

General Instructions:

- This question paper consists of 6 sections with a total of 26 questions.
- You are required to fill your basic details - **roll number, email id and phone number** in **section 1** with utmost care.
- The **marking scheme** is given in **Section 1**, one of the unique schemes you might ever experience.
- No ambiguity related to the marking scheme will be entertained later.
- If any discrepancy in the paper is found, the final decision regarding the same will be taken by Team Technothlon.
- Integer type answers can have any integer value (NOT restricted to 0 to 9)
- The Marking scheme given for the particular question on the screen shall **not** be considered for evaluation and the marking scheme given in **section 1** shall be considered for evaluation.

Example: the marking scheme of the question on screen is +4/0 but for evaluation we will consider the marking scheme that is mentioned in **Section 1**.

- Please ignore the auto-generated leaderboard/marks (If any) . You will get the prelims results on the Technothlon home page [https:// technothlon.techniche.org.in/](https://technothlon.techniche.org.in/), where you registered for the test.

Selection Criterion and Result:

- The ranking will be based on the total marks obtained in all the sections.
- The result will be declared on or before August 8th, 2023 on our website technothlon.techniche.org.in.
- To check your result, log in with the Roll number and password provided via email.
- The top 50 participants from your squad will be invited to IIT Guwahati for the Mains and will be awarded Gold certificates.
- The next 200 will be awarded Silver certificates.

Section 1**QUESTION 1**

Our story starts with Peter Parker introducing himself as we know him, the friendly neighbourhood01 Spider-Man. By now, everybody knows how big he is, what with saving New York constantly, getting his own comics, cereal, and even a Christmas album. He does have some things he's not proud of (the emo dance, for one), but he takes his duties as Spidey proudly, as he is the one and only.

We meet Brooklyn teen Miles Morales as he is getting ready to start attending a private school. He lives with his father Jefferson and his mother Rio. Miles goes around his neighbourhood greeting his friends and tagging street signs with stickers he made. Jefferson, a cop, catches Miles and escorts him to school in his cruiser.

Main Character

Miles Morales / Spider-Man: An intelligent and rebellious teenager of African-American and Puerto Rican descent, who is imbued with spider-like abilities after being bitten by a radioactive spider and eventually takes up the mantle of the masked vigilante Spider-Man.

Side Characters

Peter B. Parker / Spider-Man: Miles' reluctant mentor, a disheveled, jaded, and brown-haired 38-year-old counterpart of the hero from another dimension.

Gwen Stacy / Spider-Woman: A dimension-displaced counterpart of Gwen Stacy with spider-like abilities, who takes up the alias of "Wanda" (mistaken as "Gwanda") while at Miles' school. She is referred to as "Spider-Gwen".

Jefferson Davis: Miles' African-American father, a police officer, who disapproves of Spider-Man's vigilante actions.

Aaron Davis / Prowler: Miles' uncle, who moonlights as a masked enforcer for Wilson Fisk while keeping it a secret from his family. He is rebellious, causing him to be looked at poorly by Jefferson.

May Parker: Peter's aunt, who is dead in Peter B. Parker's universe, and provides refuge for the other Spider-People in Miles' universe.

Peni Parker: A young Japanese-American girl from an alternative anime-like universe who copilots a biomechanical suit with a radioactive spider that she shares a telepathic link with.

Doctor Olivia "Liv" Octavius: The head scientist and CEO of Alchemax, and a scientific adviser to Wilson Fisk. The character uses highly advanced tentacles and is featured in much of the marketing for Alchemax, even being seen in a documentary by Miles in school.

Main Villain

Wilson Fisk / Kingpin: A crime lord and the leader of Alchemax in Miles' dimension. His ultimate motive is to resurrect his dead wife and son, who died in a car crash escaping from him.

Marking Schemes

Power Sequence (This marking scheme is applied to section 2)

Power Scheme: With negative marking

For consecutive correct questions, you will be awarded 21, 22, 23 and so on.

However, if you leave a question or answer it incorrectly, the sequence is broken, and you will start again from 21.

