaves the market in place to produce further negative outcomes. Charities therefore effectively perpetuate the problems the market system creates. Since it is immoral to support a practice that perpetuates the very problems it is supposed to resolve, giving to charity cannot be morally justified. After all, if the effects of a system are morally wrong, then it is immoral to sustain that system.

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

A Charity does not address the cause of the problem.
B Charitable giving is necessary because of the market system.
C Charities perpetuate the negative effects of market economies.
D Giving to charity is immoral.
E Charities conceal the negative effects of the operation of the market.

22 There is an automatic photograph booth in my local shopping centre. It takes exactly 2 minutes from the time that the money is inserted for the photographs to be taken, then the developed photographs appear 4 minutes later.

Money may only be inserted when the green light is on. This light goes out immediately after money is inserted, and comes back on again exactly 3 minutes later.

This morning, I arrived at the booth just as it was being switched on, and I was sixth in the queue. The first person inserted their money immediately, and the rest of us all inserted our money as soon as we were allowed to.

How long after I arrived at the booth did I insert my money?

A 15 minutes
B 18 minutes
C 21 minutes
D 25 minutes
E 30 minutes
23 A group of drivers, consisting of 200 women and 300 men, was asked if they passed their driving test at the first attempt.

Altogether 167 of the group said they passed at the first attempt.

Of the women, 143 said they did not pass at the first attempt.

How many of the men said they passed at the first attempt?

A 10
B 24
C 33
D 57
E 110
F 133
G 157

24 A cuboid has sides of length $x$, $\sqrt{2}x$ and $2x$, measured in cm.

The volume, in cm$^3$, of the cuboid is numerically equal to twice the total surface area, in cm$^2$, of the cuboid.

What is the value of $x$?

A 10
B $6 + 2\sqrt{2}$
C 5
D $3 + \sqrt{2}$
E $\frac{5}{2}$
F $\frac{3}{2} + \frac{1}{2}\sqrt{2}$
25 The line joining the points with coordinates \((p, p - 1)\) and \((1 - p, 2p)\) is parallel to the line with equation \(2x + 3y + 1 = 0\). What is the value of \(p\)?

A \(-1\)

B \(-\frac{1}{7}\)

C \(\frac{1}{9}\)

D \(\frac{1}{8}\)

E \(1\)

F \(\frac{5}{4}\)

G \(2\)

H \(5\)
A rectangle $PQRS$ is drawn inside a circle, with its vertices on the circumference of the circle.

The ratio of the length of $PQ$ to the length of $QR$ is $2 : 1$.

The area of the rectangle $PQRS$ is $96 \text{ cm}^2$.

What is the radius, in cm, of the circle?

A $\sqrt{6}$
B $3$
C $3\sqrt{2}$
D $2\sqrt{15}$
E $4\sqrt{6}$
F $12$
G $12\sqrt{2}$
H $8\sqrt{15}$
The expected number of bottles of water sold in a day at a sports ground is directly proportional to the square of the average outside temperature, in degrees Celsius, for that day.

On a day when the average outside temperature is 16°C, 64 bottles of water, the expected number, are sold.

On a warmer day, when the average outside temperature is $T$°C, 256 bottles of water are sold, which is 31 bottles more than the expected number for that day.

What is the value of $T$?

A  7.5
B  $\sqrt{450}$
C  30
D  32
E  $\sqrt{1148}$
F  56.25
At a cinema, drinks are sold in regular and large sizes.

The cups for these are mathematically similar.

The ratio of the heights of the cups and the ratio of the depths of the drinks are both 4 : 5

The volume of drink in a regular size cup is $320 \text{ cm}^3$.

What is the volume, in $\text{cm}^3$, of drink in a large size cup?

A 384
B 400
C 500
D 576
E 625
F 640
29 The straight lines

\[ 5x + 2y = 20 \]
\[ y = 3x - 23 \]
\[ x = 0 \]

enclose a region with area \( K \) square units.

What is the value of \( K \)?

A 39  
B 78  
C 99  
D 129  
E 198  
F 258

30 A scale model of a cylindrical pillar is to be made.

The full-sized pillar has a volume of \( 12\pi \text{ m}^3 \).

The model will use a length scale of 1 : 40

The model is to be a solid cylinder made of a plastic which has a density of \( \frac{4}{3} \text{ g cm}^{-3} \).

