

**TEST FOR SELECTING STUDENTS TO REPRESENT SRI LANKA AT THE  
INTERNATIONAL MATHEMATICS & SCIENCE OLYMPIAD COMPETITION - 2015**

**Category I**

INDEX NO - 2015/N/I/

**General Instructions**

This paper consists of two parts. Answer all questions in both parts

Part A - 15 short questions ( 04 marks for each correct answer )

- Answer should be written on the questions paper itself.

Part B - 05 essay type questions ( 08 marks for each correct answer)

- You should provide a descriptive answer step by step for each question and write on the papers provided.
- No marks awarded for answers that are not clear.

The figures given may not drawn to scale.

**Time – 2 hours**

**Part A**

- (1) Write the value of  $\frac{200-180+160-140+120-100+80\cdots-20}{500-450+400-350+300-250+200\cdots-50}$  as a real fraction.

Answer .....

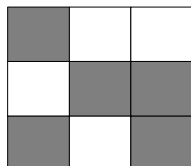
- (2) In a group there are 7 Mathematicians, 3 Musicians, 4 Thai citizens, 2 kings, 4 ladies, 2 Thai Musicians and 5 Sri Lankans. What can be the minimum number of persons in this group?

Answer .....

- (3) In a queue the 17<sup>th</sup> from front end is a gent and 17<sup>th</sup> from the tail end is a lady. Between this two persons there are 5 people in the queue. Number of gents in the queue is 14 and it is greater than the number of ladies in the queue. How many people are there in the queue?

Answer .....

- (4) Out of the 14 squares in different sizes, only 5 small squares are coloured as shown in the diagram. How many squares which are symmetric about both diagonals can be seen in the diagram?



Answer.....

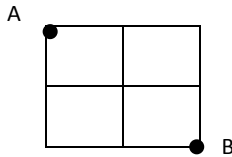
- (5)  $\frac{3}{4}$  of passengers are gents and  $\frac{2}{5}$  of passengers are older than 50 years. The maximum value it can be existed for the number of ladies who older than 50 years is 80. How many gents that 50 years or below 50 years in age are there?

Answer .....

- (6) How many deferent pairs of 4 digit numbers, such that the deference between 2 numbers of a pair is equal to 2015, are there exist?

Answer .....

- (7)



Nimal wants to go from point A to point B along the lines without passing the same point twice. How many deferent paths can be selected by Nimal to fulfill his target?

Answer .....

- (8) If some amount divided among A, B, C in the ratio of 2: 5: 3 respectively instead of the previously decided ratio of 1: 3: 4, B got 5 Rupees more than the previous amount. How less the amount that C got compare to his previous amount?

Answer :Rs.....

- (9) There are only cars and jeeps in a vehicle park.  $\frac{1}{5}$  of these vehicles are cars. If another 12 jeeps would be parked, number of cars would become  $\frac{1}{7}$  of the vehicles. How many cars are there?

Answer .....

- (10) Without breaking any tile, how many  $4\text{cm} \times 4\text{cm}$  tiles in minimum are required to replace the  $4.5\text{cm} \times 4.5\text{cm}$  tiles which cover plane surface?

Answer .....

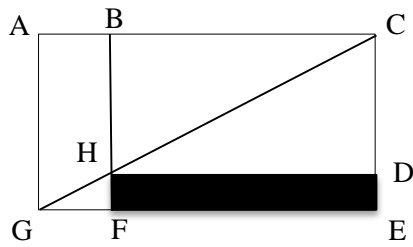
- (11)

$$\begin{array}{r} \phantom{+} \phantom{D} \phantom{H} \phantom{I} \phantom{J} \\ \phantom{+} \phantom{D} \phantom{H} \phantom{I} \phantom{J} \\ + \phantom{D} \phantom{H} \phantom{I} \phantom{J} \\ \hline \phantom{D} \phantom{H} \phantom{I} \phantom{J} \\ \hline \hline \end{array}$$

A, B, D, F, G, H, I & J are different digits such that none of A, B, D or G is 0 and  $A < F$ .  
Find the sum denoted by GHIJ?

Answer.....

