Question 1
A Incorrect
Pulses are defined as edible legumes. Legumes are defined, in part, as plants that bear their seeds in pods. Thus, all pulses bear their seeds in pods.

B Incorrect
Legumes are defined, in part, as plants that have nodules on their roots. Thus, because lentils are edible legumes, lentils do have nodules on their roots.

C Correct
Clover has the characteristics of legumes (seeds in rows in pods and nodules inhabited by nitrogen-converting bacteria), but is not a pulse as it is not generally considered edible.

D Incorrect
Clover is a legume, and thus has bacteria that convert nitrogen from the atmosphere. There is no information about whether clover also removes nitrogen from the soil, nor whether clover could be considered ‘valuable’.

Question 2
In this question, it is important to recognise that not all set-ups are for a 24-hour light-dark cycle, allowing the hours of light and the hours of darkness to be varied independently.

A Incorrect
In two of the set-ups there were 10 hours of darkness. Spangled snapdragons did not flower in either of them.

B Correct
In two of the set-ups there were 9 hours of darkness. Spangled snapdragons flowered in both of them despite different periods of light, so it can be concluded that these conditions may have been the trigger for flowering. When compared to the other options, this is the most likely trigger.

C Incorrect
In three of the set-ups there were more than 14 hours of light. Spangled snapdragons flowered in the two setups with 9 hours of darkness but not in the set-up with 10 hours of darkness. This suggests that more than 14 hours of light is not, at least by itself, the trigger.

D Incorrect
There was only one set-up with less than 15 hours of light, and spangled snapdragons did not flower under these conditions.

Questions 3 and 4
This brief scenario describes a situation where a ten-year-old boy has been adopted. It seems that his birthmother has felt unable to control or help his tendency to light fires.

Question 3
A Incorrect
The adoptive mother does not exaggerate the seriousness of the incident. The fact that the boy lit several fires is serious. She handles this serious situation in a straightforward manner without exaggeration.

B Correct
The mother clarifies the incident by asking, ‘What did you do?’ She recognises its serious implications by encouraging the boy to put himself in the place of his birthmother, getting him to realise that she would have been scared and that she felt incapable of helping him: ‘she didn’t know how to give you the help you needed’.

C Incorrect
The adoptive mother directly addresses the incident of the fire, she does not overlook it. The final speech implies that the birthmother’s handing him to someone who could help him was an act of love – there is no suggestion that he was not in loving hands before.
D Incorrect
There is no absolution – nothing to suggest that the seriousness of the fire is downplayed and no suggestion that the birthmother should have prevented the fire-lighting.

Question 4
A Incorrect
There is no suggestion of breaking connections with the birthmother and there is no condemnation. The explanation given is supporting and approving.

B Incorrect
The adoptive mother stresses that the behaviour was bad and asks the boy to reflect on the consequences: ‘How do you think your birthmother felt...?’ There is no suggestion of looking at it in a more positive light.

C Correct
The adoptive mother believes that it is important for the boy to understand that he is responsible for his behaviour. There is no glossing over the fact that he set the fire(s) and that this was bad. Such a situation could have been interpreted by the boy as having been rejected by his birthmother because he had been so bad. However, the adoptive mother stresses that his birthmother wanted to help him but didn’t know how ‘she found a way to see that you had parents...’. It was certainly not a case of rejection.

D Incorrect
It is implied that the adoptive mother will be able to help the boy – that is why she has adopted him. So she won’t respond in the same way as the birthmother, who was unable to help him.

Question 5
In this sequence, note that the black and grey dots are present in each frame; the white dot is present in all but the 3rd frame. None of the three dots occurs in the same position twice. The simplest explanation of this pattern is that, between frames, the grey and black dots both move anticlockwise two corners (or clockwise three corners); the white dot moves clockwise two corners and is covered by the grey dot in the 3rd frame. Therefore, in the 5th frame, the grey dot should be in the upper right corner, the black dot should be in the upper left corner and the white dot should be in the upper left corner. The alternative that satisfies these conditions is D, and the white dot is covered by the black dot.

Question 6
In this pattern, note that each of the component lines of the figures occurs twice in each row and in each column. The simplest explanation is that the left and right columns combine to give the middle column, or that the middle and bottom rows combine to give the top row. Therefore, the missing frame must be a combination of the left and right frames of the middle row or, equivalently, the top frame minus the bottom frame of the middle column. The alternative that satisfies these conditions is C.

Question 7
In this set of frames, note that the grey oval remains in the centre, but its orientation changes (diagonal, horizontal or vertical). The clear ovals do not change orientation but each occurs in five different positions within the frame. The simplest explanation of this pattern is that, between frames, the grey oval rotates 45º anticlockwise, the horizontal clear oval moves from top to bottom through five equidistant positions, and the vertical oval moves from left to right through five equidistant positions. Therefore, the sequence is ADECB, and the answer is E.

Questions 8 - 11
These questions are based on an extract where a patient describes his experience of wanting pain relief after major abdominal surgery and finding that the doctor in charge has no empathy for his situation.

Question 8
A Incorrect
The pain is already bad – the patient repeated his request for pain killers. His concern is to relieve the pain he is already experiencing, not a concern that it will get worse.
B Incorrect
The patient initially hoped that the chief resident would minimise the pain, but this does not happen and the patient ends up making an exasperated comment: ‘Great, I’ll suffer . . .’. This certainly does not suggest confidence in the doctor.

C Incorrect
The patient’s concern is not that the doctor isn’t taking his pain seriously. If the doctor didn’t take the pain seriously, he might tell the patient not to make a fuss. The doctor takes the pain seriously – he does not deny it. He explains in some detail why he can’t provide pain killers. He says that he wants to use the pain as an indicator of the patient’s progress. The patient’s concern is that the doctor is not putting himself in the position of imagining what it would be like to have the pain.

D Correct
The patient feels powerless: ‘I agreed to all this . . . I seemed to have no choice’ We know that this is not what the patient wants: ‘I repeated my request for pain killers’. The patient’s final comment, ‘Great, I’ll suffer . . .’, provides evidence that he feels powerless, with no expectation that he can change the situation.

Question 9
A Incorrect
There is no attempt to convince the patient that he can cope with the pain; indeed, there is an offer to deaden the area of insertion, which might help alleviate pain a little, but it is not the patient’s central concern.

B Correct
The doctor explains how and why the pain is monitored in a certain way – it is an important indicator of what is going on. We are told that the doctor did this in some detail, respecting the patient’s request. A doctor might tell the patient not to worry, or some other response without explanation, but this doctor explains.

C Incorrect
There is no evidence that the doctor has addressed the patient’s fears and indeed the patient does not express fears as such, just a desire to be rid of the pain.

D Incorrect
There is no evidence that the doctor has emphasised the skill of doctors in avoiding painful procedures. In fact, he explains that the pain is needed so that symptoms can be monitored.

Question 10
A Correct
The patient is most concerned that he is, at that moment, experiencing pain. He has already asked for pain killers and repeats his request. He is thus most concerned that he will be expected to put up with the pain.

B Incorrect
The extract is about the patient’s experience of pain at the time. He does not express any wish to remember the pain. His final statement about not remembering pain is not intended literally and is spoken with sarcasm, criticising the doctor’s rationale of not remembering pain.

C Incorrect
The doctor suggests that pain is expected and is indeed helpful in monitoring progress, so the patient is not concerned that the pain indicates anything that is not a normal part of the procedure. The patient’s focus is on the fact that he is feeling pain, not on the consequences of the pain.

D Incorrect
The patient is angry about the fact that he will experience the pain at the time. At this point he is not concerned about the future.

Question 11
A Incorrect
The patient expresses no anxiety about the doctor’s qualifications.
The patient is experiencing pain, so his concerns won’t be alleviated by being told they are unwarranted, i.e. denying that his experience is valid.

The patient does not appear to be confused – he is in fact quite clear about the distinction between ‘experiencing’ and ‘remembering’.

The patient’s final remark, ‘that’s supposed to make it okay?’, suggests that he would have liked more time spent on having his feeling acknowledged and he would have appreciated a more detailed explanation from the doctor.

In this question, it can help to recognise that options B, C and D are essentially equivalent.

It is known that the boy and the girl support different teams. As they claim support for different teams, either both are telling the truth or both are lying (if only one of them is lying, their claims would mean that both support the same team). It is known that at least one of them is lying. Thus, they must both be lying.

If the boy is not lying, then the girl must be lying, as it is known that at least one person is lying. However, if the boy is telling the truth and the girl is lying, both the boy and the girl would support the same team – the Panthers. This is not possible, as it is known that they support different teams.

If the girl supports the Demons, then she is telling the truth. If she is telling the truth, then the boy must be lying as it is known that at least one person is lying. However, this would mean that the boy must also support the Demons. This is not possible, as it is known that they support different teams.

If the girl is telling the truth, then the boy is lying, as it is known that at least one person is lying. However, if the girl is telling the truth, both the boy and the girl would support the same team – the Demons. This is not possible, as it is known that they support different teams.

To determine the percentage of people who attend church at least 52 times per year, the percentages of people who attend ‘every week’, ‘several times a week’ or ‘every day’ are added (13.2%). The percentage of people who attend church 48 or 50 times per year best equates to ‘nearly every week’ (4.7%); ‘two or three times a month’ equates to only 24–36 times per year.

The proportion who attend church ‘once every three or four years’ cannot be determined from the data given. The ‘less than once a year’ category would include people who attend once every three or four years, but would further include people who attend more or less often than this.

The percentage of people (and therefore the number) who attend church just a few times a year best equates to either ‘once or twice a year’ (15.9%) or ‘several times a year’ (9.0%), both of which are more than the percentage who attend ‘about once a month’ (2.6%).

The proportion (and therefore the number) of people who attend church once every few years must be included in ‘less than once a year’ (17.4%), and the proportion who attend more than three times a year comprises categories in the table from ‘several times a year’ down (total 33.2%). The former is less than the latter.
A Incorrect
If X is the small glass, when half of the water from X (12.5 mL) is poured into Y, Y will contain 50 + 12.5 = 62.5 mL. When half of this water (31.25 mL) is poured into Z, Z will contain 81.25 mL. As half of this water (40.625 mL) is poured back into X (which now contains 12.5 mL), X will overflow its maximum capacity of 50 mL.

B Correct
If Y is the small glass, when half of the water from X (25 mL) is poured into Y, Y will be completely full (50 mL). When half of this water (25 mL) is poured into Z, Z will contain 75 mL. When half of this (37.5 mL) is poured back into X (which now contains 25 mL), X will contain 37.5 + 25 = 62.5 mL. Thus, the operations can be completed without any glass overflowing.

C Incorrect
If Z is the small glass, when half of the water from X (25 mL) is poured into Y, Y will contain 50 + 25 = 75 mL. When half of this water (37.5 mL) is poured into Z (which already contains 25 mL), Z will exceed its 50 mL capacity and overflow.

D Incorrect
The operations can be completed without spilling any water, as detailed in B.

Question 15
In this set of frames, note that the black square occurs in three inside corners of the arrowed shape, and at the ends of two arrows. A black spot occurs twice in the bottom right corner of the arrowed shape but only once in each of the other corners. A white spot occurs on four of the arrow ends, and is absent in E. The simplest explanation of this pattern is that, between frames, the black dot moves anticlockwise inside the arrowed shape, starting in the left corner, by increasing amounts (one position, then two positions, then three positions, etc.). The black square moves clockwise around the arrowed shape, starting in the top right corner, one position at a time, and alternating between internal corners and arrow ends. The white spot alternates between left and bottom arrow ends, and is hidden by the black square in E. Therefore, the sequence is CBDEA, and the answer is D.

