SOUTH AFRICAN COMPUTER OLYMPIAD
Sample First Round Question Paper

Standard Bank

Learners should not be coached for an aptitude test (it defeats the object of the test). This sample set of questions is provided so that educators know what to expect.

Instructions:
This paper has a number of questions, some of which are preceded by an explanation. Work through the explanations carefully to ensure that you understand the nature of the question fully before attempting to answer the question.

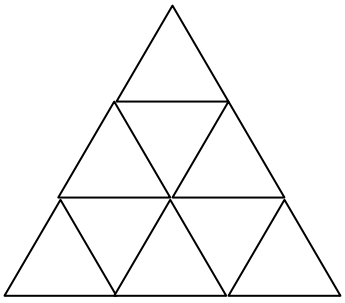
- Please write your personal details and your answers on the answer sheet provided.
- In each case provide the BEST answer.
- It is important to place the answers in the correct line.
- There are **5** questions in this **Sample** paper.
- In the real test you will have more questions, and one hour (**60 minutes**) to attempt as many questions as possible.
- The maximum number of marks in the real paper is **100**.
- The mark allocation is given on the Answer Sheet.
- You may ask your teacher to translate a question, but in all other ways the conditions are the same as for a formal examination.

Q1
Which number comes next in the sequence?
256; 128; 64; _____

Q2
NASA received three messages in a strange language from a distant planet. The scientists studied the messages and found that “Necor Buldon Slock” means “Danger Rocket Explosion” and “Edwan Mynor Necor” means “Danger Spaceship Fire” and Buldon Gimilzor Gondor” means “Bad Gas Explosion”. What does “Slock” mean?

a) danger
b) explosion
c) rocket
d) gas
e) none of the above

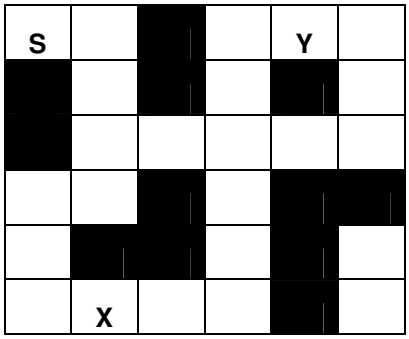
Q3
How many triangles, of any size, are there in the diagram below?



Q4
Gina is faster than Mpho, and Nora is slower than Gina.
Which of the following statements would be most accurate?

a) Nora is faster than Mpho.
b) Nora is slower than Mpho.
c) Nora is as fast as Mpho.
d) It is impossible to tell whether Mpho or Nora is faster.

Q5 Explanation
Imagine that you have found a maze in which is stored some treasure. Unfortunately, the people that created the maze may have left traps that could harm you, so instead you are going to send in a **robot** to fetch the treasure. The maze is shown below, with the two pieces of treasure marked as **X** and **Y**. Solid blocks show where walls are, and the clear blocks show where the robot could travel. **S** shows where you are.



Your job is to program the robot to walk through the maze, using the shortest route, collect the treasure, and bring it back. The commands you can give the robot are:

F - move forward one block
R - turn right
L - turn left
T - turn around (same as **L L** or **R R**)
P - pick up treasure
D - drop treasure

Initially the robot is at position **S** and is facing towards the top of the map. The robot can only pick up the treasure if it is on the same square of the map as the treasure. The robot must drop the treasure back at square **S**. As an example, here is how the robot would collect treasure **X** and bring it back to you:
R,F,R,F,F,F,R,F,L,F,F,L,F,P,
T,F,R,F,F,R,F,L,F,F,F,L,F,D

What commands would you need to program the robot with for it to fetch treasure **Y**, following the shortest route?