

# Selective High School Placement Test

## Thinking Skills

### *Explained answers for the sample test*

- 1 When Kai rolled a 5, he received 5 marbles from each of Joe and Alice.

When Joe rolled a 2, he gave 2 marbles to each of Kai and Alice.

The outcome of Alice's roll can be worked out by considering any one of the three friends:

After the second roll Kai had 42 marbles. For him to finish with 41 marbles, he must have given 1 marble to Alice as a result of Alice's roll.

After the second roll Joe had 21 marbles. For him to finish with 20 marbles, he must have given 1 marble to Alice as a result of Alice's roll.

After the second roll Alice had 27 marbles, so she must have received 2 marbles as a result of her roll (one from each of Kai and Joe).

Alice must therefore have rolled a 1, which is option **A**.

- 2 Aida says that one benefit of hobbies is that they help keep you happy and relaxed and that this enables you to study harder. Her argument is strengthened if there is another reason why it would be beneficial for Tom to continue with his hobby of drawing.

If artistic or creative skills are seen as important skills for engineers to have, then continuing with a hobby that practises those skills would be beneficial for Tom, so option **A** strengthens the argument.

- 3 If the person who stole the money must have had both an opportunity and a motive, then anyone who does not have either of those cannot be the person who stole the money. Option **D** is an example of this.

- 4 The first digit shown cannot be 0, 1, 3, 4, 5, 7 or 9, as in each of these cases there would be a segment lit up that should not be. It also cannot be 8, as that would require three of the segments not to be working. The numbers shown in the example are therefore 2 and 3, and the faulty segments are:

The vertical segment on the top right.

The vertical segment on the bottom right.

The correct solution is therefore the display of 4 with the two vertical segments on the right not lit. This is option **A**.

- 5** Sara: If the scores in writing were different, but the scores in reading were the same, then the totals could not be equal. So Sara's statement must be true.

Mila: If the scores in reading were the same, but the scores in writing were different, then the totals could not be equal. So Mila's statement must be true.

Therefore both statements must be true, which is option **C**.

- 6** Brian is 8 years old, so Eric must also be 8 years old as they are twins.

Lee must be 7 years old as he is 1 year younger than Eric.

Anita must be 10 years old as she is 3 years older than Lee.

So **D** is the correct option.

- 7** Since 9 of the goats did not have kids, the remaining 236 goats had at least one kid.

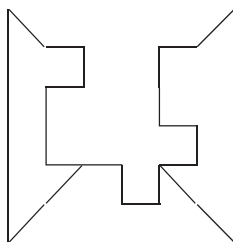
If they had had exactly one kid each, there would have been 236 kids in total, so the remaining  $357 - 236 = 121$  kids must have come from goats having two kids each (since none of the goats had more than two kids).

Therefore there were 121 goats that had two kids and  $236 - 121 = 115$  goats that had one kid. The correct answer is therefore **A**.

- 8** Sanjay's argument is that the uneven output from wind farms means that they can never meet our energy needs. If there was a way to store some of the energy generated for the times when the wind turbines are not able to supply enough, then this might not be true. But if storing the energy is not possible, then Sanjay's argument is strengthened, so option **B** is correct.

- 9** To calculate the number of players who will get prizes, Sam has added the three prizes for positions to the prize that will be given out for a hole-in-one. However, it may be that the player who has scored a hole-in-one finishes in the top three and so receives two of the prizes. The correct answer is **B**.

- 10 No right angles in the shapes are in positions that could be corners of the completed square, so it must be the case that the corners of the square are made by putting two of the 45-degree corners together. The only way that the three pieces could fit together is as shown:



The gap that is left is then filled by option **B**.

- 11 The information in the box tells us that anyone who is not creative or who does not have excellent attention to detail cannot become a successful architect, so Evie's reasoning is correct.

However, the information in the box does not tell us that anyone who is creative and has excellent attention to detail will certainly become a successful architect, so Will's reasoning is incorrect.

The correct answer is therefore **B**.

- 12 The information that is given and refers to positions in the row can be summarised as follows:

Ms White	Mr Green			
	Tennis	Badminton		
Van				

Since Mrs Black likes football, she cannot live in the middle house. Since she lives two houses from Dr Grey, she cannot live in the second house from the right. She must therefore be in the last house on the right, so the correct answer is **C**.

The fully completed table is:

Ms White	Mr Green	Dr Grey	Miss Orange	Mrs Black
Swimming	Tennis	Badminton	Golf	Football
Van	Motorcycle	Taxi	Car	Bicycle

**13** The highest two totals for the first two tests are 169 (James) and 160 (Layla). By scoring 100 on the final test, Layla would have a total of 260, so James needs to increase his total to 261 in order to be sure to win the prize. To do this, he needs a score of 92 on the final test, so option **A** is correct.