What is the mass of the model in grams?

A \( \frac{9}{640}\pi \)  
B \( \frac{1}{40}\pi \)  
C \( 40\pi \)  
D \( \frac{1125\pi}{8} \)  
E \( 250\pi \)  
F \( 10000\pi \)  
G \( 225000\pi \)  
H \( 400000\pi \)
PQRST is a regular pentagon.

RSU is an equilateral triangle.

What is the size of angle STU?

A  48°
B  54°
C  60°
D  66°
E  84°
The original price of an item is \( p \)

The price is **increased by** 125%

The increased price is then **decreased by** 40% to \( q \)

The relationship between \( p \) and \( q \) can be expressed as \( mp = q \)

What is the value of \( m \)?

A \( \frac{7}{20} \)

B \( \frac{17}{20} \)

C \( \frac{27}{20} \)

D \( \frac{33}{20} \)

E \( \frac{37}{20} \)

---

Q is 5 km away from \( P \) on a bearing of 065°

R is 5 km away from Q on a bearing of 155°

What is the bearing of \( P \) from \( R \)?

A 070°

B 110°

C 225°

D 270°

E 290°

F 315°

G 335°
The line segment $RT$ is a tangent at the point $S$ to a circle with centre $O$

$Q$ and $P$ are points on the circumference of the circle such that $QS = QP$

Angle $PST = 75^\circ$

What is the size of angle $QSO$?

A $15^\circ$

B $30^\circ$

C $37.5^\circ$

D $45^\circ$

E $52.5^\circ$

F $60^\circ$

G $67.5^\circ$

H $75^\circ$
The vertical height $h$ cm of an isosceles triangle is 3 cm longer than the base length of $b$ cm.

The sloping side is of length $s$ cm.

The area of the triangle is $14$ cm$^2$.

There is one value of $s$ which satisfies these conditions.

Within which range does this value of $s$ lie?

A  $5 < s < 6$

B  $6 < s < 7$

C  $7 < s < 8$

D  $8 < s < 9$

E  $9 < s < 10$

F  $10 < s < 11$
The first five terms of a sequence in order are:

\[ 2 \quad 17 \quad 42 \quad 77 \quad 122 \]

The \( n \)th term of this sequence is \( pn^2 + q \) where \( p \) and \( q \) are integers.

What is the value of \( \frac{p-q}{p+q} \)?

A \( \frac{1}{4} \)

B \( \frac{1}{2} \)

C 1

D \( \frac{23}{17} \)

E \( \frac{13}{7} \)

F 2

G 4

H 14
A bag contains 6 red and 6 green sweets. The sweets are identical apart from their colour.

A child takes a sweet at random from the bag.

If the sweet is red, the child stops taking sweets.

If the sweet is green, it is not replaced and the child takes another sweet.

This continues until a red sweet is taken at which point the child stops taking sweets.

What is the probability that the child takes more green sweets than red sweets?

A \[ \frac{3}{22} \]

B \[ \frac{5}{22} \]

C \[ \frac{3}{11} \]

D \[ \frac{1}{2} \]

E \[ \frac{8}{11} \]

F \[ \frac{17}{22} \]
Sickle cell anaemia is a recessive genetic condition that results in abnormally-shaped red blood cells due to the production of a faulty type of haemoglobin. Children born with sickle cell anaemia rarely live to adulthood without significant medical intervention. Carriers, who only have one copy of the sickle cell allele, have greater resistance to the disease malaria than people with two copies of the allele for normal functional haemoglobin.

Using this information, which of the following statements is/are correct?

1. People with sickle cell anaemia would have reduced anaerobic respiration in their muscle cells.
2. In areas with malaria the percentage of people surviving with sickle cell anaemia increases.
3. In parts of Africa where malaria is more common you would expect to find more people with a sickle cell allele.

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
A student studied this photograph of part of an organ.

The student drew the following conclusions about the two cells labelled X and Y.

1. Both cells X and Y are found in the same tissue.
2. Both cells X and Y were produced by mitosis.
3. Both cells X and Y have a cell wall.

Which of these conclusions is/are correct?

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
A student investigated the tadpole population in a large pond.

A net with a rectangular opening measuring 0.1 m × 0.2 m was swept through the water for a fixed distance of 1 m. This was repeated 10 times.

All the sweeps were made at the edge of the pond as the student had no waders or boat.