Question 16
In this pattern, note that there are four different shapes (peace sign, star, starburst and ring) in three different sizes. Each completed row and column contains three different shapes, and each completed row contains shapes of the same size. The background pattern within each frame in a row (and column) is different. The simplest explanation for this pattern is that, starting from top left, four shapes zigzag through the squares and shrink in each row. (The resulting pattern has a high degree of symmetry). Therefore, the shape in the missing frame should be a medium-sized star, with a background that differs from other backgrounds in the same row and column. The alternative that satisfies these conditions is C.

Question 17
In this sequence, note that each figure can be viewed as consisting of a pair of outer lines and a single inner line. The outer pair of lines is either horizontal or vertical; the inner line occupies four different positions. The simplest explanation of this pattern is that, between frames, the outer pair alternates between horizontal and vertical positions, while the inner line rotates anticlockwise 45º. Therefore, in the 5th frame, the two outer lines should be horizontal while the inner line should run diagonally from top left to bottom right. The alternative that satisfies these conditions is D.

Question 18
In this set of frames, note that the different shapes occur with differing frequencies. It is possible to arrange the frames in order so that there is a difference of just one shape from one frame to the next. For example, there is an arrow in A and a circle in B, but the other three shapes are the same. The simplest explanation of this pattern is that, between frames, one shape is replaced by a different one, starting with A. In the first swap, the arrow is replaced by a circle; then the arrowed cross is replaced by a heart; then the straight cross is replaced by a hexagon; and, finally, the arc is replaced by a cube. Note that none of the new shapes is replaced. Therefore, the sequence is ABEDC, and the answer is E.
**Question 19**

In this pattern, note that each shading (dots, stripes and crosses) occurs once in each completed row and column. The shapes with concave sides in the first two columns can be viewed as altered versions of a square and triangle, respectively. Thus, each shape (rectangle, triangle and diamond) occurs once in each completed row and column, but one of these per row/column occurs in altered form. Therefore, in the missing frame the shape should be an altered rectangle with dots. The alternative that satisfies these conditions is **C**.

**Question 20**

In this sequence, note that between frames, two of the shapes change positions. The simplest explanation of this pattern is that, starting from bottom left and moving clockwise around the points of the triangle, the shape at the point of the large triangle swaps positions with the one in the centre. In the first swap, the cross moves into the centre while the circle moves to the left point; in the second, the small triangle moves to the centre and the cross moves to the apex, and so on. Therefore, in the 5th frame, the circle should be in the centre, the small triangle should be at the lower left point and the cross should in the apex position. The alternative that satisfies these conditions is **B**.

**Question 21**

A Incorrect
If proglumide causes pain, people given proglumide should experience greater pain than people in the control group. As there was no difference in the intensity of pain experienced by these two groups, it suggests that proglumide does not cause pain.

B Incorrect
If proglumide causes anxiety, people given proglumide should experience greater anxiety than people in the control group. As there was no difference in the intensity of anxiety experienced by these two groups, it suggests that proglumide does not cause anxiety.

C Incorrect
Since A and B are both incorrect, C must also be incorrect.

D Correct
As the intensity of both pain and anxiety was the same for the people given proglumide and the people subjected to the control, it suggests that, on its own, proglumide causes neither pain nor anxiety.

**Question 22**

In this question, it is important to recognise that there is no information given on other types of cancers, other types of cancer deaths, or about what proportion of all cancers are skin cancers. The first graph shows the proportion of all skin cancers that are melanoma. The second graph shows the proportion of all deaths from skin cancers that are due to melanoma.

A Incorrect
The two diagrams provide no information on cancers other than skin cancers.

B Correct
The first graph shows that melanoma makes up less than 10% of all skin cancers. The second graph shows that about 80% of skin cancer deaths are due to melanoma.

C Incorrect
The two diagrams provide no information on the number of deaths due to melanoma, or about the total number of cancer deaths.

D Incorrect
This statement is the opposite of what could be concluded from the diagrams, which show that deaths due to melanoma are about four times more common than deaths due to other types of skin cancer.

**Question 23**

The question shows a schematic diagram of a portion of the solar system. The relative positions of Earth and Mars are shown at different times during their orbits around the Sun. The straight lines drawn from
Earth to Mars show the position of Mars as seen from Earth. This apparent motion of Mars from Earth is then traced out at the top of the diagram. This question can be answered on the basis of the information provided – prior knowledge of the phenomenon described is not required.

A Incorrect
The diagram shows that both Earth and Mars orbit the Sun. Mars does not orbit Earth, in either a regular or irregular orbit.

B Correct
‘Apparent motion’ needs to be equated to ‘appears to move’. ‘Irregularly’ needs to be equated to the apparent zigzag motion.

C Incorrect
The wording of this option is somewhat ambiguous. The pattern ‘decreases then increases’ is true for the part of the orbit shown, but the diagram does not provide information on the rest of the orbit. However, as Mars and Earth are orbiting at different rates, the change in distance will not always follow this ‘increase then decrease’ pattern, but it is not possible to determine the relationship in any more detail. Given these uncertainties, B is a better answer.

D Incorrect
Although Mars has an orbit that is further from the Sun than Earth, it is apparent from the diagram that Earth has a faster orbit than Mars.

Question 24
In this sequence, note that between frames, each of the five different shadings (grey, white, dots, black and checks) occurs in a different part of the overall figure. For example, white occurs in the small central circle in the 1st frame, in the large square in the 2nd frame, in the small square in the 3rd frame and in the larger circle in the 4th frame. The simplest explanation of this pattern is that the shadings flow though the shapes, in the following order: small central circle, large square, small square, larger circle, triangles. Therefore, in the 5th frame, the triangles should be white, the central circle should be grey, the large square should be checked, the small square should be black and the larger circle should be dotted. The alternative that satisfies these conditions is C.

Question 25
In this pattern, note that the overall figure consists of a central group of four ‘jigsaw’ pieces; touching the outer corner of each piece is an enlarged version of it. One black dot is present on each of the larger jigsaw pieces and a circle is positioned centrally. The simplest explanation of this pattern is that it operates on the basis of symmetry. Therefore, the missing frame should contain a curve that completes the circle, a single dot, and a large jigsaw piece that abuts the small bottom right piece and has the same shape. The alternative that satisfies these conditions is B.

Question 26
In this set of frames, note that both the black dot and the star occur twice in one quadrant and once in each of the other quadrants. The simplest explanation of this pattern is that, between frames, the black dot moves one quadrant clockwise. The star also moves clockwise, but by an increasing amount (one quadrant, then two quadrants, then three quadrants, etc.). Therefore, the sequence is BADCE, and the answer is D.

Question 27
In this question, it is important to recognise that the scale on the horizontal axis is not completely regular.

A Incorrect
The graph indicates that there were approximately 400 000 families raised by divorced mothers with at least one child under 16. It does not indicate how many children were in those families.

B Incorrect
The increase in the number of single-mother families was faster, not slower, in the five years after 1986 than in the five years before. Between 1981 and 1986, the increase was approximately 110 000. Between 1986 and 1991, the increase was approximately 220 000.
C Incorrect
The graph indicates there was approximately five times the number of families raised by single mothers. As with A, no conclusions can be made regarding the number of children in these families.

D Correct
The graph indicates that throughout the period from 1991 to 1992, the number of families raised by divorced mothers (approximately 430 000) was less than the number of families raised by single mothers (between 450 000 and 500 000).

Question 28
In this question, it is important to recognise that ‘proved innocent’ indicates that DNA evidence is, in this context, taken to be definitive.

A Incorrect
No information is provided on the accuracy of DNA testing, although ‘proved innocent’ suggests that it is considered to be definitive.

B Correct
If the DNA evidence is taken as proof, it follows that the eye-witnesses must have been unreliable.

C Incorrect
There is no information provided that suggests DNA testing should be restricted to confirming or denying eye-witness accounts. Indeed, in 4 of the 28 cases, DNA testing proved the innocence of people found guilty despite not having positive eye-witness identification, suggesting DNA testing should be used more broadly.

D Incorrect
The information provided only refers to proving innocence of people initially found guilty after positive identification by eye-witnesses. The proof of guilt by DNA testing is not addressed.

Question 29
In this question, it is important to recognise that there are equal numbers of men and women in the given population.

A Correct
Of the 10 out of every 100 people (10%) who do not like bullfighting, 7 are women and, therefore, 3 are men. As 50 out of 100 people on Islandia are men, 3 out of 50 men do not like bullfighting.

B Incorrect
This proportion would be most likely obtained by mistakenly subtracting 3 from 50 in the ‘3 out of 50’ in A.

C Incorrect
This answer would be most likely obtained by assuming that because 7 out of 10 people who do not like bullfighting are women, 7 out of 10 women do not like bullfighting. The two are not equivalent.

D Incorrect
This proportion would be most likely obtained by mistakenly conflating elements of each of the other options.

Question 30
In this question, the key is to recognise that the statements refer to each other and that the consequences of one of them being true need to be followed through to see if a contradiction arises.

A Incorrect
A logical contradiction – I cannot be true as it states that none of the statements (and therefore itself) are true.

B Incorrect
If II were true, then I must be true, which is shown above to be impossible. Further, if II were true, it would provide another contradiction to I.
C Correct
It is shown above that II is false. Therefore, III is true. Further, if II is false, it follows that I is also false, which is also shown above. As it is given that only one statement is true, IV must be false, which is the case if III is true.

D Incorrect
If IV were true, then III must be false. If III is false, then II (and therefore I) must be true. But it is shown above that II cannot be true.

Question 31
In this pattern, note that in moving up the ‘pyramid’ the number of circles decreases. The number of both vertical and horizontal lines varies, suggesting an arithmetic relationship between them. The simplest explanation of this pattern is that the lines in two adjacent circles in a row combine to give the lines in the circle immediately above: horizontal lines are added; vertical lines are subtracted. Therefore, the missing frame should contain one vertical line and nine horizontal lines. The alternative that satisfies these conditions is D.

Question 32
In this sequence, note that between frames, three shapes (triangle, square and circle) change positions in the ‘stack’; the triangle also flips vertically. The triangle is in front twice; the square and the circle are in front once. The simplest explanation of this pattern is that, between frames, the topmost of the three shapes moves to the back of the stack and exposes the shape under it. Therefore, in the 5th frame, the triangle should have moved to the back, exposing the square; the circle should now be in the middle. The triangle apex should point up. The alternative that satisfies these conditions is E.

Question 33
In this set of frames, note that each type of shaded square(s) occurs in each column, and B and E are exactly the same pattern. The simplest explanation of this pattern is that, between frames, the black square moves one position diagonally; when it reaches the bottom right corner it returns to the top left corner. The same pattern is followed by the two spotted squares and two striped squares; when these double squares reach the bottom right corner, in the next frame the square ‘falling off’ the edge of the grid wraps to the other end of the column. Therefore, the sequence is BDCAE, and the answer is C.

Question 34
A Incorrect
No information is provided on the likelihood of conception.

B Incorrect
No information is provided on the number of children women are having during their fertile years.

C Incorrect
As life expectancy has increased but the age of menopause has remained constant, women are now living longer after menopause than they did in the 1850s.

