READING

Climate is not the same as weather. The weather is the day-to-day state of the atmosphere, whereas the climate describes the likely weather conditions over a much longer period of time. Great climate changes have occurred, an example of which is the last ice age. _____
More recently, man has affected the climate as a result of pollution from industry, causing the earth to warm through what is called the greenhouse effect.

Which one of these sentences best fits the missing space?

a) The world is divided into five climate zones: polar, tropical, temperate, desert and forest.

b) Polar climate is the only zone where it is always below freezing and is covered with snow most of the time, as it is furthest from the equator.

c) Mankind can affect climate, for example when causing great forest fires that create so much smoke that obscure the sun for months, cooling a region.

d) Precipitation rates in the polar regions are low due to the area's dryness and the lack of heat from the sun.

MATHEMATICAL REASONING

Three friends, Jedda, Monty, and Rianna each have 40 dollars. They take turns rolling a standard die. Based on the results of each roll, money is transferred between the players according to these rules:
- If an even number is rolled, the player who rolled must give the amount shown on the die to each of the other two players.
- If an odd number is rolled, the player who rolled receives the amount shown on the die from each of the other two players.

After the first two rolls, the amounts of money held by the players are:

- Jedda has 45 dollars
- Monty has 38 dollars
- Rianna has 37 dollars

On the third roll, Monty rolls a 2 and ends with a total of $32 and Rianna rolls a 1 and ends with a total of $40. What did Jedda roll on his third attempt?

a) 1   b) 2   c) 3   d) 4   e) 5
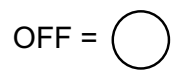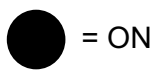
THINKING SKILLS

Switch A turns lights 1 and 2 on/off or off/on
Switch B turns lights 2 and 4 on/off or off/on
Switch C turns lights 1 and 3 on/off or off/on
Switch D turns lights 3 and 4 on/off or off/on

● = ON   OFF = ○

Switches D, B, C and A are thrown in turn with the result that Figure 1 turns into Figure 2. Which switch does not work at all?
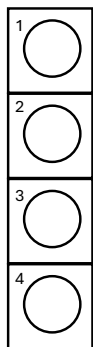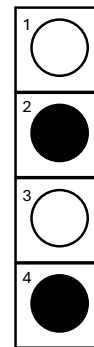

Figure 1

Figure 2

a) Switch A   b) Switch B   c) Switch C   d) Switch D

ANSWER: READING:

Option (c) since the sentence which follows begins "More recently" indicating that it must follow on from the idea in the previous sentence – how man can affect climate.

ANSWER: MATHEMATICAL REASONING:

Appreciate that this question contains details which are not required for the solution.

Note that at the end of each turn at rolling, the total amount of money held by the three friends should total $120.

Following the second round, Monty threw a 2 and ended up with $32.
Following the second round, Rianna threw a 1 and ended up with $40.

At the end of the third round, Monty and Rianna have a total of $32 +$40 or $72. This means that Jedda must have $48.
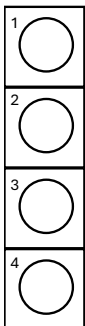
Between the second and the third rounds, Jedda gained $3.

From the 2 thrown by Monty, he would have gained $2 and from the 1 thrown by Rianna he would have lost $1 making a total gain of $1. Jedda's own throw would explain the difference between the $3 gain and the $1 gain.

This could only happen if Jedda threw a 1.

ANSWER: THINKING SKILLS:

The effect of switches D, B, C and A can be drawn in to the diagram. Assuming that all switches are working, the final diagram will look like this:

Comparing this to Figure 2, lights 2 and 4 do not match.

Switch B is the controller for these lights and hence is the non-working switch.

Alternatively, each switch changes twice so that figure 2 should be the same a figure 1 if all switches were working. This is not so for lights 2 and 4 (controlled by switch B)