



# Computer Talent Search

A project of the Institute of IT Professionals South Africa

Ph: 021-448 7864 • Fax: 021-447 8410 • PO Box 13013, MOWBRAY, 7705 • info@olympiad.org.za • www.olympiad.org.za

## TALENT SEARCH 2014

- Please write your personal details and your answers on the Answer Sheet provided.
- Work through the explanations carefully to ensure that you understand the nature of the questions fully before attempting to answer the questions.
- You may answer the questions in any order. Leave the difficult questions for last.
- In each case provide the BEST answer.
- It is important to place the answers in the correct line on the Answer Sheet.
- There are 29 questions in this paper.
- You have one hour (**60 minutes**) to attempt as many questions as possible.
- The maximum number of marks is **100**.
- The mark allocation per question 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.

**1:** Which of the numbers 1, 3, 4, 7, 9, 13, 17 will add up to exactly 23? You may use a number once only.

**2:** Peter is shorter than Charles and Helen is taller than Charles. Who is the shortest?

**3:** FWAWWFA is to 9323392 as 3332292 is to .....

**4:** What is the maximum number of Fridays that can occur in the first 50 days of a year?

**5:** Use only ( ), [ ], +, -, x, or ÷ signs and four 5s to get to 1.

**6:** A clock strikes 6. It takes 15 seconds from the first strike to the last. How long will it take to strike 12?

**7:** Sally has an amount of money. She uses half to buy a cool drink and one third of the remainder to buy popcorn. She has R6 left. How much did she have to start with?

**8:** Mpho goes for a walk. She walks 1 km North, 1 km East, 2 km South and 1 km West. How far is Mpho from the starting point?

**9:** Which letter does NOT fit in the series?  
D F H J K L N P R

**10:** Sarah is 12, and twice as old as Peter. How old will Sarah be when she is one-and-a-half times as old as Peter?

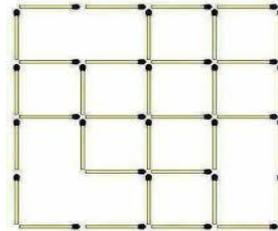
**11:** 60% of a crowd number 42. How many in the crowd?

**12:** If you write down all the numbers from 1 to 100 how many digits will you have written down?

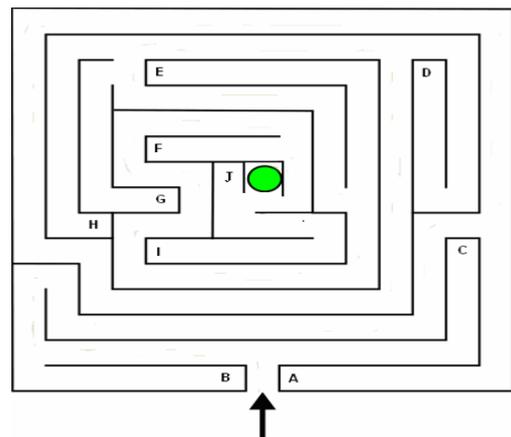
**13:** How many three-digit numbers can you make with the digits 1, 2 and 3? Include numbers like 111, 122, 331, etc.

**14:** A boy has as many sisters as brothers, but each sister has only half as many sisters as brothers. How many brothers and sisters are there in the family?

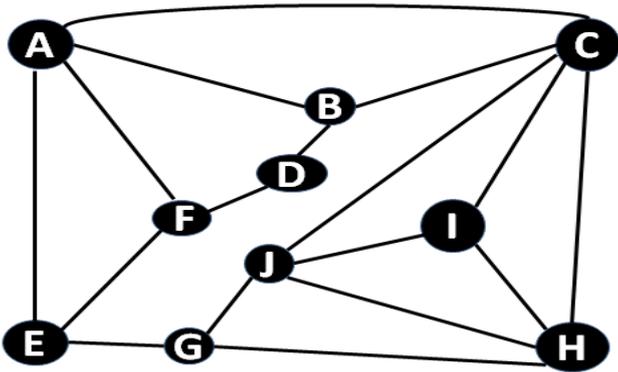
**15:** How many squares (of all sizes) in the drawing below?



**16:** One way to find your way in a maze is to use the “right-hand algorithm”, viz. keep your right hand against the wall and never stop touching the right-hand wall until you have reached your destination – in this case the spot in the middle. Each dead-end in the maze is marked with a letter, A, B, C, etc. Using the right-hand algorithm and starting at the point indicated by the arrow, how many dead-ends would you visit before reaching the spot in the middle?



17: What is the minimum number of cables that must be cut to interrupt communications between A and H?



18: A robot can move one square in each of four directions: up (code 0), down (code 1), right (code 2) or left (code 3). The robot was given the following sequence of instructions: 3, 0, 2, 0, 1. If the robot starts in the middle, on which block will it be after executing the sequence of instructions?

A	B	C	D	E
F	G	H	I	J
K	L	Robot	M	N
O	P	Q	R	S
T	U	V	W	X

19: A chess board is a square divided into 8 rows and 8 columns. A castle is a chess piece that can move in any direction horizontally or vertically. What is the maximum number of castles that can be placed on the chess board without two castles being in the same row or column?

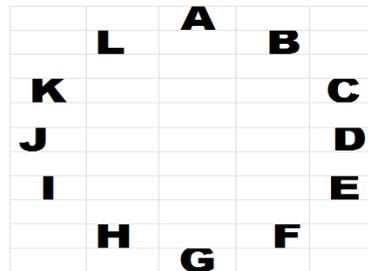
	a	b	c	d	e	f	g	h	
8				↑					8
7				↑					7
6				↑					6
5	←	←	←	♖	→	→	→	→	5
4				↓					4
3				↓					3
2				↓					2
1				↓					1
	a	b	c	d	e	f	g	h	

20: One block of cast gold is sufficient to make one ring. After making six rings there are enough gold fillings to melt and make another block. How many rings can be made out of 36 blocks?