D Correct
As menarche is now at a younger age and the age of menopause has remained constant, the interval during which women can conceive children is now longer than it was in the 1850s.

Question 35
In this question, it is important to recognise that there is a distinction between contributions to sea-level rise by all mountain glaciers and by just the Patagonian glaciers.

A Correct
The average loss of ice from the Patagonian glaciers during 1995–2000 was equivalent to a sea-level rise of 0.5 mm (0.1 mm/year for five years). In the 20 years from 1975 to 1995, ice equivalent to a sea-level rise of 0.5 mm was lost. Thus, the average over this 20-year period was 0.025 mm/year, one-quarter of the rate during 1995–2000.

B Incorrect
As shown in A, the average ice loss during 1975–1995 was equivalent to a sea-level rise of 0.025 mm/year.
C Incorrect
The Patagonian glaciers only contributed to a sea-level rise of about 1.0 mm during 1975–2000. This accounts for about 10% of the global sea-level rise caused by melting mountain glaciers. Thus, the total sea-level rise over the 25-year period was about 10 mm, or about 0.4 mm/year.

D Incorrect
The average rate of 0.1 mm/year was for 1995–2000 only. The average rate over the 25-year period was about 0.04 mm/year.

Question 36
A Incorrect
To determine the effectiveness of hand-washing it is necessary to also consider the number of microorganisms transferred when hands are not washed, i.e. a control. This information is not provided.

B Incorrect
As with A, no conclusion can be made concerning the effect of washing hands compared with not washing them.

C Correct
The information required to make this comparison is provided: wet hands transmitted many more microorganisms (60 000) than hands that were dry (200), indicating that moisture assists in the transfer of micro-organisms.

D Incorrect
The information shows that even dry hands transmit micro-organisms, albeit fewer than wet hands.

Questions 37 - 41
This passage is in the voice of a nine-year-old girl, reflecting about her mother. The girl has been being mistreated by her peers and the mother suggests she needs to stand up for herself. The girl sees her peers as her friends and believes it is her fault that she is bullied. She also comes to the realisation that her mother is powerless to change this.

Question 37
A Incorrect
The mother doesn’t say anything to suggest that she is angry. She tries to analyse the situation in a rational way. She focuses more on the need for her daughter to stand up for herself.

B Correct
The mother tries to help her daughter (by suggesting she needs more ‘backbone’), but realises that there is little she can do: ‘I wish I knew what to do’.

C Incorrect
There is no suggestion that the mother is embarrassed. In fact, from the daughter’s description it seems that the mother is comfortable with being quite unconventional (she would turn up carrying a bouquet of weeds) – so she is not the type to be embarrassed by inadequacies. She seems to feel ineffectual rather than embarrassed.

D Incorrect
The mother says, ‘I wish I knew what to do’ – she is unable to give advice and is clearly not confident.

Question 38
A Incorrect
The daughter does not express anger. She corrects her mother: ‘They don’t call me names . . . They’re my friends’. So she is not angry with the children or the situation, more worried that she can’t cope with it adequately.

B Correct
There are various ways in which the daughter expresses worry. She says, ‘What is happening to me is my fault . . . ’; she therefore acknowledges that something is ‘happening’ and she expresses concern that she is ‘ spineless’, with a backbone like a sardine. To say, ‘Misery washes over me’ also suggests worry.
C Incorrect
The daughter does not know how to overcome her spinelessness and her mother has confessed that she does not know what to do, so there is no optimism.

D Incorrect
The daughter is concerned that she is weak – she is not unconcerned.

**Question 39**
A Incorrect
The daughter does not have enough confidence to be proud or defiant – she didn’t stand up to her peers.

B Incorrect
The daughter speaks of her mother in a matter-of-fact tone, accepting her and confiding in her. Any criticism she expresses is not bitter and the tone is not sarcastic.

C Incorrect
‘Kind but misguided’ does not accurately describe the comment – there is no way in which it is a ‘kind’ comment, and from the evidence we have, it is true that the mother is not like other mothers, so the comment is not misguided.

D Correct
The daughter runs through the ways that her mother differs from other mothers, thus there is an implication of criticism that she does not conform – ‘They won’t believe her.’ Yet, the daughter is accepting of her mother. There is no suggestion that the mother has failed because she hasn’t been able to tell her how to become less spineless. And the daughter confides in her mother, indicating that she sees her as accepting.

**Question 40**
A Incorrect
It is clear that the daughter is not strong enough to stand up to the bullies on her own; she does not have the confidence yet to cope with such a situation. She would have no reason to stand up to the bullies unless she acknowledged that she was mistreated. The daughter describes the children as her friends – she doesn’t see them as bullies.

B Incorrect
Even if the mother does not know what to do, it is clear that she is concerned, and this will provide comfort and protection that the daughter is likely to need.

C Correct
A first step will be for the daughter to recognise that she does not deserve to be mistreated. In the passage it seems that she has not yet fully recognised this – she believes that the children are her ‘friends’ and that the situation is her fault. Only when she recognises that something bad is happening, will she change the situation. The mother understands the problem more clearly than the daughter, who is yet to acknowledge it.

D Incorrect
The situation would not change if it were ignored.

**Question 41**
A Incorrect
The mother’s relationship with the other mothers does not directly affect the situation.

B Incorrect
The mother has noticed a problem so she knows the bullying is occurring. If the problem were hidden it would not go away.

C Incorrect
The mother does not lack interest in her daughter’s welfare; she talks about the situation and tries, albeit ineffectually, to make a suggestion.
D Correct
Until a problem is acknowledged (the daughter recognising that she is being mistreated) the situation cannot be resolved. The daughter has not acknowledged that there is a problem.

Question 42
In this set of frames, note that three of the arrow heads are shaded black while two are shaded white, and that the shadings on the arrow ‘shaft’ (one white, two grey and two black segments) change positions. The simplest explanation of this pattern is that between frames, the arrow head alternates between white and black, and the three shades on the shaft flow towards the arrow head by one segment, and return through the arrow tail after reaching the arrow head. Therefore, the sequence is DAEBBC, and the answer is E.

Question 43
In this set of frames, note that two frames contain both a white and a black dot; two frames have dots that are partly covered and two frames have only one dot. As well, each frame contains a line that appears to be the border of an opaque trapezium covering a section of the hexagon. The simplest explanation of this pattern is that, between frames, the trapezium moves clockwise around the hexagon 120º, fully or partly covering any balls that occupy the same space. The black ball moves clockwise one corner, and covers the white ball. The white ball moves two corners anticlockwise, starting under the black ball. Therefore, the sequence is EBACD, and the answer is A.

Question 44
In this pattern, note that in each row of frames from left to right, and in each column from top to bottom, the number of marked squares (heavy black borders) increases. The marked squares occur only around the perimeter of each frame. One marked square is grey. The simplest explanation of this pattern is that each marked square in the left column is the starting point of a separate chain. In each row from left to right, one square is added to the leading edge of each chain and the chain advances one position clockwise around the perimeter of the frame. Where squares from separate chains overlap, they become grey. Therefore, the missing frame should contain three chains (which overlap), with marked squares along the entire top, left and bottom of the frame, and grey marked squares in the top and bottom left corners. The alternative that satisfies these conditions is B.

Question 45
In this pattern, note that in each column (but not each row), each of the component lines of the figures occurs exactly twice. This in itself is the simplest explanation of this pattern. Therefore, the missing frame should contain those elements of the figures above it that occur only once in the column - a square and a diamond. The alternative that satisfies these conditions is C.

Question 46
In this sequence, note that between frames, the number in each of the three positions changes according to a different pattern. The bottom number increases by the same amount each time, but the lack of a simple arithmetic relationship between frames for either the upper left or upper right number suggests that an additional rule is involved. The simplest explanation of the pattern is that the numbers in each frame are successive multiples (× 2, × 3 etc.) of those in the first, and the two upper numbers swap positions between frames. (The bottom number also equals the sum of the two upper numbers.) Therefore, in the 5th frame, the numbers should be five times those in the first frame: the upper left number should be 10, the upper right number should be 15, and the bottom number should be 25. The alternative that satisfies these conditions is B.

Question 47
In this sequence, note that between frames, a new shape appears and one shape disappears. Three of the shapes from one frame to the next are present, but change position and are altered. The simplest explanation of this pattern is that, between frames, a new shape enters the top right quadrant and moves clockwise through the quadrants, first shrinking in size, then stretching horizontally, then rotating clockwise 90º, before exiting. Therefore, in the 5th frame, there should be a new shape in the top right
quadrant, a small upright triangle at bottom right, a horizontally elongated diamond at bottom left, and a vertically oriented parallelogram at top left. The alternative that satisfies these conditions is A.

**Question 48**

A Incorrect

It is clear that the addition of a third property had an effect, but it is not evident that the effect was mere confusion, as the introduction of the third property resulted in an increase in the proportion selecting Q over P, while none selected R.

B Incorrect

People may have chosen Q over R due to its proximity to work, but they would also have chosen P over R. And therefore the choice is really between P and Q as in the original scenario. The hypothesis needs to account for the change in the proportion of people selecting P and Q after the introduction of R.

C Correct

This is the best explanation available. People chose equally between P and Q, when these were the only options, presumably depending on whether they most valued price or proximity to work. However, comparing the three properties, P, Q and R, is more difficult. Some people therefore restricted their comparison to the much simpler Q versus R, and always chose Q as it is better on both proximity and price. The remainder of the people made the comparison between all three properties, rejected R as the worst option and, as in the initial scenario, chose equally between Q and P. The overall result was an apparent preference for Q.

D Incorrect

No information is provided on relative transport costs. Even if true, it simply reinforces that R is a poor choice and therefore does not account for the change in proportions choosing P and Q.

**Question 49**

A Incorrect

The ingested garlic could produce, at most, 10 parts per billion of acetone, yet the level in the breath is 500 times greater. The acetone must be produced by some other mechanism.

B Incorrect

This option is a conflation of different ideas in the information provided. Acetone can be produced by the breakdown of cholesterol, but there is no indication that acetone, from garlic or elsewhere, interacts with cholesterol to cause the breakdown of sulfides.

C Incorrect

There is no information provided to determine the rate at which the acetone ingested from the garlic breaks down. This option could be selected if the 5 parts per million in the breath is misread/misunderstood as half of the 10 parts per million in crushed garlic.

D Correct

Of the four options this is the only one that is consistent with the information provided. Most sulfides in the breath decline relatively soon after eating garlic, but the levels of two sulfides are high after more than a day. This is consistent with the possibility that some sulfides come directly from the consumed garlic, while others are a by-product of digestion.

**Question 50**

In this question, it is important to understand the proposition that a tree experiences more force on the side with more foliage, due to the greater surface area available to the wind. It is also important to recognise that a corollary of the Sun being in the southern sky in the northern hemisphere is that the Sun is in the northern sky in the southern hemisphere.

A Correct

Trees in the northern hemisphere would have more foliage on their south side. Therefore, the force of northerly winds would be spread evenly across the tree, rather than being exerted mostly on one side.

B Incorrect

Trees in the southern hemisphere experiencing easterly winds would have trunks twisted anti-clockwise.
C Incorrect
Trees in the northern hemisphere experiencing easterly winds would have trunks twisted clockwise.

D Incorrect
Trees in the southern hemisphere experiencing northerly winds would not have twisted trunks.