If you answer the question incorrectly your marks will be deducted in the same pattern but different sequence

E.g. Solving 4 questions,

For all correct you get $2+4+8+16 = 30$

For all incorrect you get $-1-2-4-8 = -15$

For RRWW you get $2+4-1-2 = 3$

For RWRW you get $2-1+2-1 = 2$

For WRWW you get $-1+2-1-2 = -2$

For RRUW you get $2+4+0-1 = 5$

And so on.

(R -> right answer, W-> wrong answer, U-> Unattempted)

Affinity In A Row (This marking scheme is applied to section 3)

Q1, Q2, Q3 have marks 2, 4, 6 and so on respectively BUT

There are two conditions:

There would be no reduction in the marks of this section if you solve 2 consecutive questions correctly

Also, If the above criteria is not met alongside you solving a question incorrectly, the total marks you have scored in this section are halved.

For example :

For a 3 question section-

If you solve Q2 and Q3 correctly but Q1 incorrectly or leave it unattempted

then you will get $0 + 4 + 6 = 10$ marks.

If you solve Q1 and Q3 correctly but Q2 incorrectly or you have not attempted it, then you will get $(2 + 0 + 6)/2 = 4$ marks.

Similar rules are applied for a section containing 4 questions with the last question having 8 marks.

Similar rules are applied for a section containing 5 questions with the last question having 10 marks.

Shield Me (This marking scheme is applied to section 4)

You get 5 marks for answering correctly and 4 marks are deducted for answering incorrectly, but if you have solved the previous question correctly, then there is no negative marking for the current question.

For example:

If Your sequence is RWRW, then your score is $5+0+5+0 = 10$

But if your sequence is RWWR, then your score would be $5+0-4+5 = 6$

And if your sequence is RWUW, then your score is $5+0+0-4 = 1$

Where (R -> right answer, W-> wrong answer, U-> Unattempted)

Arithmetic Game (This marking scheme is applied to section 5)

You will be awarded 2,4,6,8 for consecutive correct answers and a negative of -1,-2,-3,-4 for incorrect answers.

For example:

If Your sequence is RRRW, then your score is $2+4+6-4 = 8$

But if your sequence is RWRR, then your score would be $2-2+6+8 = 14$

And if your sequence is WRUR, then your score is $-1+4+0+8 = 11$

Where (R -> right answer, W -> wrong answer, U -> Unattempted)

Bonus Questions

There are some bonus questions to boost your score in the competition.

The Bonus question is applicable only if the previous question is correct and the marks of the bonus question will be the same as the score you obtained in the previous question.

There is no negative marking for the Bonus Questions.

Note: Bonus Questions are not included in the marking scheme.

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It is assumed that you have read the instructions properly and Best Of Luck!!

Enter Your Technothon'23 Roll Number. Enter the digits after HE..... or JE.....

(Roll Number was shared via your registered email address. Kindly check the Spam Folder)

(Fill it very Carefully)

Answer.....

QUESTION 2

Enter Your Technothlon'23 registered Phone Number (10 Digits) .

(Phone number on which you received the OTP)

(Fill it very Carefully)

Answer.....

Section 2

QUESTION 3

Along the way to Miles's school, there are 6 stations in a circular path starting numbered from 1 to 6 in a clockwise manner. Each station has a certain amount of gas increasing in the Fibonacci number pattern from stations 1 to 6. Jefferson says to Miles that they must use a certain amount of gas while going to the next station which is increasing in a lucky number pattern where the first number of the series indicates the gas required to move from station 1 to 2. Which station (having the least value) should they start from to reach the same station after a round trip with a minimum amount of fuel left at last in a clockwise manner?

Fibonacci series – Next element is the sum of the previous two elements. Use 2 and 3 as the first 2 elements.