The number of tadpoles in each sweep was recorded in the table.

<table>
<thead>
<tr>
<th>sweep number</th>
<th>1</th>
<th>2</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of tadpoles</td>
<td>20</td>
<td>12</td>
<td>32</td>
<td>0</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

The student made the following statements.

1. Each sweep sampled 0.02 m³ of water.
2. The frequency of occurrence of the tadpoles was 90%.
3. An accurate estimate of the population size of tadpoles in the pond could be calculated using this data if the total volume of water was known.

Which of the statements about the investigation is/are correct?

A none of them
B 1 only
C 2 only
D 3 only
E 1 and 2 only
F 1 and 3 only
G 2 and 3 only
H 1, 2 and 3
A breeding experiment was carried out using rats.

A pair of rats has eight offspring per litter. The offspring breed freely amongst each other within the same generation. Each female is only allowed to have one litter of eight.

The expected ratio of male to female offspring in this breeding population is the same in rats as in humans, and is seen in every generation.

In the 4th generation of offspring, how many individuals would be expected to have the XY genotype?

A 16
B 32
C 64
D 128
E 256
F 512
G 1024
The diagram shows four steps in the process of human sperm production. For each step only one complete division takes place.

Assuming no mutations and that all of the cells survive, what will be the maximum number of haploid cells originating from a single early spermatogonium?

A  1
B  2
C  8
D  16
E  32
F  64
43 Which of the following conditions is/are required by the cells near the tip of a plant shoot in order for the tip to grow towards light from one direction?

1 sufficient glucose
2 uneven distribution of plant hormone
3 sufficient oxygen

A none of them
B 1 only
C 2 only
D 3 only
E 1 and 2 only
F 1 and 3 only
G 2 and 3 only
H 1, 2 and 3

44 A cell from the epithelium of an animal was removed. The cytoplasm of this cell can be considered as a 2% sugar solution. The living cell was placed in a 4% sugar solution.

Which of the following statements is/are correct?

1 At equilibrium, the sugar concentration in the cell was 6%.
2 Water continued to move across the cell membrane after equilibrium was reached.
3 Osmosis was most rapid when the cell was first placed in the solution.

A none of them
B 1 only
C 2 only
D 3 only
E 1 and 2 only
F 1 and 3 only
G 2 and 3 only
H 1, 2 and 3
A piece of DNA is made up of two complementary strands, each 25 bases long.

14% of the bases are adenine.

Which two statements are correct?

1. Adenine and cytosine together make up 25 bases.
2. Adenine and guanine together make up 50% of the bases.
3. There are 14 thymine bases present.
4. 36 of the bases are guanine.

A. 1 and 2 only
B. 1 and 3 only
C. 1 and 4 only
D. 2 and 3 only
E. 2 and 4 only
F. 3 and 4 only
In a laboratory, the activity of two lipase enzymes on the same type of lipid was studied. One lipase enzyme was produced from a mutation in the gene that coded for the original enzyme. The mutation occurred in the sequence for three adjacent amino acids called serine, aspartic acid and histidine. The graph shows the results of this study.

**Key**
- **- - -** mutated lipase
- **- - -** lipase

Which of the following statements is/are correct?

1. The serine, aspartic acid and histidine amino acids could be in the active site of the enzyme.
2. All mutations affecting the region coding for serine, aspartic acid and histidine amino acids will be expected to have the same effect.
3. At point Q on the graph, the pH of the reaction mixture will be higher than at P.

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
The family tree shows a family affected by a dominant genetic condition. All people who carry the mutation show symptoms of the condition.

Which of the following statements could explain the presence of the dominant condition in female R?

1. The mutation occurs in P.
2. The mutation occurs in Q’s father.
3. The mutation occurs in R.

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
Dolly the sheep was born in 1996. She was unusual because she had no biological father.

The diagram shows how she was produced.

![Diagram of Dolly's production process]

Which of the following processes had to occur to produce Dolly?

1. genetic engineering
2. mitosis
3. meiosis
4. differentiation

A. 1 and 2 only
B. 2 and 3 only
C. 1, 2 and 4 only
D. 1, 3 and 4 only
E. 2, 3 and 4 only
A student investigated the rate of oxygen bubble release from a pondweed plant at different temperatures. The rates are shown below, with two sections of the graph marked X and Y. In each investigation all other factors were kept constant.