Questions 51 – 55
In this passage, a man describes his experience in hospital after having been in a traffic accident.

Question 51
A Incorrect
The description implies that it is a disturbing experience. There is nothing to suggest that being in a ‘closer relationship with the floor and ceiling of a room’ provides security.

B Incorrect
In the tone of the first paragraph there is no expression of negative emotion such as resentment.

C Incorrect
In the tone of the first paragraph there is no expression of negative emotion such as fear.

D Correct
The man describes how one’s perspective changes when lying down, and from his perspective everything looks different from usual, an expression of disorientation.

Question 52
A Correct
The patient describes the conversation, and his feelings can be inferred from his sparse commentary - when one young doctor describes his own near-miss experience in a way that seems to invite sympathy, the patient comments, ‘I remained silent’ that he does not feel sympathetic. Moreover, he does not agree that there are crazy people ‘out there’, but rather that they are ‘in here’. In other words, he suggests that the doctors are more concerned about their own experiences than those of the patient they are meant to be caring for. Thus the patient feels ‘neglected and insignificant’.

B Incorrect
The patient’s belief that he should be valued and the centre of attention is implied in his responses to the conversation, but he is clearly not the centre of attention. The doctors are focusing on their own experiences.

C Incorrect
In terms of relieving the pain and horror of his accident, there is no evidence to suggest that the conversation makes the patient feel worse.

D Incorrect
The doctors show no understanding of the patient’s situation - and certainly no empathy for him. One doctor asks ‘vaguely’ how long the plaster has been on and then continues where he left off describing his own near-miss experience; they show no understanding or interest in the patient’s situation.

Question 53
A Incorrect
It seems reasonable to expect that when doctors are examining patients they will show some interest in them. These doctors do not do so. The patient’s response is therefore not petty or ungrateful; his disapproval is reasonable.

B Incorrect
The tone of the patient’s observations is low-key and wry. He sees the doctors’ disregard for him as inappropriate, but not in any way sinister or threatening, so he is not suspicious or fearful.

C Correct
The patient says very little indeed (he is reserved) and his few comments suggest disapproval: ‘there are some strange people in here’.
The patient does not show any sense of being intimidated by the doctors – he is silently critical of them, not afraid. A ‘submissive’ person would be unlikely to describe doctors as ‘strange people’ or to make ironic observations ‘“Worse?” I enquired’.

**Question 54**

A Incorrect
The doctors show little awareness of any kind, let alone acute awareness of the patient’s feelings.

B Correct
The doctors chatter about their own experiences, which shows a great lack of sensitivity for the patient.

C Incorrect
The doctors make only a passing comment about the patient’s situation: ‘so you were hit by a lorry’ – there is no genuine interest that could have been shown by following this up with, ‘That must have been frightening’, or ‘Do you remember any of the details?’

D Incorrect
The patient clearly does not feel comfortable. He is in unfamiliar surroundings, as described in the first four lines, and he is irritated by the doctors’ self-centred conversation.

**Question 55**

A Incorrect
If the patient were anxious he might ask questions; he might not be so controlled.

B Incorrect
The patient thinks, ‘there are some strange people in here’. This does not suggest respect. Also, he uses irony (in line 25) – this would be unlikely if he were showing respect for the doctors’ status.

C Correct
The patient does not wish to express sympathy for the doctors’ near-miss experiences and he does not express agreement that there are ‘crazy people out there’. The description suggests that the patient is in control and has chosen to remain silent because of his displeasure.

D Incorrect
The doctors ask only two questions, and in answering them the patient shows no confusion. To ‘So you were hit by a lorry’, the patient answers ‘yes’. To ‘How long has this plaster been on now?’, the patient answers ‘Five weeks’.

**Question 56**

In this pattern, note that each square in the ‘pyramid’ is divided into shaded quadrants. Moving up the pyramid, the number of squares decreases. The simplest explanation of this pattern is that adjacent squares in a row combine to produce the square immediately above: quadrants are black in the ‘daughter’ square only if they are black in both ‘parents’. Therefore, in the missing frame only the top left quadrant should be black. The alternative satisfies these conditions is A.

**Question 57**

In this sequence, note that in each frame, there is always a single grey square, but increasing numbers of black and dotted squares. In the 3rd and 4th frames, the grey square occupies the same position; in the 4th frame, a black square is missing. The simplest explanation of this pattern is that, between frames, starting at top right, the grey square moves diagonally two grid-squares; when it reaches the bottom left it retraces its path. The black and dotted squares can be viewed as lengthening chains. The number of dotted squares increases by one, with the second square added below the first, the third below and to the right of the second, and so on. The number of black squares increases by two, with one square added to each end of the chain; when the chain reaches the 2nd and 6th columns the squares turn. When both are in the same position, a dotted square covers a black square (as occurs in the 4th frame). Therefore, in the 5th frame, the grey square should be in the 3rd column from the right, 4th row from the top. Note that the sequence shown for the black and dotted squares does not enable a definitive prediction of their location in the 5th frame – since each pattern has already had one change, another is possible. However, once a square in a chain appears it does not change position, and this clearly
established aspect of the pattern can be used to eliminate \textbf{ABCD} as possible answers. Therefore the answer is \textbf{E}.

**Question 58**
In this set of frames, note that the arrow occurs in only two positions (top left or bottom right); the spot occurs in three positions (once at middle right, twice at top left, twice at bottom left) and the triangle occurs in all positions except at bottom right. The simplest explanation of this pattern is that, between frames, the arrow alternates between bottom right and top left, the triangle moves anticlockwise one corner, and the spot moves clockwise two corners. Therefore, the sequence is \textbf{DAEBC}, and the answer is \textbf{E}.

**Questions 59 – 64**
In this passage a son describes his feelings when he is confronted by the fact that his father, a retired doctor, is dying.

**Question 59**
A Incorrect
Wanting to ‘shake’ or ‘put a bomb under’ his father are not expressions of a feeling of pity.

B Incorrect
Wanting to ‘shake’ or ‘put a bomb under’ his father are not expressions of a feeling of sadness.

C Correct
The sons’ reactions are consistent with frustration: ‘I want to shake him’.

D Incorrect
The expression, ‘I want to put a bomb under him’ out of context might seem to suggest aggression, but it is followed with, ‘I want him to be dead rather than die like this’, which refers to the father’s attitude. The son is frustrated by the father’s state of depression.

**Question 60**
A Incorrect
The father’s response does not express offence; it is an indication of how such visits would be meaningless.

B Incorrect
There is no suggestion of reassurance in the words. Reassurance might come from meaningful contact and a sharing of feelings, whereas the father’s words indicate that only a shallow and mechanical connection would be possible.

C Incorrect
The words do not suggest that the father is determined to fight his condition – the words imply that such visits would be an artificial and shallow ritual and therefore be futile. No determination or hope of improvement is suggested.

D Correct
The words, ‘Number One, your five minutes are up. Come in Number Two’ imply that a succession of visits by friends would be an artificial and shallow ritual, and therefore pointless.

**Question 61**
A Correct
Neither father nor son show any doubt about the father’s imminent death. For example, the son’s repetition of ‘I know’ is a means of outlining the grim facts. There is no speculation, no expression of hope that things might change. Thus the son is trying to come to terms with his father’s condition.

B Incorrect
It is a case of facing up to grim facts rather than knowing exactly what is going on and it is not an expression of confidence – confidence is irrelevant here.

C Incorrect
This would suggest speculation or confusion. There is no speculation or confusion. The son knows that the father’s condition was found to be inoperable and that it is therefore incurable. His difficulty is in coming to terms with the situation, not with understanding it.
The son runs through the facts and he knows that his father is aware of what the facts mean. There is no suggestion of a softer option. Everything expressed points to the father being terminally ill.

**Question 62**

A Incorrect
The son doesn’t articulate the grim reality to his father - he doesn’t say to his father that they had to close him up ‘without doing anything’; he doesn’t say to him that he is dying (the father knows this).

B Incorrect
The son knows that the father is not exaggerating his condition: ‘And I know that he knows all this . . .’

C Incorrect
The son says that his father knows too much to be deluded. He is not making light of the situation; he is simply not saying what both of them know.

D Correct
The son tries to hide his feelings of frustration: ‘I want to put a bomb under him’ – he does not say these things to his father. Whilst underneath the son knows the grim reality, his actual comments are encouraging and positive: ‘you are much stronger than you were three days ago’; ‘the doctors are happy . . .’; ‘there are lots of friends who want to see you’.

**Question 63**

A Incorrect
The son knows that his father will never be well again.

B Incorrect
The son demonstrates that he can comprehend the situation and he is thinking deeply about it – struggling with it.

C Incorrect
The passage indicates that the son is dwelling on his father’s situation – for example, he is not expressing vain hopes that a miracle will occur. He is focusing on his father, not on other matters.

D Correct
The son’s frustration, expressed in the opening lines, shows an awareness of needing to come to terms with his father’s condition. The use of strong words, such as ‘put a bomb under him’, demonstrates the son’s struggle. He is aware that he carries on with ‘blather’ possibly as much for his own sake as for his father’s.

**Question 64**

A Incorrect
The fact of not wanting visitors is a consequence of knowing the situation, not the cause of being depressed.

B Incorrect
There is no suggestion that this is merely because the father is in hospital.

C Correct
The son states that his father has diagnosed himself and therefore come up with the accurate and grim diagnosis – he understands the extent of his illness, which is depressing.

D Incorrect
The son states that his father knows exactly what is happening to him – there is no suggestion of confusion.

**Questions 65 – 67**
Understanding basic scientific methodology is important in answering these questions.

**Question 65**

A Incorrect
The suffix in the word ‘hypercholesterolaemic’ indicates that such a person has too much cholesterol in
their blood, but it makes no reference to diet. No other information provided suggests that this could be the implied meaning.

B Incorrect
Blood pressure is not mentioned in the information given.

C Correct
The word ‘hypercholesterolaemic’, when broken down into its constituent parts, refers to ‘elevated/excessive’, ‘cholesterol’ and ‘blood’.

D Incorrect
This is a conflation of different ideas from the information given. ‘Hyper’ refers to increased, not lowered, levels; and ‘sterols’, as opposed to ‘cholesterol’, are not referred to in the constituent parts of the word. No other information provided suggests that this could be the implied meaning.

Question 66
A Correct
Giving a placebo to a control group is usual experiment methodology. Here it is necessary in order to make conclusions regarding the effectiveness of the different amounts of sterols.

B Incorrect
A placebo, rather than nothing at all, is generally given to control groups, in order to control for any effects (psychological or otherwise) of the treatment process itself.

C Incorrect
This cannot be determined. All that is stated is that participants in the study had normal levels of cholesterol or mild hypercholesterolaemia. If the study was well-designed, all groups would comprise both types of people.

D Incorrect
It is clearly stated that ‘There was no significant reduction in LDL in the control group’.

Question 67
A Incorrect
The opposite is true. Although Study II consisted entirely of hypercholesterolaemic people, Study I was made up of some people with normal cholesterol levels. These people also experienced a reduction in their levels of LDL.

B Incorrect
Neither study varied the length of time sterols were taken and both studies were of similar duration. Thus, it is not possible to make any conclusion regarding the effectiveness of sterols over time.

C Correct
Study I found no significant difference in LDL reduction at three different levels of sterol consumption, i.e. the minimum dose of sterols had as much effect as the maximum dose. Study II used a different level of sterols to those used in Study I, but its effect on LDL reduction was similar to that seen in Study I.