(12)

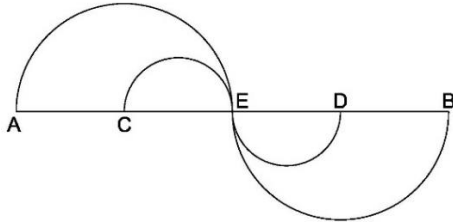


ACEG is a rectangular and  $CE = 6\text{cm}$ ,  $BH = 4\text{cm}$  and the shaded area is  $20\text{cm}^2$ .

BF parallel to the AG and HD parallel to the FE. Find the length GF.

Answer.....cm.

(13)

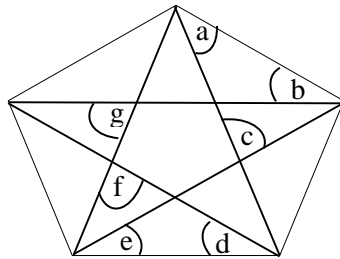


This drawing consists of four half circles and straight line.

If  $AE = CD = EB = 2CE = 28\text{cm}$ , what is the total length of the lines of the drawing?

Answer.....

(14)



What is the total of the angels a, b, c, d, e, f and g ?

Answer.....

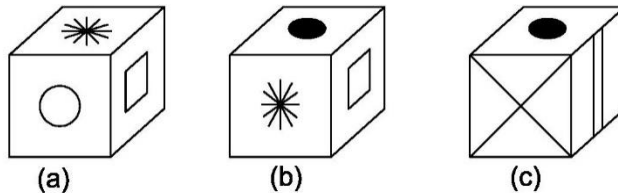
(15) Nimal wrote number of cansesutive whole numbers. Sheela copied those numbers, erased the smolest number and got the average of remaining numbers. Nimal erased the largest number and got the average of remaining numbers. What is the defference between the avareges calculaterd by Sheela and Nimal?

Answer.....

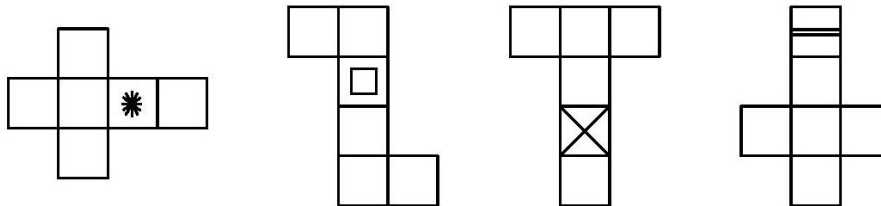
## Part B

(The answers should be written step by step in the given paper)

01. Damayanthi wants to write a numbers such that the average of any adjacent two digits are equal. How many such 4 digit numbers can be written by her?
02. A cube in different angels are shown by the figures (a), (b) and (c)



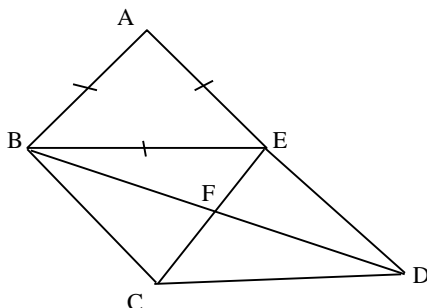
Suppose that the 4 blokes given below are deferent blokes of such similar cube.



Only one relevant face is marked in each blokes. Draw those 4 blocks and complete the diagrams by marking every faces (boxes) with relevant figures.

03. Three straight cuts separated the spherical shape bun into maximum number of similar pieces. The bun was not separated into pieces until apply the last cut.
- (a) How many pieces of bun were there after 3 straight cuts?
- (b) By applying butter on a plane face of a piece, two pieces can be pasted together. All together at least how many feces of the pieces should be applied butter on it to make a spherical shape bun again.
04. Seetha left home 15minutes earlier than usual day to avoid traffic on the way to her office, and reached office 25minutes earlier than usual day. As she could increase her average speed by 10km per hour she spent only 45minutes to reach her office on that day. What is her average speed on that day?

05.



Find  $\hat{BCD}$  where,

$$AB = BE = EA = 2EF = 2FC \text{ and } 2\hat{ABD} = 3\hat{BAE}$$