Which of the following statements about sections X and Y is/are correct?

1. In section X, the kinetic energy of the reaction molecules is increasing with increasing temperature.
2. In section Y, temperature is the factor which limits that rate of oxygen production.
3. In section Y, the plant’s enzymes may have denatured.
4. Section Y represents the plant’s maximum possible rate of oxygen production under any conditions.

A 1 only
B 2 only
C 3 only
D 4 only
E 1 and 2 only
F 1 and 4 only
G 2 and 3 only
H 3 and 4 only
A student analysed a gene sequence that had been identified in four different types of organism. The gene codes for a functional protein. A section of the gene’s DNA is shown below. The rest of the DNA from this gene (not shown) is identical in all four different types of organism.

<table>
<thead>
<tr>
<th>organism</th>
<th>DNA sequence</th>
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<tbody>
<tr>
<td>human</td>
<td>ACG CCT CGT CAC GCT AAA</td>
</tr>
<tr>
<td>oak tree</td>
<td>ACG GAA TAT GTA GCT AAA</td>
</tr>
<tr>
<td>mushroom</td>
<td>ACG GAA CTC TTA GCT AAA</td>
</tr>
<tr>
<td>E.coli bacterium</td>
<td>ACG TAC GAT GGG GCT AAA</td>
</tr>
</tbody>
</table>

The student then made the following conclusions:

1. This gene does not code for chlorophyll.
2. This gene may be found in the nucleus or cytoplasm.
3. The protein that this gene codes for is likely to be more similar in plants and fungi than in the other organisms.

Which of these conclusions is/are correct?

A none of them
B 1 only
C 2 only
D 3 only
E 1 and 2 only
F 1 and 3 only
G 2 and 3 only
H 1, 2 and 3
The graphs represent the changes in the mass of a healthy human body cell and in the mass of the DNA of that cell over time.

Using the graph, which of the following statements is/are correct?

1. Mitosis takes place at 12 and 36 hours.
2. The graph shows two cell divisions.
3. The next cell division should take place at 72 hours.

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
Bt pesticide is used by farmers to kill insect pests. However, widespread use has resulted in the evolution of resistance to this pesticide. A recessive allele causes resistance.

Scientists have suggested that in areas where the Bt pesticide is used, a small number of fields are left untreated. These untreated fields are known as *refugia*. This method has been shown to slow down evolution of resistance to the pesticide.

Which of the following statements explain why refugia could slow down the evolution of resistance to Bt pesticide?

1. When resistant insects breed with pesticide-sensitive insects that do not have the allele for resistance, the offspring produced will be sensitive to the pesticide.

2. When fewer insects are exposed to pesticide, fewer mutations occur that produce alleles for resistance.

3. The refugia help to maintain genetic variation in the population of insect pests.

A. none of them
B. 1 only
C. 2 only
D. 3 only
E. 1 and 2 only
F. 1 and 3 only
G. 2 and 3 only
H. 1, 2 and 3
PART C Reading Comprehension

For part C, you will need to refer to the separate text booklet.
 Task 1

Look at the two texts on page 3. For questions 53 – 58, choose the option (A, B, C or D) which you think fits best according to the texts.

53 Review Extract One explains that tropical islands were useful to the development of European environmental thought because they

A were of a size that limited the scale of problems introduced to them via colonisation.
B featured ecological regimes not already affected by human settlement pre-colonisation.
C had features which made certain impacts of colonisation particularly visible.
D remained largely isolated from most European influences even post-colonisation.

54 The views of the historians referred to in Review Extract One suggest that pre-colonial tropical island societies

A lacked the capacity to resist invasion by the colonisers.
B were more accustomed than Europeans to difficult natural environments.
C consumed fewer natural resources than did the European colonisers.
D were unable to contribute to theoretical enquiry about environmental matters.

55 According to Review Extract One, Grove’s viewpoint on the effects of colonialism is ‘more nuanced’ in that he

A challenges certain beliefs about the expansion of western science into other societies.
B acknowledges the impact of tropical island cultures and environments on European thought.
C questions the degree of harmful change enacted by the colonisers.
D focuses on the views of the indigenous populations on islands colonised by Europeans.
56 The author of Review Extract Two refers to British agricultural developments to make the point that Grove overlooks

A the potential significance of European issues and events in the shaping of environmentalism.