D Incorrect
If Study II (foods other than spreads), compared to Study I (spreads only), showed a significant increase in the average reduction in LDL levels, then this would be a valid inference. However, the percentage reductions were very similar in the two studies, suggesting that adding sterols to foods other than spreads does not increase their effectiveness at lowering LDL.

Questions 68 – 71
In this passage, the mother of a severely disabled son describes a recurring dream in which he does not have disabilities.

Question 68
A Incorrect
The mother doesn’t suggest that she or her son will be healed by her dream.
The mother indicates that she knows this will not really happen, so it is not a case of refusing to accept reality.

The mother is realistic: ‘It is not as if I think this would really happen’, but she says she can lose herself in the dream – it is a yearning that will never be fulfilled.

The mother describes ‘wrenching’ herself awake and that life is ‘so exhausting’. This indicates that she is aware of the influence of her son and that life with him will not change.

The dream provides the mother with nothing more than a temporary escape; there is no suggestion that the experience is uplifting.

The mother is quite clear: ‘It is not as if I think this would really happen’. She does not appear to be perplexed by the dream.

Although the mother has to wrench herself awake, the dream itself is not disturbing; in fact it gives momentary relief.

The mother finds the dream temporarily consoling: ‘I can lose myself . . .’; ‘all I want is some peace and quiet’. She suggests that she gets this peace and quiet while she is having the dream, but afterwards will wrench herself back into reality.

The dream itself is evidence of emotional trauma and to describe waking to a nightmare is not dispassionate or calm.

It appears that the mother has been coping for twenty-one years – she is not bewildered: ‘It is not as if I think this would really happen’.

The mother does not describe irritation, and waking into a nightmare does not suggest a positive outlook.

The mother states, ‘It is not as if I think this would really happen’, so there is no expression of hope.

The dream offers a form of relief. While she is dreaming, the mother can have some ‘peace and quiet’.

The mother knows it is just a dream. It provides relief, but not inspiration.

The dream does not offer perspective. It is only a dream.

In this sequence, the letters can be viewed as forming a sequence of their own, ABDGKPVC ... The simplest explanation of this pattern is that there are ‘gaps’ in the standard alphabetic sequence that
become larger at each step. There are no missing letters initially (AB), one at the second step (B–D), two at the third (D–G), and so on. After the letter C in the sequence, there should be seven missing letters. Therefore, in the 5th frame, the first letter should be K and the second one, separated from it by eight letters, should be T. The alternative that satisfies these conditions is A.

Question 73
In this sequence, note that between frames, the arrowed shape appears to rotate, but not by equal amounts. The simplest explanation of this pattern is that, between frames, the shape oscillates by increasing amounts. From its starting position, it rotates 90º anticlockwise, then 135º clockwise, then 180º anticlockwise. Therefore, between the 4th and 5th frame, the arrow should rotate 225º clockwise. The alternative that satisfies these conditions is D.

Question 74
In this sequence, note that between frames, each of the ‘balls’ moves through a constant distance but along a different path on the ‘pool table’. The simplest explanation of this pattern is that, between frames, the black ball moves horizontally, from left to right, one-third the width of the table at each step; after rebounding off the side it moves left. The white ball moves similarly, but up and down the table in increments of approximately one-tenth the table length. The grey ball moves and rebounds diagonally in steps one-sixth the width of the table. Therefore, in the 5th frame, the black ball and the white ball should be in the positions they occupied in the 1st frame, and the grey ball should be close to the bottom edge. The alternative that satisfies these conditions is B.

Questions 75 and 76
These questions require candidates to understand and apply two ‘rules’ proposed by psychologists that children could be using to predict the movement of a balance. The candidates must view the six balance problems from the children’s perspective and compare this to what would happen in reality (neither rule accurately predicts all possible situations). Understanding what would happen in reality requires no specialised knowledge.

Question 75
C Correct
Applying Rule 1, the following would be predicted: V As there are more weights on the right, the child
I As there is the same number of weights on both sides, the child would predict no movement. This is correct, even when weight distribution is considered.
II As there are more weights on the right, the child would predict movement down on the right. This is incorrect; the weight distribution would result in no movement.
III As there is the same number of weights on both sides, the child would predict no movement. This is incorrect; the weight distribution would result in movement down on the right.
IV As there are more weights on the right, the child would predict movement down on the right. This is incorrect; the weight distribution would result in movement down on the left.
V As there are more weights on the right, the child would predict movement down on the right. This is correct, even when weight distribution is considered.
VI As there are more weights on the right, the child would predict movement down on the right. This is correct, even when weight distribution is considered.

Thus, the child would correctly predict the movement for three of the balance problems – I, V and VI.

Question 76
A Correct
As the number of weights on each side is different, the child would make the same prediction as a child using Rule 1; that is, both would (incorrectly) predict movement down on the right (see Question 75).

B Incorrect
As the number of weights on each side is the same, this is what a child using Rule I would predict (see Question 75). However, a child using Rule II would take the weight distribution into account and predict (correctly) that the balance would move down on the right.
Question 77
In this pattern, note that there are three different configurations of the lines and three different versions of the square pattern. The simplest explanation of this pattern is that each line configuration and square pattern version appears only once in each row and column. Therefore, the missing frame should contain the line configuration like that shown in A and D, and the square pattern like that shown in B, D and E. The alternative that satisfies these conditions is D.

Question 78
In this pattern, note that the black circle and white circle in the left column are in the same position in each row. Note, too, that the circles are always located at the end of one of the short ‘tick marks’ positioned around the grid, and that at each corner of the grid there are two tick marks. The simplest explanation of this pattern is that, from left to right in each row, the circles and the black shading are moving through differing numbers of positions. In the top row, the black circle is moving two ticks clockwise; the white circle is moving two ticks anticlockwise; and the black shading is moving one quadrant of the grid clockwise. In the middle row, the black circle is moving three ticks clockwise; the white circle is moving three ticks anticlockwise; and the black shading is again moving one quadrant clockwise. In the bottom row, the black circle is moving four ticks clockwise; the white circle is moving four ticks anticlockwise; and the black shading is again moving one quadrant clockwise. Therefore, the missing frame should have the black circle at the bottom left corner (on the vertical tick mark), the white circle at the top middle position, and the black shading in the top left quadrant. The alternative that satisfies these conditions is A.

Question 79
In this set of frames, note that the inner shapes have 4, 5, 6, 7 and 8 corners and their associated outer shapes have 3, 4, 5, 6 and 7 corners. The simplest explanation of this pattern is that the frames are ordered according to the number of corners (either for the inner shape, outer shape or the combined total). Note also that this results in the inner shape in one frame becoming the outer shape in the next frame. Therefore, the sequence is DBEAC, and the answer is E.

Question 80
In this set of frames, note that the ‘wave’ in the flag has two positions, and that two of the three different combinations of shading (check, grey, black) occur twice in the set while the third occurs once in the set. The simplest explanation of this pattern is that, between frames, the shadings move through the flag right to left one segment (returning to the right end). The flag’s wave alternates between its two positions. Therefore, the sequence is CEDAB, and the answer is D.

Questions 81 – 85
These questions require some assumptions about the likely childhood environment experienced by politicians in the different categories: only-children, first-born, middle-born and last-born children.

Question 81
A Correct
The finding that only-children and first-born children are over-represented among politicians suggests these groups are more likely to take up a career in politics. In general, only-children and first-born children do receive undivided attention from their parents in their early years, since there are no other children to divide attention. Thus, early undivided attention is a possible explanation for the over-representation of only-children and first-born children among politicians.
As explained in A, first-born children are apparently more likely to take up a career in politics. In general, first-born children would have more experience at giving orders to younger siblings and such experience may help explain the over-representation of first-born children among politicians. However, middle-born children would also have such experience and yet are not similarly over-represented. This factor also does not account for the over-representation of only-children among politicians, because they lack such experience. Thus, this factor is, at best, only a partial explanation of the survey results.

The opposite of A. Only-children and first-born children appear more likely to become politicians, not less likely.

The opposite of B. First-born children appear more likely to become politicians, not less likely.

This question requires the determination of hypothetical results that support a particular hypothesis about the over-representation of the various groups among politicians. The hypothesis is different to that most strongly supported by the actual results (see Question 81). It can be assumed that first-born children have the most experience of giving orders to younger siblings, and last-born and only-children would not have such experience. Middle-born children would presumably have some such experience. Thus, if giving orders increases the likelihood of becoming a politician, it would be expected that first-born children would be over-represented amongst politicians and last-born and only-children would be under-represented. It is not clear how the limited experience of middle-children in giving orders to younger siblings affects their likelihood of becoming a politician, and thus no firm predictions can be made for this category.

This is consistent with expectations for first-born and only-children. But there are no clear expectations for middle-born.

The opposite is expected for only-children.

The opposite is expected for only-children and first-born children.

The hypothetical results given here for first-born, last-born and only children are all consistent with expectations if giving orders to younger siblings increases the likelihood of becoming a politician.

An appropriate title should highlight the main conclusion of the study and should not be misleading in any way.

First-born children are over-represented amongst politicians, but so are only-children. Without knowing what proportion of politicians come from these two categories and how this compares to the general population, it is not possible to determine whether they are in fact more likely, as a group, to have younger siblings.

The results clearly suggest that birth order influences the likelihood of a career in politics.

The size of families is not mentioned, except in the case of only-children. Although it may be true that only-children (= small families) are more likely to become politicians, this title does not account for the increased likelihood of first-born children (= any size families) becoming politicians.

No conclusion can be made about the likelihood of entering politics compared with other careers. The fact that politicians are more likely to be only-children or first-born does not necessarily mean that such children are more likely to enter politics than other careers.
**Question 84**
This question asks what ‘last-born children’ means. The key here is recognising what ‘last’ implies. It is also necessary to recognise that the categories given cannot overlap.

**A Incorrect**
The categories ‘last-born’ and ‘only-children’ cannot overlap.

**B Incorrect**
See A.

**C Correct**
The term ‘last-born’ implies that there are older children in the family. A family with two children has a first-born and a last-born. Families with more children will have a first-born, one or more middle-born, and a last-born, but two children is sufficient to give ‘last-born’ meaning.

**D Incorrect**
While a family of three children does have a last-born, it is not necessary to assume that last-born children are from families with at least three children.

**Question 85**
This question is similar to Question 25. The difference here is that the hypothetical conclusion is to be supported by a subset of the actual results. Specifically, the results for just two categories, when considered in isolation from the other results, should support the proposition that giving orders to younger siblings increases the likelihood of becoming a politician.

It can be assumed that first-born children have the most experience of giving orders to younger siblings, middle-born children have some experience, and last-born and only-children no such experience. Thus, if giving orders influences the likelihood of becoming a politician, it would be expected that first-born children would be over-represented amongst politicians and last-born and only-children would be under-represented. It is not clear how the limited experience of middle-children in giving orders to younger siblings affects their likelihood of becoming a politician.

**A Incorrect**
In the actual results of the survey, first-born are overrepresented (consistent with expectations) and only-children are also over-represented (inconsistent).

**B Incorrect**
In the actual results of the survey, last-born are under-represented (consistent) and middle-born are also under-represented (expectation not certain).

**C Incorrect**
In the actual results of the survey, first-born are overrepresented (consistent) but middle-born are underrepresented (expectation not certain).