**14** Anh's mother's argument is that banning the cars will help to protect the children from harm. The reasoning given relates to accidents, but if statement **C** is true, then this is another form of harm and so it strengthens the argument.

**15** Ferdinand knows that every city is listed in his atlas and so he would be able to look up the country that any city is in. This is only the case if every city name is unique, as otherwise he can only work out which countries contain a city of the given name. The correct answer is therefore **B**.

**16** The diagram shows three of the four corners of four copies of the tile. From these tiles it can be seen that each tile must have squares in two of the corners, a triangle in one corner and a quarter-circle in the final corner.

To work out the pattern covered by the rectangle it is necessary to identify which shape is missing from each tile. These are as follows:

Top left: quarter-circle	Top right: triangle
Bottom left: triangle	Bottom right: square

The option that matches this is option **A**.

**17** Since Jun is an experienced programmer, he only had to pass the maths test in order to get a place on the course (and the result of the chess challenge was irrelevant in his case). Therefore, he must have failed the maths test since he did not get a place on the course. The correct answer is **C**.

**18** Since monotremes are the only type of mammal that lay eggs, it must be the case that any mammal that lays an egg is a monotreme. Therefore, Jack's statement is true.

If an animal that lays an egg is not a monotreme, then it cannot be a mammal, for the same reason. Therefore, Amelia's statement is true.

Both statements are true, so the correct answer is **C**.

- 19** The pass for 4 consecutive days is better value than the pass for 1 day as long as the bus is used on three of the days.

The pass for 7 consecutive days can be ignored as two passes for 4 consecutive days can be used to cover a period of 8 consecutive days for the same price.

There are three points where 3 out of 4 consecutive days are used and 1 additional day.

The cheapest price is to cover days 2, 3, 4 with a 4-day pass for \$10, day 6 is covered with a 1-day pass (\$5), days 10, 11, 12 with a 4-day pass (\$10) and day 14, 15, 16 with a 4-day pass (\$100).

Therefore, the cheapest price is  $3 \times \$10 + \$5 = \$35$ , which is option **B**.

- 20** The argument is that the falling birth rate in many countries is a concern as it is storing up a problem for the future. The problem in the future will be caused by the larger number of old people needing to be looked after and the smaller number of younger people to do this.

Additionally, older people are living longer, so if their health needs increase as they grow older, then this will add to this problem.

Option **B** therefore strengthens the argument.

- 21** The three factors that need to be considered are:

- Whether Monti slept well.
- Whether Monti is tired at / performs well at the interview.
- Whether Monti is offered the job.

In most cases the outcome is described as a possibility, which means that it will not create any situations that are not possible. However, if Monti was tired at the interview, then he could not get the job, so statement **D** is not possible.

- 22** The lines that are visible in the view from above will be from points/sections where the shape is at its widest.

In options A, C and D you would see 4 points/sections.

The only option where there are exactly 3 such points/sections is option **B**.

- 23** We know that any students who did not perform in the Spring concert will perform in the Autumn concert, but it is possible that some students will be able to perform in both concerts. Statement **A** therefore shows the mistake that Jarrah has made.
- 24** From the information given, anyone who likes volleyball likes skiing and (since they like skiing) they also like cycling, but not gymnastics. It is therefore not possible for someone who likes volleyball to like gymnastics, so statement **D** must be true.
- 25** There are only 2 days on which there will be no performances, so performances will take place on 29 days. The only days on which there is a second performance are the Mondays and Tuesdays: there are 9 of these (the 3rd, 4th, 10th, 11th, 17th, 18th, 24th, 25th, 31st).  
The total number of performances will therefore be  $29 + 9 = 38$ , which is option **A**.
- 26** The argument provides one possible explanation for Brazil's success in producing soccer teams (the large number of very poor areas) and then explains that there is a better explanation (the effect of developing skills through playing futsal). The argument is strengthened by evidence that the existence of very poor areas in itself does not guarantee the levels of success. Option **D** does this by identifying that similar situations exist in other countries, but the success in producing soccer teams does not follow.
- 27** The information in the box tells us that a red light flashing always indicates the processor overheating, but it does not rule out that the processor might overheat without the red light flashing. Yifan's reasoning is therefore incorrect.  
No information is given about the meaning of a continuous red light, and nor does it follow from the meaning of a flashing light, so Ria's reasoning is also incorrect.  
Neither Yifan's nor Ria's reasoning is correct, which is option **D**.
- 28** In order to identify the orientation of the pattern, think of the pattern as one line, so that there is a corner that can be identified as the starting point for the pattern. Looking at the two patterned squares covered by the stain, the starting points for the pattern are from the same corner. The only option for which this is also the case is option **D**, and it can be easily checked that the offcut would fit the gap if rotated 90 degrees anticlockwise.