B the new solutions to environmental problems suggested by the experience of native tropical islanders.

C the growing importance of agricultural practices in the evolution of environmental thinking.

D the methodological problems associated with a study covering such a lengthy period of European history.

57 The author of Review Extract Two suggests that ‘Grove’s tropical scientific experimenters’

A were more comfortable with the non-European cultures found on the tropical islands.

B did not gain insights useful for the advancement of an environmental perspective.

C over-emphasised the relevance of the ‘edenic’ in environmental thinking.

D were not key figures in other major European-based circles of thought.

58 Which review extract or extracts indicates that Grove has taken a relatively original approach within his study?

A Neither review extract

B Both review extracts

C Review Extract One only

D Review Extract Two only
Task 2

Look at the four texts on pages 4 – 5. For questions 59 – 66, choose the option (A, B, C or D) which you think best answers the questions.

59  Which writer mentions a limitation which affected an investigation of mathematical beauty?

60  Which writer gives a broad overview of certain attempts to exploit mathematical beauty?

61  Which writer highlights the fact that finding order out of chaos is not the only aspect of mathematical beauty?

62  Which writer says that expressing a particular mathematical notion in physical form would not do justice to it?

63  Which writer says that a visual representation of mathematics can produce a moment of illumination?

64  Which writer includes the idea that mathematics is beautiful when it sheds light on the biggest scientific questions?

65  Which writer suggests that academics do not proclaim the notion of mathematical beauty?

66  Which writer implies that for most people the high cognitive element in mathematics would obstruct any notion of mathematical beauty?
PART C Reading Comprehension

Task 3

Look at the text on pages 6 – 7. For questions 67 – 76, choose the answer (A, B, C or D) which you think fits best according to the text.

67 In the context of paragraph 1, ‘reasons’ has the meaning of

A causes.
B explanations.
C motives.
D justifications.

68 What is the main point that the author makes about actions in paragraph 1?

A Agents are not always responsible for the consequences of their actions.
B Actions must be interpreted according to their consequences as well as their reasons.
C If an action is well intentioned there are no grounds for blame or need for apology.
D Agents cannot know in advance how their actions will affect others.

69 In paragraph 2, the writer suggests that

A without our shared experience of consequences we could not understand the private reasons people have for their actions.
B without communication skills it would not be possible to convey the intentions behind our bodily behaviour.
C without a satisfactory account of actions we fail to take the agent’s point of view into consideration.
D without a proper explanation for our own bodily behaviour we cannot explain our reasons for actions.
70 The author introduces a reference to game theory

A to illustrate a distinction between causes and effects.
B to demonstrate the ethical value of consequentialism.
C as a useful analogy for real-life situations.
D as an example of consequentialism in practice.

71 The main point that the author is making in paragraph 4 is that

A people may act for different reasons in different circumstances.
B the nature of consequences makes them simpler to deal with than reasons.
C despite its problems, consequentialism is the only valid form of evaluation.
D the problem with reasons is that it is often difficult to distinguish between them.

72 In paragraph 5 it is stated that for a serious consequentialist,

A people are accountable for their actions even after they are dead.
B an important ethical question concerning action disappears.
C the alleviation of worldwide suffering is no single person’s responsibility.
D there is a subtle difference between doing something and doing nothing.
73 The example in paragraph 6 of medical research and equipment is meant to draw attention to

A the feeling of guilt that comes from inaction.
B the responsibility we feel towards those in need.
C the fact that our resources are finite.
D the claim that actions are essentially goal-directed.

74 Judging by paragraph 6, the author thinks that the doctrine of unlimited negative responsibility

A is a recipe for inactivity.
B derives from a prevailing sense of guilt.
C has no moral justification.
D is inconsistent with consequentialism.

75 The main point put forward in paragraph 7 is that

A bringing happiness to a limited number is a good thing to aim for.
B the welfare of all of humanity should not be our sole moral preoccupation.
C there is no virtue in depriving one’s children to maximise charitable giving.
D it is better to give money to those in need than to spend it selfishly.

76 In paragraph 7, the author concludes that the real contrast is between

A legitimate spending on one’s family and the need to give to charity.
B spending that has genuine value and spending that does not.
C unlimited negative responsibility and ordinary kindness.
D feelings of moral obligation and a desire to make people happy.
INSTRUCTIONS TO CANDIDATES

Some words and phrases are shaded in the texts as they are referred to in some questions.