**D Correct**
In the actual results of the survey, first-born are over-represented (consistent) and last-born are under-represented (consistent).

**Questions 86 - 91**
In this passage, a couple who have been married for three years discuss their finances.

**Question 86**

**A Incorrect**
The discussion is not about the nature of Steve’s work.

**B Correct**
In the context of the discussion, Steve indicates that Madeline’s expectations are too demanding – she describes the hours that her hard-working parents worked and implies that Steve should do the same, whereas he believes in a more balanced lifestyle.

**C Incorrect**
Steve is not making the point that he is tired. He wants a balanced life.
D Incorrect
Steve is indeed wanting to balance work and leisure – he doesn’t suggest that it is impossible.

Question 87
A Incorrect
Suggesting that Steve should work as hard as her parents is not a way of strengthening his relationship with them, particularly since he is resistant to such long hours of work.

B Correct
Madeline is trying to convince Steve that his views about working are misguided. She holds her parents up as an example.

C Incorrect
At this point Madeline is not needing to emphasise her pride in her parents’ financial status; she is making a point about obligation to pay them back money.

D Incorrect
There is no suggestion that Steve feels inadequate or that Madeline wants to help him.

Question 88
A Correct
Steve feels resentful. This is apparent in many of his comments: ‘how sick and tired I am .. .’; ‘Sorry Madeline . . .’; and particularly his final comment: ‘What about what I want?’

B Incorrect
There is nowhere that indicates that Steve feels chastened. In fact the argument heats up as it progresses.

C Incorrect
Steve’s final comment is not an expression of indifference – if that were the case he might say, ‘okay, have a baby then’.

D Incorrect
The argument is heated, Steve is not sympathetic; he is more concerned with himself.

Question 89
A Incorrect
Steve is grateful for the money Madeline’s family has provided, but he disagrees about the need to pay them back quickly – it is not a case of using her family against him.

B Correct
Steve considers that Madeline is dictating how he should live his life – this comes out particularly clearly in his final comment. He also resents her implication that they go out too often.

C Incorrect
Steve is aware that Madeline would make the same sacrifices – for example, she thinks they go out too often, implying that she is uncomfortable about this and would be prepared to go out less.

D Incorrect
The issue of Madeline socialising with Steve’s friends is irrelevant to the argument.

Question 90
A Correct
This issue seems to be an on-going tension, as Steve talks about arguing in circles and being ‘sick and tired’ of her going ‘on and on’, in a way that implies these arguments have been visited before.

B Incorrect
If it were an unfamiliar issue there would be more questioning, surprise and explanation, and resentment might not have had time to build up.

C Incorrect
The borrowed money appears to be a very significant issue in the relationship - a great deal hinges on it, including starting a family, and the argument reveals the existence of different values that the pair bring to the relationship.
There is no evidence of progress having been made – as Steve says, they are arguing around in circles.

**Question 91**

**A Incorrect**

They are not in a mood to agree to disagree and the matter is too significant to be left unresolved forever. Madeline is embarrassed that they are not repaying her parents – she would not let this matter rest.

**B Correct**

The way the argument has been developing suggests that Madeline’s only response could be one of being hurt and offended. As far as she is concerned they have been arguing about paying back money to her parents and Steve’s comment implies that he is not keen to have a baby, which would probably affect her deeply – it seems to be something she has wanted for some time: ‘When are we ever…’.

**C Incorrect**

Madeline won’t be grateful for Steve’s honesty – it is possible that she would prefer not to know his true feelings about having a baby and for her the issue at hand is repaying her parents. She is not interested in what Steve wants to do unless it is a case of changing his lifestyle so that they repay the parents more quickly.

**D Incorrect**

There is nothing to suggest that Madeline would accept blame or apologise. She sees Steve as in the wrong.

**Questions 92 – 97**

In these questions, it is not generally necessary to apply the rules; the questions can be answered by correctly interpreting the second figure.

**Question 92**

**B Correct**

Interpreting the second figure, the three arrangements in which all discs are on a single peg are represented at the three corners of the figure, [AAA], [BBB] and [CCC]. From each of these arrangements, two others can be achieved on the next move. Reasoning from the rules, when all discs are on the same peg the topmost disc can move to either of the two empty pegs, i.e. two different arrangements can be achieved on the next move.

**Question 93**

**D Correct**

Each link in Figure 2 represents a single move. Following the quickest ‘route’ (a straight line) from [AAA] to [CCC] requires seven moves. The first letter in each sequence indicates the peg on which the smallest disc sits. Following the straight line, the first letter is [A], [C], [C], [B], [B], [A], [A], [C]. Thus, the smallest disc moves four times. Any other route requires more moves of the smallest disc.

**Question 94**

**B Correct**

The one factor common to all three bold links is that the third letter in a sequence changes. The third letter does not change in any other links between sequences. As the third letter represents the largest disc, the bold links indicate the only moves that involve the largest disc.

**Question 95**

**C Correct**

A disc cannot sit on top of one smaller than itself. Therefore, peg A can only have the smallest disc on top of the largest [A-A], the smallest on top of the middle-sized [AA-], or the middle-sized on top of the largest [-AA].

**Question 96**

Moving all discs from one peg to another is represented in Figure 2 by moving from one corner to another. The fewest moves required is seven, i.e. a straight line from one corner to another.
A Correct
To follow the sequence of moves directly from one corner to another, the first move is of the smallest disc to the peg on which the three discs will finally sit, e.g. moving from [AAA] to [CCC]. The first move should be [CAA]. This is true no matter which peg the three discs start or end on.

Question 97
This question requires candidates to extend the rules to a fourth disc. Note that the task is to select the incorrect option, i.e. three of the options given can be achieved on the next move.

A Correct
The sequence changes from [ABCC] to [AACC]. This represents the second-smallest disc moving from Peg B to Peg A. However, Peg A already has the smallest disc on it. This move violates rule 2. None of the other options violate this rule.

B Incorrect
The sequence changes from [ABCC] to [ACCC]. This represents the second-smallest disc moving from Peg B to Peg C, to sit on top of the third-smallest disc. This move is allowed.

C Incorrect
The sequence changes from [ABCC] to [BBCC]. This represents the smallest disc moving from Peg A to Peg B, to sit on top of the second-smallest disc. This move is allowed.

D Incorrect
The sequence changes from [ABCC] to [CBCC]. This represents the smallest disc moving from Peg A to Peg C, to sit on top of the third-smallest disc. This move is allowed.

Questions 98-101
Question 98
A Incorrect
The medical staff are considered to be diligent because they go about doing their best in terms of keeping the man physically alive by transfusing him with blood. However they are perceived as misguided by the woman because, according to her, they are not focussing on the real issue of importance – the fact that the man has no quality of life at all because of his Alzheimer’s disease.

B Incorrect
In the passage there is no evidence that the woman found the medical staff negligent or incompetent. According to her ‘they were only doing their job’. She finds it unfortunate that the medical imperative is to emphasise keeping the man alive, instead of them heeding her protests and the man’s will, but she does not find them negligent or incompetent for doing this.

C Incorrect
From the woman’s perspective the doctors are neither sympathetic nor indecisive. They appear to have no awareness of her concerns over the quality of her husband’s life, but are wholly focussed on his physical symptoms. There is no evidence that they were indecisive – in fact, we get the impression that they were the opposite – decisive in treating his physical ailments.

D Incorrect
While the woman does not question the technical competency of the medical staff there is definitely an inference that they were missing a certain emotional competency, in that they weren’t interested in considering the quality of the man’s life. They were only interested in his physical situation and there is no evidence of them understanding the woman’s fundamental concerns.

Question 99
A Incorrect
While there is an awareness of the discomfort the man is in, this is not the woman’s main concern. She mentions the intense medical treatment, and that her husband’s body was ‘failing’ but does not focus on his physical pain, but rather her husband’s lack of quality of life.

B Correct
The woman in the passage is very much concerned with her husband’s lack of dignity and outlines the various aspects of his life that cause him indignity such as being in ‘diapers, spoon-fed, bed-bound’. She
does not think that keeping her husband alive is worthwhile because his ‘mind was gone’ and he simply had no quality of life.

**C Incorrect**
This is incorrect because the wife is accepting of the fact that her husband’s life is coming to an end - ‘It was time for him to die; his mind was gone, his body failing.’ She does not speak of any recovery by her husband and clearly her main concern is his loss of dignity and his lack of quality of life.

**D Incorrect**
There is no evidence in the passage of the woman feeling humiliated, even though the medical staff do ignore her ‘protests’. She believes they ‘are just doing their job’ so she is not humiliated, rather she is accepting of their behaviour, although she thinks it is misguided. Her focus is firmly on her husband and not her own feelings.

**Question 100**

**A Incorrect**
The wife does not believe that the doctors were necessarily right in doing what they did but she is able to admit that they were carrying out their professional duty. She willingly acknowledges this and is not hiding anything as this distracter implies that she is.

**B Incorrect**
As for A, it is clear that the wife does not believe that the doctors were necessarily right in attempting to keep her husband alive at all costs and there is no evidence that she regrets her behaviour at the time. She notes that she has ‘since forgiven them’, implying that she believes her behaviour was correct and ethical at the time.

**C Correct**
The wife says ‘The job of the emergency team was to keep my husband alive’ and the focus of this statement is on the word ‘job’. Further on in the passage she says ‘they were only doing their job’. The wife doesn’t condemn them for doing their job, but believes the focus in these situations is inappropriate. It’s about blood transfusions and other physical treatments, rather than the things that matter more to her, like human dignity and individual requests not to be kept alive. She does not condemn them or blame them, but it is clear she believes their ‘job’ is inappropriate in these circumstances.

**D Incorrect**
While the wife believes that her husband’s treatment was inappropriate there is no evidence that she is condemning the doctors through sarcasm. This would be a misreading of her comments ‘they were only doing their job. They have one mission: to save lives’ and the reader would be imputing too much tone into those lines if they believed erroneously that they contained sarcasm.

**Question 101**

**A Incorrect**
This option would not have helped the wife because she didn’t agree with the medical procedures in the first place, so having them explained would have made no difference to her. Her stance, and her feelings, would have remained the same even if the procedures were explained to her.

**B Incorrect**
The wife would not have felt reassured by this. To the wife, the best treatment in this situation is no treatment. She would rather her husband die with some dignity, instead of being kept alive by this medical treatment.

**C Incorrect**
There is no evidence in the passage that the wife found the situation so distressing she wanted to leave. Her distress comes from another source - that is, she is distressed because of the priority given to the medical treatment (e.g. blood transfusions) over her husband’s personal dignity and wishes.

**D Correct**
The wife describes a situation where the medical team is totally focussed on the medical/physical outcomes of their treatment and not the emotional/personal outcomes. She would have been helped, in this situation, by the medical staff showing consideration of her husband’s wishes (and her own) in relation to his treatment at this late stage of his Alzheimer’s disease.
**Question 102**

In this pattern, note that the black line is always the same length, and always along the perimeter of the grid of dots. The simplest explanation of this pattern is that, from left to right in each row, the line is moving three dots clockwise around the perimeter of the grid. Therefore, the missing frame should have the line in a position exactly between the positions of the line in the left and right columns of the bottom row. The alternative that satisfies these conditions is **E**.