Lucky Series (Up to 6 elements) – 1,3,7,9,13,15

- A. 1
- B. 3
- C. 5
- D. 6

QUESTION 4

Bonus Question (only applicable if previous question is correctly answered)

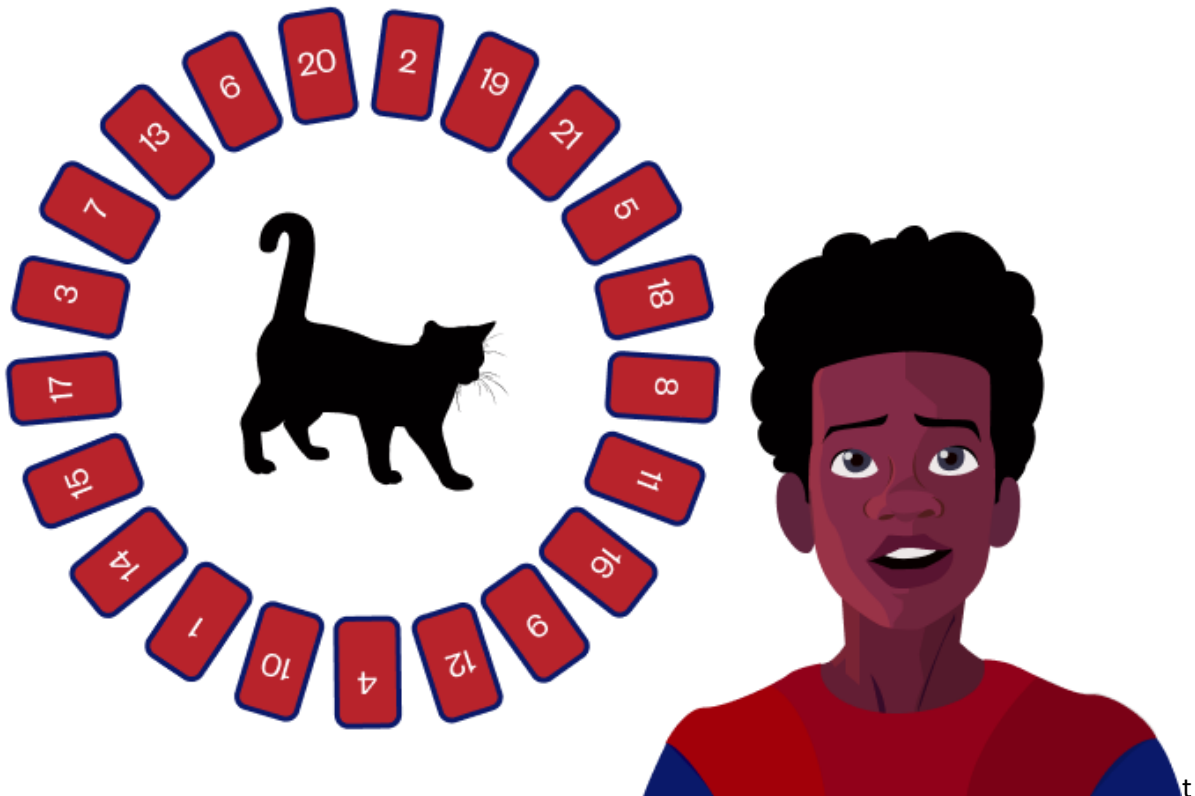
What will be the answer in case of an anti-clockwise manner?

- a. 1
- b. 2
- c. 3
- d. 6

QUESTION 5

As they ride to the school, they see a news report on Spider-Man, whom Jeff is not a fan of. Once they arrive, Jeff tells Miles he loves him, but Miles fails to say it back. Jeff then uses his radio to force Miles in front of all the other students to say "I love you" back, embarrassing him. Miles gets into his schoolwork as he tries to adjust to this new environment. During one of his classes, he meets Gwen Stacy, who doesn't immediately tell him who she is. They become friends and during breaktime Miles suggests they play a card game. He then goes on to explain the rules to Gwen.

Twenty Cards with a unique number from 1 to 20 are placed in a circular and random arrangement. The player can start from any card, calling that card 'one,' and count, 'one, two, three,' etc., in a clockwise direction, and when your count agrees with the number on the card, you have made a 'catch,' and you remove that card. Then start at the next card, calling that 'one,' and try again to make another 'catch.' And so on.



Miles then adds that Gwen is allowed to swap any two cards before the start of the game, to maximize the number of catches. Which option is incorrect where swapping cards is matched with the correct number of matches.