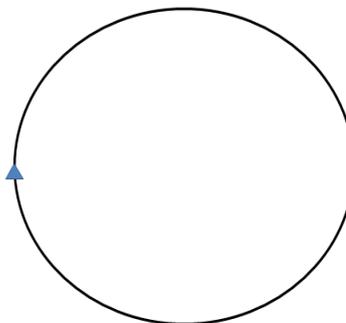
21: Five books are on a shelf in the order D, B, E, A, C. You have to put them in alphabetical order, but for each move you may only swap the places of two adjoining books with each other. E.g. your first move could be to swap E and A so that the shelf order is D, B, A, E, C. What is the minimum number of moves to get the order A, B, C, D, E?

<b>D</b>	<b>B</b>	<b>E</b>	<b>A</b>	<b>C</b>
<b>Title</b>	<b>Title</b>	<b>Title</b>	<b>Title</b>	<b>Title</b>
<b>Author</b>	<b>Author</b>	<b>Author</b>	<b>Author</b>	<b>Author</b>

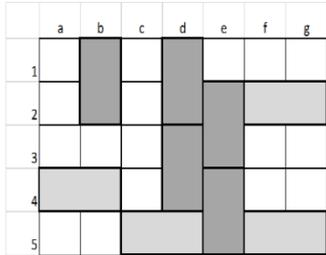
22: Charlene has 12 friends A, B, C, etc. to L, but only ten spare tickets to a rock concert. She makes all 12 of her friends stand in a circle as illustrated. Starting at A she counts, "one, two – ticket" which means that C gets a ticket and leaves the circle. She goes on with "one, two – ticket" till only two friends are left. Who are they?



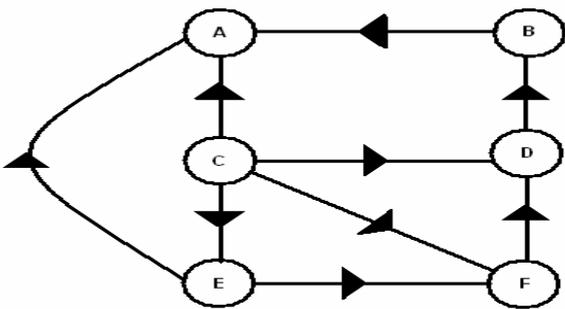
23: How many times must the robot execute [Forward 3 mm, Right 3°] to draw a complete circle?



**24:** We have a board with 35 squares on a 5 x 7 pattern. Vern and Helen play a game where they take turns to cover two squares at a time with domino tiles. Vern must place the tiles vertically and Helen horizontally. The winner is the last one to place a domino tile. The next move is Helen's. Including Helen's next move how many moves to end the game?



**25:** The City Council has made all the streets between A, B, C, D, E and F one-way streets. However, some of them point in the wrong direction. In order to make sure that every point can be reached from every other point what is the minimum number of streets which have to have their direction reversed?



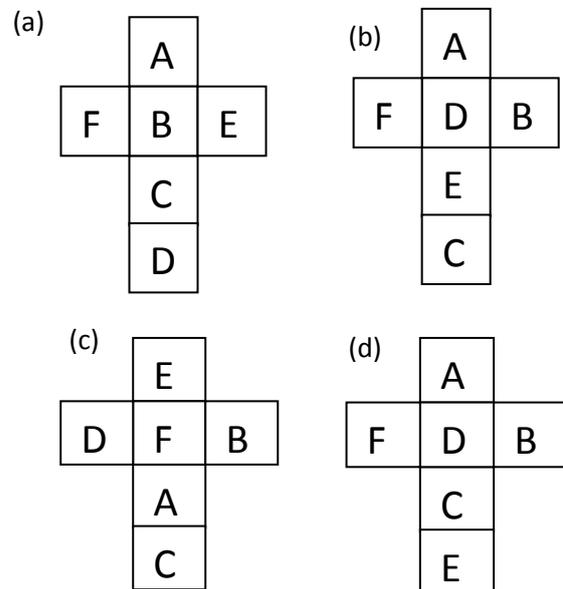
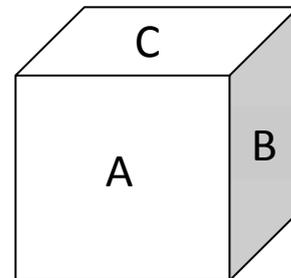
**26:** You are in charge of a suspension bridge over a deep ravine. You can allow groups of one, two or three people at a time to cross. No group can start before the previous group is across. People cross at different speeds, but you have to allow them on the bridge in the order in which they queue.

- Albert 1 min
- Bongani 18 min
- Charles 15 min
- Dingaana 16 min
- Evelyn 5 min
- Frans 2 min
- Georgina 18 min
- Helen 9 min
- Isaac 4 min
- Jacobus 7 min
- Kim 5 min

What is the shortest time all will be able to cross?

**27:** You have to guess a number between 0 and 11 (both included). After every guess you will get a response "too low", "too high" or "that is it". What is the smallest number of guesses needed to be sure you have the number?

**28:** Which one of the shapes (a), (b), (c) or (d) below will fold up to make the cube shown?



**29:** You have a choice of travelling from your starting point (Start) to your destination (End) using various toll roads. How much toll will you have to pay if you choose the cheapest route?