Please wait to be told you may begin before turning this page.
Task 1

Read the two adapted extracts below, which are taken from reviews of Richard Grove’s *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860.*

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**REVIEW EXTRACT ONE**

*Jane Carruthers*

In this book, Grove diverts the field of environmental history from a too-customary North American focus and gives attention to other parts of the globe whose history has been more recently shaped by the colonial experience. Using insights from postmodern literary theory, resource economics and other disciplines, Grove traces the origins of modern environmental concern to European expansion in general, but especially to contact with tropical islands and their plant and animal species. Being isolated and relatively small, the tropical islands rapidly and dramatically demonstrated the mechanisms and processes of ecological change brought about by European penetration, thus generating theoretical enquiry about such matters. While some historians consider imperialism to have been totally detrimental to colonial environments by disrupting pre-colonial ecologies and by aggressive resource extraction, Grove presents a more nuanced view. He sees the course of environmentalism as a two-way process, observing it not only from a colonial perspective but also in terms of how that perspective was shaped by the different climates and ecological regimes encountered by the colonizers. Much of what today is referred to as indigenous knowledge, Grove shows, was not ridden over roughshod by colonizers, but indeed permeated western science.

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**REVIEW EXTRACT TWO**

*Bill Luckin*

Focusing on the multiple meanings of the ‘edianc’ and the ‘newly discovered’ non-European world between 1600 and the mid-nineteenth century, Grove makes convincing connexions between the ways in which British, Dutch and French men of science were able to draw on everyday experience and specialist knowledge of remote islands to build up an understanding of the potential fragility and exhaustability of nature. Over-playing the edenic theme, however, Grove devotes too little attention to possible alternatives to scientific fascination with island milieux as major determinants of emerging global environmentalism. Thus, it would have been revealing to have juxtaposed structural similarities and dissimilarities between agricultural intervention in eighteenth-century Mauritius against analogous developments of enclosure and agrarian improvement in Britain between 1750 and 1815. Such a comparison might have convinced sceptical readers that Grove’s tropical scientific experimenters really were more influential than Eurocentric ideologues and cultural critics in preparing opinion in England and France in particular for the possibility that ‘progress’ might generate severe, socially disruptive environmental disequilibria. Instead, Grove’s reluctance to trace ideological and intellectual connexions between broader Enlightenment and post-Enlightenment discourses weakens the thrust of his study as he moves from the eighteenth into the mid-nineteenth century.

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1 edenic: evoking a sense of the unspoilt or idyllic
Task 2

Read the four extracts below, which give the views of four writers on the beauty of maths.

A Justin Mullins

The philosopher and logician Bertrand Russell famously claimed that mathematics has ‘a beauty cold and austere, like that of sculpture’. Sculpture, indeed, is widely admired in our societies, but mathematical beauty is barely recognised beyond the confines of the ivory towers of scholars and even by them is never celebrated. This seems curious because it is clear that artists have long found inspiration in mathematics, from Ancient Greek architects using ‘the golden ratio’ when designing the Parthenon, through Da Vinci’s linking of human beauty and geometry in *Vitruvian Man* to modern-day computer graphics of fractal patterns.

But mathematicians are not normally thinking of images, models and sculptures when they talk about beauty. Mathematical beauty is not so much visual quality: the generally accepted view is that it involves employing a minimal number of assumptions, or gives some original and important insight, or throws other work into new perspective. The most famous example of a function that meets all these requirements is Euler’s formula $e^{ix} = \cos x + i\sin x$ which links together fundamental mathematical concepts and draws together geometry, the study of space, and algebra, the study of structure and quantity. I have never seen an ‘artistic’ model of Euler’s formula, but it would be impossible to get a sense of the function’s power and majesty from such a thing.

B Semir Zekil et al

Art and mathematics are, to most, at polar opposites; the former has a more ‘sensible’, perceptually-based source and is accessible to many while the latter has a strongly intellectual source and is accessible to few. Yet both can provoke the aesthetic emotion and arouse an experience of beauty, although neither all great art nor all great mathematical formulations do so. Plato thought that ‘nothing without understanding would ever be more beauteous than with understanding,’ making mathematical beauty, for him, the highest form of beauty.