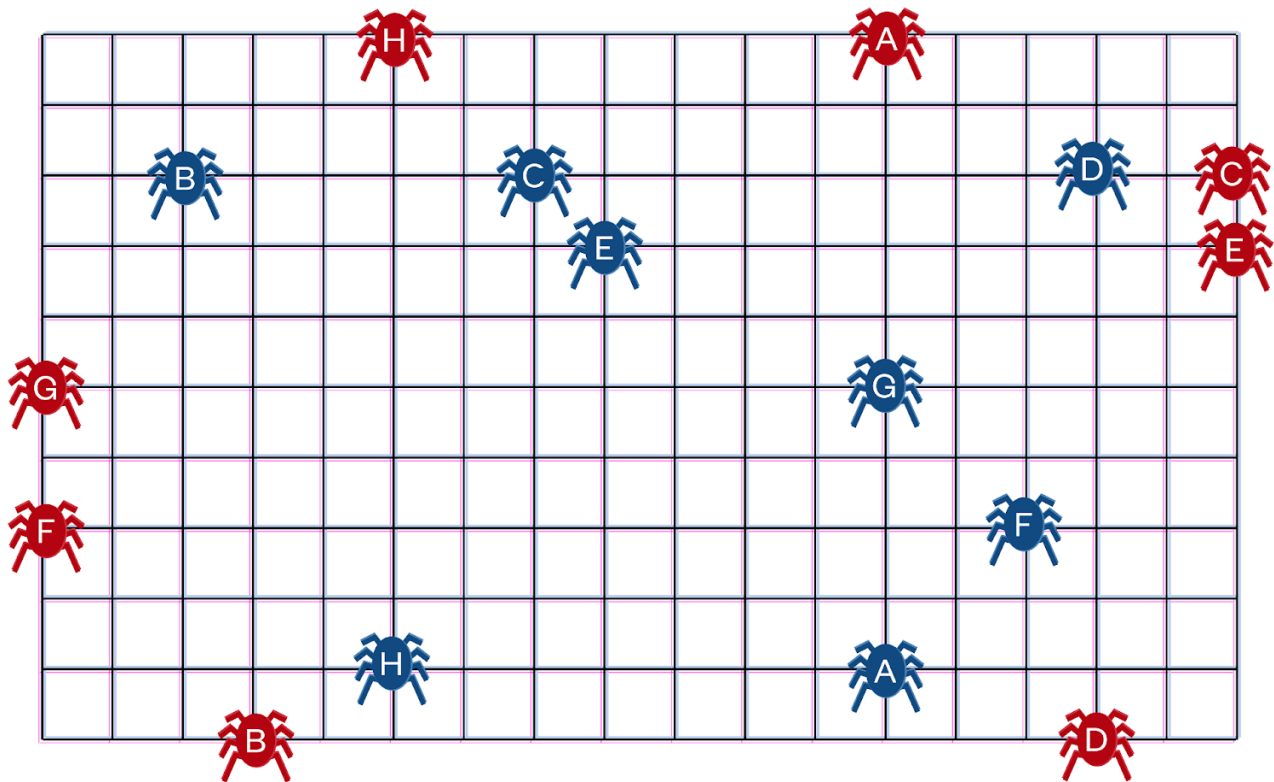
- a. 6 and 13 with 21 catches
- b. 12 and 20 with 21 catches
- c. 10 and 14 with 21 catches
- d. 6 and 8 with 21 catches

QUESTION 6

After school is over. Miles reunites with his friends at the football pitch. They play normally for a while and soon their coach arrives. Daily he makes the players follow a strict warmup procedure in which positions the 8 players, let's say

named A, B, C, D, E, F, G, and H for convenience on the field as given in the diagram. The players must reach their assigned positions so that they do not intersect the path of another player. There are several paths for each player to reach their destination (Starting from the blue blocks and ending in red). Keeping in mind that every player starts simultaneously, that is they don't know the path of another person initially, how many turns each of the person will take after starting in a particular direction. Or how many times each person will change their direction after starting in a particular direction.

Note: The black lines in the grid represent the path available for the players to move along.



Options represent the turns taken by people named from A to E (in Order).

- A. 8, 0, 4, 3, 5, 4, 5, 8.
- B. 7, 2, 4, 3, 5, 4, 3, 8.
- C. 8, 1, 3, 3, 5, 4, 5, 8.
- D. 8, 2, 4, 3, 5, 4, 5, 8.

