
KA 53 MD 8

Inquizitive Finals

March 4th, 2017

- 6 Teams | 12 Questions
- Questions pass-on in Round Robin
- Correct: + 15

  Incorrect: - 10

  Pass: - 05

Q1

A number is formed by concatenation of first **60** positive integers

N = 12345678910111213 14…585960

You can remove any **100 digits** from **N** without rearranging the remaining digits, and call the remaining number as **M**

What is the largest possible value of **M** ?

Q2

Representing a **TRUE** statement by **1** and a **FALSE** statement by **0**, a binary number will be formed by given **5 statements**

You need to tell the **decimal equivalent** of the number

1. Statement 2 and Statement 5 are either both true or both false
2. Statement 3 and Statement 5 are either both true or both false
3. Exactly two of the statements are true
4. Statement 1 and Statement 2 are either both true or both false
5. Statement 3 is false

Q3

Integers are listed from **1 to 9001**

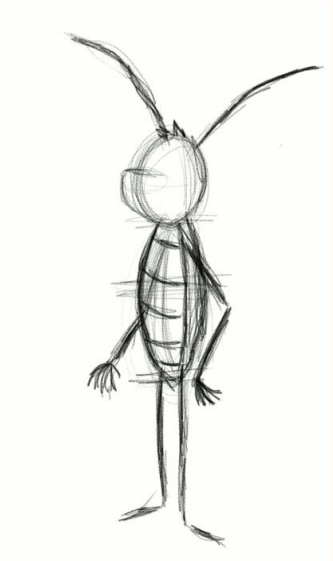
You need to find **a + b** ?

where

a is the digit wrote the most number of times

b is the digit wrote the least number of times

Q4



- Lakshmi and Aadirupa stand at ends of a long straight line
- Lakshmi sends **50** cockroaches towards Aadirupa, one after another, while Aadirupa sends **20** cockroaches towards Lakshmi
- All cockroaches travel along the straight line segment
- Whenever two cockroaches collide, they simply **bounce back** and start traveling in the opposite direction

How many cockroaches reach Lakshmi and how many reach Aadirupa?

How many collisions?

Q5

$\mathbf{a = b^2 = c^3 = d^5}$ where a, b, c, d are distinct integers

Find smallest possible **a** ?

Q6

Given a positive integer **n**, let **P(n)** be the product of the non-zero digits of n.

In case n is a single digit number, P(n) is equal to n.

Let **S = P(1) + P(2) + … + P(999)**

What is the largest prime factor of **S**?

-- Audience Question --

A function is defined on non-negative integers- **A(m, n)**

-> Its a very strange function as **A(4, 2)** is a 19,729 digit number

$$A(m,n) = \begin{cases} n+1 & \text{if } m = 0 \\ A(m-1,1) & \text{if } m > 0 \text{ and } n = 0 \\ A(m-1, A(m,n-1)) & \text{if } m > 0 \text{ and } n > 0. \end{cases}$$

What is **A(3, 6)** ?

-- Audience Question --

What is the number of leaf nodes in a rooted tree of **100** nodes with each node having **0 or 3 children** ?

Q7

There are **n** people, each of which has a piece of information

They only communicate in pairs
Whenever two of them communicate they share their current knowledge

What is the min no. of communications needed in a group of **n = 9** after which everyone knows everything?

Q8

Out of **n** people in a party, **one is a celebrity**

Picking any 2 people, A and B

Only question you can ask is "**Does A know B?**"

Everybody knows the celebrity

The celebrity knows none

In what min no. of questions, you can figure out the celebrity?

Q9

There is a very big dairy milk chocolate of **size** **m** x **n**

You **can** make horizontal/vertical cuts breaking a piece into two

You **cannot** cut through through two pieces in one go

Minimum no. of cuts needed to separate all **1** x **1** pieces?