The premium thus placed on the faculty of understanding when experiencing beauty creates both a problem and an opportunity for studying the neurobiology of beauty. Unlike our previous studies of the neurobiology of musical or visual beauty, in which participating subjects were neither experts nor trained in these domains, in the present study we had, of necessity, to recruit subjects with a fairly advanced knowledge of mathematics and a comprehension of the formulae that they viewed and rated.
When mathematical patterns or processes automatically generate art, a surprising effect can occur: the art often clarifies the mathematics. Who could have guessed the mathematical nuggets that might otherwise be hidden in a torrent of symbolic or numerical information? At a basic level, the process of coloring the numbers resulting from some formula, for example, allows the information to take on a visual shape that provides identity and recognition. Who could guess the shape or the marvellous symmetry of an algorithmically produced fractal?

Sometimes the beautiful clarification of mathematics can be a serendipitous outcome of art created for other reasons. But equally there are examples in which the artist's main purpose is to express, even embody mathematics. Several prints by M.C. Escher are the result of his attempts to visually express such mathematical concepts as infinity, duality, dimension, recursion, topological morphing, and self-similarity.

However, patterns and forms that are the ‘automatic’ product of purely mathematical processes are usually so precise, symmetrical, mechanical or repetitive that they fail to hold the art viewer’s attention. They can be pleasing and interesting, and are fun to create but are mostly devoid of the subtlety, spontaneity, and deviation from precision that artistic intuition and creativity provide.

Almost all research mathematicians pepper their descriptions of important mathematical work with terms like ‘unexpected,’ ‘elegance,’ ‘simplicity’ and ‘beauty.’ Henri Poincaré (1854–1912), often described as a polymath, wrote, in his essay ‘Mathematical Creation’, that ignoring the subjective experience ‘would be to forget the feeling of mathematical beauty, of the harmony of numbers and forms, of geometric elegance. This is a true aesthetic feeling that all real mathematicians know, and surely it belongs to emotional sensibility.’ So what exactly is the source of mathematical beauty?

All aesthetic responses seem to come in part from identifying simplicity in complexity, pattern in disharmony, structure in stasis. But as pointed out in an article in The Economist (2005), we should also bear in mind that maths is useful, and that its utility depends in part on its certainty, and that that certainty cannot come without a notion of proof. Some argue that mathematical principles are experienced as ‘beautiful’ because they point directly to the fundamental structure of the universe. Physicist Max Tegmark argues further that the reason that mathematics works so well, and so elegantly, in physics is because the universe (or, more properly, the multiverse) is, ultimately, just mathematics.
Consequences and negative responsibility

1. Actions are two-faced. They are done by agents intentionally and are therefore expressive of what the agent has in mind. But they are also causes of effects in the public external world of events, and have consequences irrespective of whether they were intended or not. Actions typically both manifest reasons and bring about results. Both aspects of action are essential, but it is common for thinkers to concentrate on one to the exclusion of the other. Where blame is at issue, or apology called for, the agent thinks only of his intentions, and says ‘I didn't mean to’. The impersonal spectator, on the other hand, tends to discount the agent's perspective, and to consider actions solely in the light of their consequences, and hold people responsible for all the consequences of their action or inaction.

2. Either exclusion eviscerates the concept. If we think of actions solely as communications conveying the agent's intentions, we ignore the conditions which alone make communication possible. It is not just that the way to hell is paved with good intentions, but that there is a conceptual link between what is intended and what actually happens, and it is only in virtue of our sharing a common world of cause-and-effect that we can construe the bodily behaviour of another as expressing his intentions towards us. Equally, however, we fail to give an adequate account of actions if we try to see them simply as causes, and do not see them also from the agent's point of view, and ask ourselves what his reasons were for doing as he did.

3. Once we acknowledge that the consequences of actions count, it is tempting to adopt an entirely consequentialist position, in which the distinction between an action and its consequences ceases to signify, and each course of action is evaluated entirely and exclusively in the light of its consequences. Even if we admit that actions are not merely causes, it is very largely as causes that they are significant for us. The terminology of game theory strongly suggests that the payoffs, in terms of which outcomes are to be evaluated, are consequences, and most game theorists unwittingly assume a consequentialist outlook.