QUESTION 7

After finishing a grueling day at the football pitch, later that day, Miles sneaks out of his dorm to visit his Uncle Aaron, who is Jefferson's brother and a sort of black sheep due to his criminal activities. Aaron then tells Miles about a horse racing competition. Each year 6 horses are chosen to join the competition among 15 total horses. Now Aaron explains he's betting on which horses the competition runners are going to select and if he guesses at least 3 horses correctly his guessing is said to be *accurate*. Aaron is smart and has an optimal strategy for guessing. How many times at most would Aaron have to guess, such that at least one guess is *accurate*?(Integer Type)

Answer

Section 3

QUESTION 8

Meanwhile Miles tells him about Gwen, and Aaron tells him to do a shoulder touch to try and charm her. The two then go to the tunnels near the subway so that they can do some graffiti since Aaron is fond of Miles's artwork. As Miles spray-paints the walls, a radioactive glitching spider crawls up his leg and bites his hand after Miles takes a picture of his work, but he only lightly taps the spider off his hand before leaving with Aaron.

The next day, Miles finds himself feeling differently. He hears a voice in his head (which is accompanied by comics-style text boxes), his clothes barely fit, and he is sweating profusely. He runs into Gwen, who tries to make up a fake name when they properly introduce themselves. Miles tries to do the shoulder touch, but he only gets his hand stuck on Gwen's shoulder, and then her hair, leading them to have to go to the nurse for her to cut her hair off.

During class, the teacher spots Miles and Gwen arguing in class so he picks both Miles and Gwen to solve the equation written on the class board. There is a subtraction equation written on the board, with four digits minus four digits, and the first digits both fixed. Miles and Gwen need to fill in the remaining 6 digits (A~F below) using 6 turns to complete the equation. On each turn, Miles chooses a number from 0~9 (excluding 1 and 2, since they are already used) given to Gwen, then Gwen chooses a digit space to put in the number given.

Miles's goal is to make the final difference as large as possible, and Gwen's goal is to make the final difference as small as possible. If both use the optimal strategy and the six numbers Miles chooses must be non-repeatable,

What is the final difference?