Q10

Three friends Raju, Shyam and Babu Rao were discussing about Leonardo

Raju says, “Leonardo made **at least** four paintings of Mona”

Shyam says, “No, he made **less than four** paintings of Mona”

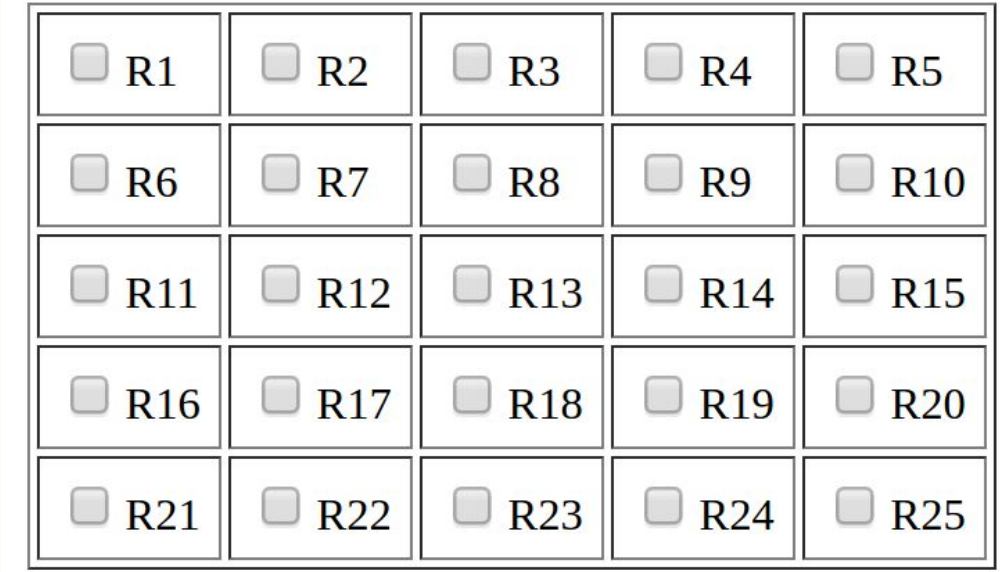
Babu Rao said, “What I can say is that, Leonardo made **at least one** Mona”

How many paintings of Mona did Leonardo make? :P

provided you know that **exactly one** of them is correct

Q11

These are **25** light bulbs. Each bulb **also** toggles its **4** neighbours.



A sequence of moves to **turn ON all** ?

Q12

One fine night, **4** people came to cross a wide river. There is a narrow bridge which can only hold **at most 2** people at a time. They have one torch and because it's night, the torch has to be used whenever crossing the bridge. All 4 have different walking speeds.

Person A can cross the bridge in **1** minute

Person B in **2** minutes

Person C in **5** minutes

Person D in **8** minutes

When two people cross the bridge together, they must move at the slower person's pace

Minimum time required for all of them to cross the bridge?

-- Audience Question --

Priyanka is an avid collector of stamps

She is trying to arrange her collection of stamps into neat **rows of equal sizes**

She tries to arrange them in row of **2, 3, 4, 5, 6 or 7**, she always ends up **1 short**

What is **min no. of stamps** she has?

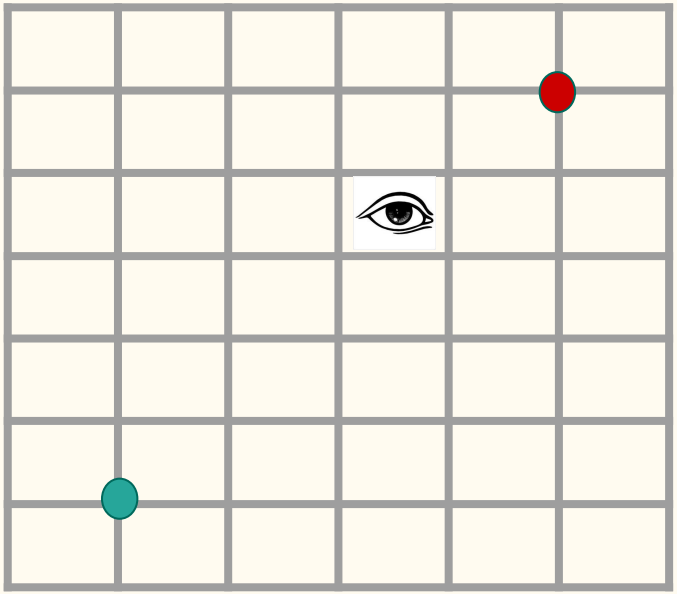
Tie Breakers

Find the sum of all the prime numbers less than 1000 that are 1 more than a perfect square.

Person 1 said, "2 stole the wallet."
Person 2 said, "3 didn't steal it."
Person 3 said, "I didn't steal it."
Person 4 said, "3 stole your wallet."

Who has stolen if exactly 3 of them lied?

Q Extra



Moving closer to the target in every step

You made a **random round trip** between these points

Probability that the eye saw you at least once?