- 29** Since Natalie finished second and was not as fast as Hailey, it must be that Hailey was the fastest. Therefore, statement **C** cannot be true.

From the information given, we can deduce the following:

	Ranking based on speed	Number of questions correct
Hailey	1st	2
Gabriella	3rd or 4th	4 or 5
Adam	5th	5
Natalie	2nd	3
Kamilla	3rd or 4th	No information

- 30** To show that the claim is true, it needs to be the case that:

- on every occasion on which STAIN-GONE was used, the stain was removed;
- on every occasion on which the stain was not removed, STAIN-GONE was not used.

We need to know that in the case of item 1, the stain was gone and that in the case of item 4, STAIN-GONE was not used. So (a) and (d) are needed, and the correct answer is **C**.

- 31** The total prices from each shop are as follows:

Shop A: (one book at half price)	$3 \times \$24 + \$12$	= \$84
Shop B: (no discounts)	$4 \times \$20$	= \$80
Shop C: (one book free)	$3 \times \$26$	= \$78
Shop D: (two books at half price. Equivalent to three full price)	$3 \times \$25$	= \$75

The cheapest option is therefore shop **D**.

- 32** The conclusion of the argument is that getting enough sleep is a key part of being successful. If getting less than seven hours of sleep can reduce people's ability to make good decisions, then this suggests that low amounts of sleep would reduce people's chances of being successful. Option **D** is therefore the correct answer.

- 33** We know that all of the Keentan fans were also fans of Wulijini, and that everyone who liked Wulijini also liked Koolchee. Therefore, the most popular game must be either Koolchee or Buroinjin.

Since none of the Buroinjin fans liked Wulijini, they cannot have liked Keentan either, so Buroinjin fans either only like Buroinjin or like Buroinjin and Koolchee.

Since the most popular game is either Koolchee or Buroinjin, then the people who liked both can be ignored. Since more people only liked Koolchee than those who only liked Buroinjin, Koolchee must be the most popular game. The correct answer is therefore **B**.

- 34** In the chart that was drawn, one of the sections is one quarter of the total. Since there is a section that is smaller and a section that is larger, the section that is one quarter of the total must be either comedy or romance.

The largest section on the pie chart represents more than twice the number in the section that is one quarter of the total. No category has more than twice as many as comedy, so the section that is one quarter of the total must be romance. The other two sections must therefore be fantasy and horror, meaning that comedy is the type of movie that was missed out. This is option **B**.

- 35** The argument is that memorising facts should become a thing of the past as it is now possible to look everything up on the internet. The argument can be weakened by identifying a purpose for memorising facts that is not undermined by the ability to look things up. If it is necessary to have some knowledge in order to make sense of information found online, this would count as such a purpose. Option **C** is therefore the correct answer.

- 36** If I were in Room 2, both statements on the door of Room 2 would be false. But no more than one statement on each door can be false, so I must either be in Room 1 or Room 3.

If I were in Room 1, the second statement on the door of Room 1 would be false, meaning the first statement would have to be true and my name would have to be Aziz. However, this would mean that both statements on the door of Room 3 were false, which is impossible.

Since I cannot be in either Room 1 or Room 2, I must be in Room 3, making **C** the correct answer.



- 37** The 8 dog owners have a total of 16 legs, so the dogs must have a total of  $60 - 16 = 44$  legs. Since all dogs have 4 legs, there must be 11 dogs and so there must be 3 dog owners with 2 dogs (11 dogs in total – 8 owners = 3 owners with two dogs).

The number of dog owners with one dog is  $8 - 3 = 5$ , which is option **C**.

- 38** Lisa has assumed that the fact that six county records were broken means that there were six students who achieved this. However, it may be that some students broke more than one record, in which case fewer than half of the qualifiers could be record-breakers. Option **A** is therefore the correct answer.

- 39** We know that all of the swimmers were fitter than all of the gymnasts.

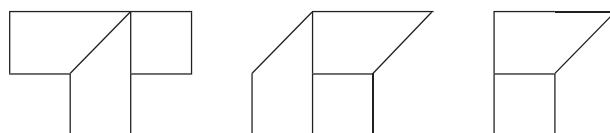
Since the fittest runners were fitter than the fittest swimmers, the fittest of those tested must have been runners.

Since all the gymnasts were fitter than most of the runners, the least fit of those tested must have been runners.

Since the fittest and least fit were all runners, it must be the case that the range of fitness levels was greatest amongst the runners. Option **B** is therefore correct.

- 40** Option **D** only has one of the diagonal sides visible and so cannot be made by putting the shapes together.

The other shapes can be made as follows:



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