2 A B C

- 1 D E F

- A. 1149
- B. 1333
- C. 1953
- D. 667

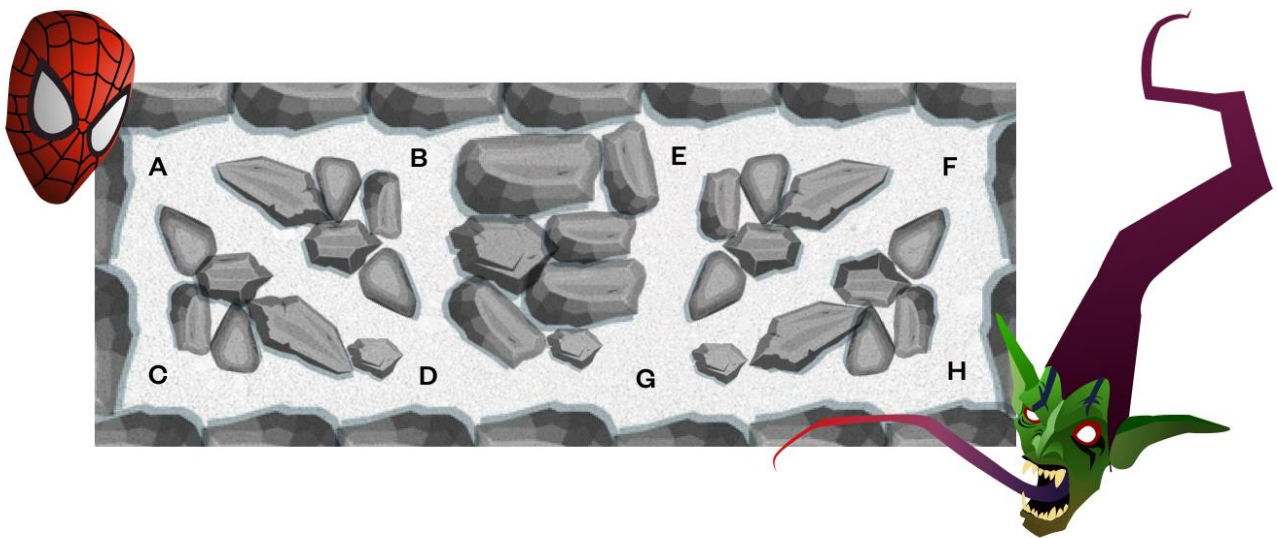
QUESTION 9

They somehow manage to get the right answer and the teacher ends the class after that. After class when Miles tries going back to his room, he is found by a security guard who calls him out for leaving his dorm. Miles runs and hides in the man's office, getting everything stuck to him as he keeps freaking out. He climbs out the window and finds himself walking on the walls before running into the streets, amazed by his newfound powers and abilities.

Miles later goes to the tunnel where the spider bit him. As he examines it, it starts glitching again. Not long after, Miles hides as his spider-sense detects danger. Spider-Man enters as he's being pursued by the Green Goblin. The fight takes them beneath Fisk Industries where Wilson Fisk/Kingpin is attempting to start up a Super Collider. In the middle of Spidey fighting Goblin, he takes the time to get Miles out of harm's way.

In between their fight Peter and the Goblin are trapped in a maze. The maze is a series of caverns connected by passages. Peter managed to smuggle into the labyrinth with him a supply of candles and a small tube of phosphorescent paint with which he could mark his way, or, more specifically, the exits he used. He knew that he would be lowered into a passage between two caverns, and that if he could find and kill the Goblin he would be set free. His intended strategy was to move cautiously along a passage until he came to a cavern and then turn right (he was left-handed and wished to keep his sword away from the wall) and feel his way around the edge of the cavern until he came to an exit. If this was unmarked, he would mark it and enter it; if it was marked he would ignore it and continue around the cavern. If he heard the Goblin in a cavern with him, he would light a candle and kill the Goblin, since the Goblin would be blinded by the light. If, however, he met the Goblin in a passage he would be in trouble, since the size of the passage would restrict his movements and he would be unable to either light a candle or fight adequately. When he entered a cavern that had been previously entered by the Goblin he would light a candle and leave it there and then turn right (as usual) but take the Goblin's exit. In the meantime, the Goblin was also searching for Peter. He was bigger and slower-moving but he knew the caverns well and hence, unlikely as it may seem, every time he emerged from a passage into a cavern, so did Peter, albeit usually in a different one. The Goblin turned left when he entered a cavern and traveled clockwise around it until he came to an unmarked (by him) exit, at which point he would mark it and take it. If he sensed that the cavern he was about to enter had a candle burning in it, he would turn and flee back up the passage he had just used, arriving back at the previous cavern to complete his 'turn'.

The given labyrinth is



If Peter is lowered between A and C and Goblin is lowered between D and G then which of the following is correct?

- A. The Goblin is slain in H
- B. Peter is killed between D and G
- C. The Goblin is slain in G

- D. Peter is killed between E and G

QUESTION 10

Bonus (only applicable if the previous question is correctly answered)

If Peter is lowered between A and C and Goblin is lowered between F and H then which of the following is correct?

- A. The Goblin is slain in H
- B. Peter is killed between D and G
- C. The Goblin is slain in G
- D. Peter is killed between E and G

QUESTION 11

After exiting the maze Peter is now captured by Kingpin and another villain, The Prowler. Soon Peter realizes Miles is just like him, just as the machine is turned on. Outside in the city, certain structures start to get weirdly morphed into other shapes. A blast occurs in the tunnel. Spidey is badly injured, and Miles tries to help him, but Spidey tells him to hide before giving him a drive to shut down the Collider. Kingpin and The Prowler, gather around Spidey and remove his mask. He begs Kingpin not to restart the Collider, even telling him to think about his family, but this angers Kingpin and he kills Spider-Man by slamming his fists down onto him, which Miles watches in horror. He runs back home where his parents find him, and he runs to hug Jefferson.

The news breaks out that Spider-Man is dead, and that he was Peter Parker. New Yorkers everywhere are devastated. Miles buys a costume before attending a memorial service for Peter, with many other fans attending dressed as the wall-crawler. Mary Jane delivers a eulogy for her husband while Aunt May stands solemnly in the back. Miles is inspired by MJ's words to take up the mantle of Spider-Man. He wants to test out his powers, but he isn't quite sure of how to get them to work.