**Question 103**

In this sequence, note that the black and grey shadings each move through all four quadrants but that the shapes (heart, star and circle) never appear in the bottom right quadrant. The simplest explanation of this pattern is that, between frames, each of the shadings moves one quadrant clockwise, while the shapes also move one quadrant clockwise but only through the top left, top right and bottom left quadrants. Shapes are hidden if they have the same shading as the quadrant they are in. Therefore, in the 5th frame, the black shading should be in the top left quadrant, the grey shading in the bottom right, the heart in the top left, the star in the top right and the circle in the bottom left. The alternative that satisfies these conditions is **B**.

**Question 104**

In this set of frames, note that the black rectangles never appear in the centre square and can be orientated horizontally or vertically and in either half (left/right or top/bottom) of the square in which they lie. Also note that a rectangle appears in the same position in each of frames A, B and C. The simplest explanation of this pattern is that, between frames, one rectangle moves two squares clockwise around the perimeter, rotating 90 degrees each time; the other rectangle moves one square clockwise, alternating between the top and bottom halves of the square. Therefore, the sequence is **BDEAC**.

**Questions 105 – 108**

In these questions, it is important to recognise that the women represented in one age group in one decade are in an older age group in the next decade.

**Question 105**

**C Correct**

In 1970, 36% of the women aged 20–24 had never married. Ten years later, in 1980, these women were aged 30–34, and 11% of the cohort had never married. Thus, 25% of the cohort married for the first time between 1970 and 1980. And 25% of 4 000 000 is 1 000 000.

**Question 106**

**D Correct**

From the information provided, it is possible to calculate the approximate age of marriage for most cohorts (see Question 105), but not for all (e.g. not for the 20–24 cohort in 1970).

**Question 107**

**A Correct**

In 1980, 36% of the women aged 20–24 had never married. Ten years later, in 1990, these women were aged 30–34, and 18% of them had never married.

**B Incorrect**

Although it is indicated that 77% of the women aged 18–19 in 1980 had never married, this cohort were aged 28–29 ten years later and information for this age group is not given (and cannot be deduced).

**C Incorrect**

In 1960, 29% of women aged 20–24 had never been married. Ten years later, in 1970, these women were aged 30–34, and 7% of them had never married. Thus, more than half of the women aged 20–24 who had never been married in 1960 married in the next ten years.

**D Incorrect**

Although it is indicated that 71% of the women aged 18–19 in 1960 had never married, this cohort were aged 28–29 ten years later and information for this age group is not given (and cannot be deduced).
**Question 108**
Note that the options here focus on women who had been married (are married or used to be married) as opposed to never married.

**A Incorrect**
The opposite of **C**. 24% (100% – 76%) of women aged 18-19 in 1970 had been married, compared with 48% (100% – 52%) of women aged 20-24 in 1990. Thus, women aged 18-19 in 1970 were half as likely to have been married as women aged 20-24 in 1990.

**B Incorrect**
82% (100% – 18%) of women aged 30-34 in 1990 had been married, compared with 64% (100% – 36%) of women aged 20-24 in 1980. Women aged 20-24 in 1980 were actually twice as likely as women aged 30-34 in 1990 to be never married.

**C Correct**
48% (100% – 52%) of women aged 20-24 in 1990 had been married, compared with 24% (100% – 76%) of women aged 18-19 in 1970.

**D Incorrect**
The opposite of **B**. 64% (100% – 36%) of women aged 20-24 in 1980 had been married, compared with 82% (100% – 18%) of women aged 30-34 in 1990. Women aged 20-24 in 1980 were actually twice as likely as women aged 30-34 in 1990 to be never married.

**Question 109**
In this set of frames, note that there appear to be two circles and four other shapes; of the six shapes, only five appear in any one frame. Also note that although the shapes are in different positions in each frame, they are in the same order relative to each other. The simplest explanation of this pattern is that the shapes form a ‘string’ that, between frames, moves up one position; an ‘invisible’ 6th position lies outside each frame. Following one shape facilitates ordering of the frames; for example, following the cross gives **ACED**. For **B** to be the last frame in this sequence, the cross would have to be in the topmost position; instead, the cross is apparently in the invisible position and, thus, **B** must be the first frame. Therefore, the sequence is **BACED**.

**Question 110**
In this sequence, note that in each frame, the number of squares in the bottom right corner is equal to the sum of the numbers in the other corners (e.g. in the 2nd frame: 3 + 2 – 1 = 4). Between frames, each of the numbers either decreases or increases by the same amount. (There is no obvious relationship between the three numbers). The simplest explanation of this pattern is that, between frames, each number alternatively decreases by 2 and increases by 1. Therefore, in the 5th frame, there should be four squares in the bottom right corner and each of the numbers should have increased by 1, to become (clockwise from the bottom left corner) 2, 3 and –1. The alternative that satisfies these conditions is **B**.

**Question 111**
In this pattern, note that in each row some dots appear in the same position in each frame, other dots ‘disappear’, and the number of dots in the right column is less than the number in either the left or middle column. This pattern does not appear to operate down the columns. The simplest explanation of this pattern is that, in each row, the left and middle frames combine to give the right frame: only dots present in the same position in the first two frames are retained in the right frame. Therefore, since the right frame in the bottom row is empty, all of the dots in the missing frame should be in positions different to those in the middle frame. The alternative that satisfies these conditions is **D**.

**Questions 112 – 115**
In this passage, a woman describes her perspective on starting to recover from depression.

**Question 112**

**A Correct**
The doctor denies that the woman is silly and indicates that she would expect her to need support: ‘I don’t expect you to do it on your own’.
The doctor’s response is very sensitive to the woman’s needs.

The doctor’s response is straightforward and clear: ‘I don’t think... I don’t expect...’, so the response is not ambiguous.

The doctor doesn’t challenge the woman – she doesn’t ask her questions or deny her statements in any way.

Question 113
A Correct
We know that the woman had tried many doctors but still felt like ‘a silly, neurotic woman’. This doctor denies that she is silly and thus appears to take the woman seriously.

B Incorrect
There is no indication of promising the woman she would get better.

C Incorrect
The doctor takes the woman seriously: ‘I don’t think you are silly...’

D Incorrect
The doctor denies the woman’s thoughts that she is ‘silly...’, she doesn’t confirm them.

Question 114
A Correct
The woman was left feeling ‘silly’, and thus unsupported.

B Incorrect
There is nothing in the woman’s account that suggests the other doctors helped her to keep her illness in perspective. All we know is that she went away feeling silly and neurotic.

C Incorrect
There is no evidence to suggest that the doctors helped the woman more than she realised – and the fact that she is visiting ‘yet another doctor’ indicates that she was not helped.

D Incorrect
There is also nothing to suggest that the other doctors made her condition worse.

Question 115
A Incorrect
The doctor denies that the woman is silly or neurotic, thus it seems that these descriptions are not correct and therefore do not reveal self-insight.

B Incorrect
Such a negative description does not reveal a sense of hope. Although the woman does say ‘inside myself I still had hope’, this is contrasted with her self-description, which suggests a feeling of inadequacy.

C Correct
‘Silly’ and ‘neurotic’ are derogatory terms that reveal a sense of shame or inadequacy.

D Incorrect
‘Silly’ and ‘neurotic’ are not light-hearted or amusing terms and do not reveal a sense of humour.

Questions 116 and 117

Question 116
C Correct
i may be true. As about 51% of both groups I and II experienced the same reduction in levels of pain, it may be that the effect of the acupuncture is ‘psychologically mediated’, i.e. due to belief in the efficacy of the process rather than any direct physiological effect.
cannot be true. If it were true, there would be a difference in the percentage of groups I and II who had experienced a reduction in levels of pain.

may be true. As about 51% of both groups I and II experienced the same reduction in levels of pain, it may be that the effect of acupuncture is due to the direct physiological effects of needle insertion, regardless of where they are inserted.

**Question 117**

**B Correct**

Group III acts as a control because it allows a comparison between people who receive any form of acupuncture against those who do not. Without this control, it is not possible to determine whether pain levels would have decreased without acupuncture.

Group II also acts as a control because it allows a comparison between people who receive real acupuncture and those who receive sham acupuncture. Without this control, it is not possible to determine whether needle insertion needs to be in specific acupuncture locations to be effective.

**Questions 118 – 121**

As given in the introduction, the bacteria are attracted by attractants I, II and III. In the experimental set-up in Figure 1, the chemoreceptors for I are saturated. In this saturated state, this chemoreceptor cannot detect any other attractants that it would normally detect. However, chemoreceptors for attractants other than I will not be affected. Thus, if the bacteria fail to move towards a mix containing I and another attractant, it indicates that the chemoreceptor for I is also the chemoreceptor for the second attractant. Conversely, if the bacteria do move towards a mix containing I and another attractant, the two attractants must have different chemoreceptors.

**Question 118**

A Incorrect

This would only be supported if the bacteria were attracted to the tube in both containers (however, this result would equally support option D).

B Correct

As the bacteria were not attracted to the tube in the first container, the bacteria must have the same chemoreceptor for I and II. As the bacteria were attracted to the tube in the second container, the bacteria must have a different chemoreceptor for III.

C Incorrect

This would only be supported if the bacteria were attracted to the tube in the first container but were not attracted to the tube in the second container.

D Incorrect

This would only be supported if the bacteria were attracted to the tube in both containers (however, this result would equally support option A).

**Question 119**

**B Correct**

The most appropriate control would allow the experimenter to be confident that the bacteria are behaving as expected in the presence of all conditions except the variable under consideration, i.e. the attractant that is mixed in the tube with I. A control identical in all respects except for the addition of a second attractant to the mix allows the determination of, for example, whether the bacteria is saturated with I.

**Question 120**

In this experiment the first container has the same set-up and result as that given in Figure 1, while the second container is different. However, the same conclusion was drawn from both experiments, i.e. that there is one chemoreceptor for I and II and a second for III. From the first container, it is apparent that I and II have the same chemoreceptor. Therefore the second container must support the conclusion that a second chemoreceptor detects III.

In this question, it is important to recognise the importance of good experimental design in determining which option is the most likely set-up.
A Incorrect
This result would indicate that bacteria saturated with II are not attracted to a mix of attractants II and III. This is only possible if II and III have the same chemoreceptor, which is contrary to the conclusion of the first experiment.

B Incorrect
This result would indicate that bacteria saturated with III are attracted to a mix of I and II. This is only possible if III has a different chemoreceptor to that of I and II - the same conclusion as for the first experiment. Therefore, B is a potential correct answer. However, the set-up in B is not ideal: if I and II had different chemoreceptors, the bacteria in the second container would always be attracted to the tube, regardless of whether the chemoreceptor for III is different to the chemoreceptor for either or both of I and II. In this case, the first container would indicate that I and II have different chemoreceptors, but the second container would provide no further information. Thus, in a carefully designed experiment, the set-up in D is more likely than the set-up in B.

C Incorrect
This result would indicate that bacteria saturated with III are not attracted to a mix of II and III. This is only possible if II and III have the same chemoreceptor, which is contrary to the conclusion of the first experiment.

D Correct
This result would indicate that bacteria saturated with III are attracted to a mix of I and III. This is only possible if I and III have different chemoreceptors. Thus, it can be concluded that I and II have the same chemoreceptor and III a different chemoreceptor - the same conclusion as for the first experiment. In conjunction with the results from the first container, the set-up in D allows the number and nature of the chemoreceptors to be determined regardless of the results (unlike the set-up in B).