4. Consequentialism has many merits. It offers a unitary scheme of evaluation, which takes full account of the fact that consequences are important. Consequences are much more definite than motives or intentions: consequences are states of affairs, and it is moderately easy to distinguish between one state of affairs and another, and to decide which, if either, obtains. Reasons, by contrast, are much more indeterminate: often there is no way of telling what were the reasons behind a particular action. Although the scheme for evaluating states of affairs put forward by consequentialism runs into difficulties, states of affairs are the sort of thing that could be evaluated objectively, and often are. We often do take consequences into account in deciding what to do, and are able to assess their value, and it is not clear that there is anything else that could enter into our reckoning with equal validity and weight.
However, consequentialism has difficulties of time perspective. It is not clear when the consequences are to be evaluated: is it on the morrow of the action, or the following year, or in the long run when we are all dead, and everything will be much the same whatever we have done? An exclusive emphasis on consequences also obliterates the distinction, important in our ordinary moral thinking, between action and inaction. According to the consequentialist we are as much responsible for the consequences of what we do not do as for the consequences of what we do: if at any time I failed to alleviate sufferings in the remotest parts of the Third World, I am as responsible as if I had deliberately chosen to bring them about.

From a conceptual point of view such a doctrine of unlimited negative responsibility is flawed. It misconstrues the nature of action. To act is to focus on some end result and therefore away from others. I must keep my eye on the ball, and therefore turn a blind eye to other needs. If I am doing medical research, I ought not to sell my equipment to relieve immediate hunger. Negative responsibility is also a hard doctrine. It loads everyone with unassailable feelings of guilt. For that very reason, we sense, it must be wrong. I cannot be responsible for alleviating all the ills in the world. Moreover, an all-pervasive feeling of guilt is, in practice, counter-productive. What is the general responsibility of all becomes the responsibility of nobody in particular. And since, however much one does there will be countless tasks undone for which one will be blamed, it is tempting to just give in, and wallow with everybody in feeling bad without actually doing anything to make some things better.

In criticising the consequentialist's doctrine of unlimited negative responsibility, I do not maintain that nobody should have a wide-ranging concern for the general welfare of mankind, but merely reject the unbending Procrustian tenet that this is the only concern that any moral agent should have. Although that may be the vocation for some, for many it is a good vocation to make just a few people happy, as in family life. The man who gives his children only sardine sandwiches for Christmas, so as to give more to Oxfam, is not self-evidently doing right. One may even spend something on oneself. This is not to say that money should be spent on one’s family or oneself regardless of the needs of others, as it too often is. Many people are selfish and many devote their lives to the trivial and valueless, and it would be far better if they gave money and time to help their less fortunate fellow human beings. But that is a call for generosity, not an obligation arising from their being always responsible for every ill they could conceivably have prevented.
### Part A: Thinking Skills

|   | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   |
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**ALL candidates must complete Part A**
Part B: Mathematics and Biology

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Part C: Reading Comprehension

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Attempt either Part B or Part C but NOT both.
Psychological and Behavioural Sciences Admissions Assessment
Past paper 2018
Section 1
Answer key

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Thursday 31 October 2018

SECTION 2

Candidate number V

Centre number

Date of birth mm dd yy

First name(s)

Surname / Family name

INSTRUCTIONS TO CANDIDATES

Please read these instructions carefully, but do not open the question paper until you are told that you may do so. This paper is Section 2 of 2.

There are four questions in this paper, of which you should answer one.

You should write your answer in the space provided in this question paper. Please complete this section in black pen.

You can use the blank inside front and back covers for rough working or notes, but no extra paper is allowed. Only answers in the space indicated in the paper will be marked.

Dictionaries may NOT be used.

Please wait to be told you may begin before turning this page.

This question paper consists of 9 printed pages and 3 blank pages.
Choose one of the quotations below and use the space provided in this question paper to discuss it.

Your answer will be assessed taking into account your ability to think analytically, produce a coherent argument, and write with clarity and precision.

1. ‘There is nothing either good or bad but thinking makes it so.’  
   *Hamlet* from William Shakespeare (1564-1616)

2. ‘We are all now connected by the internet, like neurons in a giant brain.’  
   Stephen Hawking (1942-2018)

3. ‘We are all in the gutter, but some of us are looking at the stars.’  
   Oscar Wilde (1854-1900)

4. ‘The real voyage of discovery consists not in seeking new landscapes but in having new eyes.’  
   Marcel Proust (1871-1922)