Next day during math class, Miles is tested by his Maths teacher who gives him the following riddle

A festival is celebrated on that Sunday which is as many Saturdays after the first Tuesday in February as the last digit in the year or the last digit but one in the year whichever is greater, unless it is a leap year in which case it shall be one Sunday later than it would be in a normal year.

What is the date of the festival in 1972?

- a. 25th March 1972
- b. 18th March 1972
- c. 2nd April 1972
- d. 26th March 1972

QUESTION 12

Bonus Question (Only applicable if answer to the Previous Question is correct)

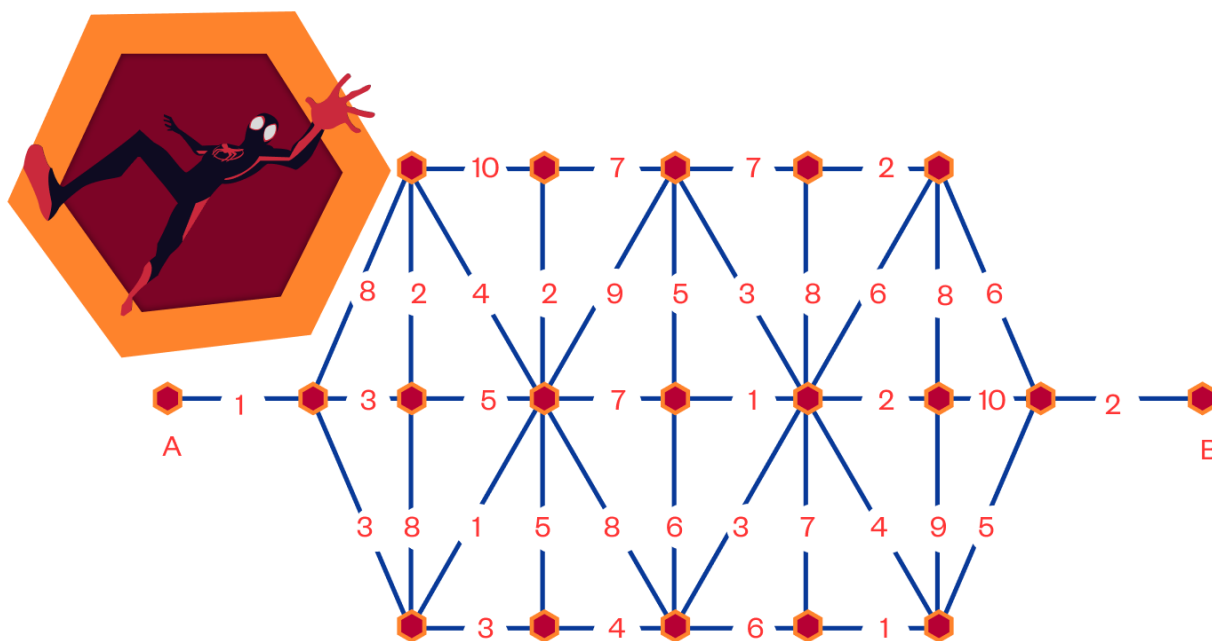
When was the last year (before 1972) when it was celebrated in February?

- a. 1956

- b. 1949
- c. 1943
- d. 1938

QUESTION 13

Miles, intelligent as he is, answers the question correctly. Later that day Miles pays a visit to Peter's grave, just as he is spotted by another man...Peter B. Parker. In his own words, this Peter tells us that in his universe, he's been Spider-Man for years and is now an adult, but he's lost Aunt May and he was married to Mary Jane but is now divorced due to him not being able to work out his issues as Spidey, as well as him not wanting kids when she did. He became depressed and gained weight, and then the Collider turned on, which pulled him into this dimension.