Question 121
In this experiment the first container has the same set-up and result as that given in Figure 1, while the second container is different. In this experiment, it was concluded that I, II and III all have the same chemoreceptor. From the first container, it is apparent that I and II have the same chemoreceptor. Therefore the second container must support the conclusion that III has the same chemoreceptor as the other two attractants.

A Correct
This result would indicate that bacteria saturated with II are not attracted to a mix of II and III. This is only possible if II and III have the same chemoreceptor. Thus, it can be concluded that I, II and III have the same chemoreceptor. In conjunction with the results from the first container, the set-up in A allows the number and nature of the chemoreceptors to be determined regardless of the results (unlike the set-up in B).

B Incorrect
This result would indicate that bacteria saturated with III are not attracted to a mix of I and II. This is only possible if III has the same chemoreceptor as I and II. Therefore, B is a potential correct answer. However, the set-up in B is not ideal, for the same reason as given for B of Question 120. In a carefully designed experiment, the set-up in A is more likely than the set-up in B.

C Incorrect
This result would indicate that bacteria saturated with III are attracted to a mix of I and III. This is only possible if I and III have different chemoreceptors.

D Incorrect
This result would indicate that bacteria saturated with III are not attracted to a mix of II and III. This is only possible if II and III have the same chemoreceptor.

Question 122
In this sequence, note that the square and circle are always located in corners, the square does not move between the 2nd and 3rd frames, and the circle moves only between the 2nd and 3rd frames. Each of the two different arrow types is associated with the movement of a different shape: the thin arrow is present in the frame before the square moves, while the thick arrow is present in the frame before the circle moves. The simplest explanation of this pattern is that the thin and thick arrows alternate between
frames and indicate the direction a shape is to move, with the thin arrow directing the square and the thick one directing the circle. Therefore, between the 4th and 5th frames, the square will remain in the bottom left corner and the circle will move to the same corner. It is not established what will happen when both shapes are in the same corner, but only alternative B has the square in the bottom left corner and it has apparently hidden the circle. Thus, B is the best answer.

**Question 123**

In this pattern, note that in each row and column the black star appears in only two positions (top left corner and bottom right corner), while the white star appears in one of three positions or is missing. The simplest explanation of this pattern is that, between adjacent frames, the black star alternates between the top left corner and the bottom right corner. In each row, from left to right, the white star moves clockwise one corner; and down each column the white star moves anticlockwise one corner. It is hidden by the black star when both are in the same position. Therefore, the missing frame should have the black star in the top left corner and the white star in the bottom left corner. The alternative that satisfies these conditions is A.

**Question 124**

In this pattern, note that the left column contains only grey circles, the middle column only speckled circles and the right column contains both types. The number of each type in the right column is the same as the number of each type in the other columns. The positions of each type in the right column are always different from their positions in the other columns. The simplest explanation of this pattern is that the circles in the left and middle columns are first ‘rotated’ around the centre square of each 3 × 3 grid: left column anticlockwise one position, the middle column clockwise one position. The rotated circles in each column are then simply transferred to the right column. Therefore, the missing frame should contain speckled circles in the top left and bottom right corners of the 3 × 3 grid, and grey circles in the other positions of both the left side and the right side of the grid. The alternative that satisfies these conditions is C.

**Question 125**

In this set of frames, note that the diamond pattern appears only in the perimeter squares, the black shading appears only in the corner squares, and the grey shading is present in the middle row only. Also note that the diamond pattern is missing in E. The simplest explanation of this pattern is that, between frames, the diamond pattern moves one square clockwise around the perimeter, the grey shading moves one square from left to right (‘coming back in’ on the left), and the black shading moves one corner anticlockwise and hides the diamond pattern when both are present in the same square. Therefore, the sequence is ACDBE.

**Question 126**

In this set of frames, note that there appear to be two white octagons, two grey, one checked and one striped. Of the six octagons, only five appear in any one frame. Also note that although the different coloured octagons are in different positions in each frame, they are in the same order relative to each other. The simplest explanation of this pattern is that the octagons form a ‘string’ that, between frames, moves one position to the right; two ‘invisible’ positions lie at the end of the string. Following one octagon facilitates the ordering of the frames; for example, following the stripes gives the sequence BCEA. For D to be the first frame in this sequence, the left-most octagon would have to be striped; instead, the stripes are apparently in the first invisible position and, thus, D must be the last frame. Therefore, the sequence is BCEAD.

**Questions 127 – 130**

This dialogue describes a conversation between a mother and her daughter. The mother’s marriage is over, after 32 years, with the husband leaving her. In the dialogue, the daughter questions her mother over ‘clues’ to her father’s behaviour, which she is having difficulty accepting.

**Question 127**

A Incorrect

Sophie is not apathetic about her parents’ marriage breakdown. She is actively seeking some answers
from her mother and it is clear that she cares a great deal about what has happened. Her dialogue is energetic and agitated – the opposite of apathetic.

**B Incorrect**
Sophie does not feel demeaned by her parents’ actions as she sees their separation as something that only involves them, and is not any reflection of her own behaviour. Her comments focus on signs (or lack thereof) in her parents’ relationship; her comments don’t focus on negative feelings within herself.

**C Correct**
Sophie is incredulous because she has had no inkling that her parents were going to separate and her overwhelming feeling is disbelief. This is mostly emphasised in the series of questions she asks, which show she is shocked by her parents’ separation.

**D Incorrect**
If Sophie was embarrassed by her parents’ separation, she would be far less interrogative, and far more reticent about questioning her mother. In the passage Sophie presents as a confident, feisty young woman and therefore she is unlikely to be embarrassed by her parents’ actions.

**Question 128**

**A Incorrect**
There is no evidence in the passage that shows that Sophie is scornful towards her mother in relation to her father. She is not judging her negatively, even though she is assuming that her mother has missed some vital ‘clues’ in regard to her father’s decision to leave her mother.

**B Correct**
The urgency of Sophie’s comments shows her impatience with her mother. She wants answers and is not getting any that satisfy her, so she keeps pressing her mother for explanations. The string of questions about her mother’s reaction to the separation reinforces her urgent need for answers which amounts to impatience.

**C Incorrect**
Sophie’s reaction to her mother’s news is animated and quite strident. She challenges her mother about her knowledge of the impending separation and none of these behaviours show empathy. She infers that her mother has been ignorant in not seeing the ‘codes’ and this implies judgement.

**D Incorrect**
The nature of Sophie’s questions show that she is not without sympathy. She is very eager to know more about the reasons for the separation and this shows she is interested in her mother’s feelings, and doesn’t lack sympathy. There is no evidence of hostility. The urgency of her tone is not hostile, but anxious.

**Question 129**

**A Incorrect**
Honor acknowledges what her husband has done in a matter-of-fact way: ‘That’s what happened’ which shows there is no guilt or regret – she is stating the facts of what occurred and is not judging her husband in the passage. At this point Honor is simply recounting how her husband left on ‘Tuesday’ and has not imbued her comments with guilt or regret.

**B Incorrect**
Honor is maintaining a sense of control over the conversation with her daughter Sophie, as her responses to Sophie’s questions show. If she was being contemptuous and angry, her words would be less controlled and she would attack her husband for leaving her.

**C Correct**
Honor responds to Sophie’s question about the ‘signs’ by saying ‘I don’t know. Does it matter?’ which reflects the acute sense of bewildement she is feeling about her husband’s actions. But she is not fighting against her husband’s decision to leave. Rather she shows a degree of acceptance, and infers that nothing will change his mind.

**D Incorrect**
While it would seem to make sense that Honor was feeling exasperated and annoyed with her husband of 32 years, there is no evidence in the passage to support this. Instead, Honor remains calm and appears to accept her husband’s decision. She makes no negative judgements about his character.
Question 130

A Correct
There is evidence that Honor is making a considerable effort to remain calm, inferring that she is quite shaken by her husband’s departure. Her repetition of ‘I don’t know’ and her observation ‘Does it matter?’ indicate a numbness in relation to the emotional trauma of the separation. She is not animated or aroused by anger, but rather somewhat subdued in her answers to Sophie’s questions.

B Incorrect
There is no evidence in the passage that Honor is angry with herself. When she is directly asked by Sophie about what has happened, the dialogue shows that she remains relatively calm and she answers Sophie’s questions directly. She is not berating herself oranguishing over what more she could have done to save the marriage.

C Incorrect
Honor is not hiding anything from Sophie so there is no likelihood that she feels relief that the situation is out in the open. Her statement ‘That’s what happened’ is evidence that she is being open and straightforward about the separation.

D Incorrect
There is no evidence in the passage that Honor is feeling irritated with Sophie’s questions. Sophie’s comments aren’t ‘advice’, but rather are observations of her own attitude towards her parents’ separation. In none of Honor’s comments does Honor show irritation.

Questions 131 and 132
In these questions, it is important to recognise that winning a division requires 21 votes or more.

Question 131

A Incorrect
There are many ways in which Nicky could lose the election despite receiving equal votes in each of the three divisions. For example, she could receive 20 votes in each division (totalling 60 votes). This loses all three divisions and, therefore, the election.

B Incorrect
There are many ways in which Nicky could lose the election despite receiving equal votes in each of two divisions and half that number in the third. For example, she could receive 18 votes in two divisions and 9 votes in the third (totalling 45 votes). This loses all three divisions and, therefore, the election.

C Correct
The minimum number of votes that Nicky will receive is 42. If she receives 21 votes in each of two divisions (and no votes in the third division) she will win both these divisions and, therefore, the election.

D Incorrect
There are many ways in which Nicky could lose the election despite receiving 40 votes in one division, ‘up to 20’ in a second and none in the third. Receiving 40 votes in one division will win that division, but her remaining votes (2 to 20) are not enough to win the second division needed to win the election.

Question 132

A Incorrect
There are many ways in which Nicky could lose the election with 70 votes. She loses if she doesn’t receive more than 20 votes in more than one division. For example, she could receive 20 votes in each of two divisions and 30 votes in the third. This wins only the third division and, therefore, loses the election.

B Incorrect
There are a number of ways in which Nicky could win all three divisions with 70 votes. She only needs 21 votes in each division to win all three, and the remaining 7 votes can be distributed in any manner. For example, she could receive 21 votes in one division, 22 votes in a second and 27 votes in the third.

C Incorrect
There are many ways in which Nicky could win just one division with 70 votes. For example, she could win one division with 30 votes, but receive only 20 votes in each of the other two divisions.
The maximum number of votes Nicky could receive and still lose all three divisions is 60 (20 votes in each division). With 70 votes she must win at least one division.

Questions 133 and 134
In these questions, it is important to recognise that hardwoods and softwoods are actually defined by certain characteristics (which are given) other than whether they have hard or soft wood.

Question 133
A Correct
Balsa is a hardwood. Hardwoods are often referred to as ‘pored timber’.

B Incorrect
Beech is a hardwood, but this does not necessarily mean that it has hard wood. (It is possible that it does, but this information is not given.)

C Incorrect
Yew is a softwood. Softwoods keep their leaves all year.

D Incorrect
Australian cypress is a softwood. Only hardwoods reproduce using pollination of their flowers by animals.

Question 134
Only hardwoods drop their leaves in winter.

A Incorrect
Only softwoods use wind-blown pollination.

B Incorrect
Only softwoods are gymnosperms.

C Incorrect
Hardwoods account for only about 20% (not a majority) of the world’s timber production.

D Correct
Hardwoods have flowers.