Now after finding Miles, he gets knocked unconscious, leading Miles to try and swing away with him as the police go after them. To escape from the police both of them have to go from A to B and there are many different paths to do so. Every path takes different times (in minutes) as shown. In how much minimum time can Peter and Miles reach from A to B to escape from the police. **(Integer Type)**

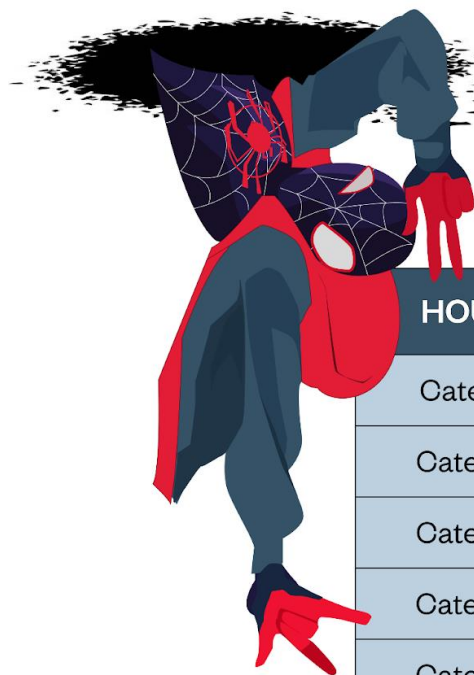
Answer.....

QUESTION 14

They escape from the police and Miles brings Peter somewhere for safety. He questions Peter as to how it's possible that he's there alive when he correctly guesses the alternate dimension theory. Miles takes out the drive that the Peter of his universe gave him (which other Peter calls a "goober"), but it's broken. Peter frees himself and takes the broken goober to try and find a new one so that he can get back home, as being in this dimension causes him to glitch and be unstable. However, before Peter can head off on his own, Miles guilties him into letting him join so that they can make things right together. Miles and Peter, dressed in their costumes, go to Alchemax Labs where the data on the Collider is being kept. As they try to find a way to sneak in, Kingpin and his henchman Tombstone and his top

scientist. Kingpin's motive for operating the Collider is to be reunited with his wife Vanessa and son Richard. Years earlier, they watched as he tried to kill Spider-Man, and they fled from him, only to be tragically hit by a truck.

As they enter the secret room they are presented with a riddle in order to unlock the elevator. It is as follows



HOUSES	1	2	3	4	5
Category 1					
Category 2					
Category 3					
Category 4					
Category 5					

Category 1: White ,Black ,orange,yellow, violet
(Colors)
Romeo y Julieta ,Padron,Arturo
Fuente (Cigars)

Category 2: Cohiba, Montecristo,

Category 3: Canadian , American,Mongolian,Norwegian ,Indian
(Nationality)
,Tiger (Pet)

Category 4: Pigeon, Dog, Cat ,Sheep

Category 5: Mojito ,Coca-Cola, Guinness ,Margarita ,Martini (Drink)

- Canadian lives in orange house
- Indian keeps Cat as Pets
- American drinks Margarita
- black house is exactly left to yellow house
- Owner of black house drinks Coca-Cola
- Person who smokes Padron rears Pigeon
- Owner of violet house smokes Romeo y Julieta
- Man living in central house drinks Martini
- Norwegian lives in the first house

- The man who smokes Cohiba lives next to one who keeps Dog
- The man who keeps Sheep lives next to the man who smokes Romeo y Julieta
- The man who smokes Montecristo drinks Mojito
- Mongolian smokes Arturo Fuente
- Norwegian lives next to white house
- The man who smokes Cohiba has a neighbor who drinks Martini.

Use the Clues and answer the following questions.

In which Colour house Cat resides?

- a. Black
- b. Orange
- c. Yellow
- d. white

QUESTION 15

Bonus Question (Applicable only when the previous question is correct)

Which nationality person lives left of the person who owns Tiger?

- a. Canadian
- b. American
- c. Norwegian
- d. Mongolian

Section 4

Question 16

Peter and Miles use their quick thinking to solve the riddle correctly and it gives them access to the elevator. There are 85 floors in the tower and a single elevator to travel from one floor to another. There are no stairs. The elevator has some mismatch of wires due to which it can move exactly 7 floors upwards only if there are enough floors available. Also it can move exactly 9 floors downwards only if there are enough floors available. The elevator takes 34 seconds to reach the next floor (34 seconds to climb up 7 floors and 34 seconds to come down 9 floors). How much time does it take for the elevator to reach floor number 80, when it starts from the first floor, where the secret lab is located?

(Answer in terms of seconds)

(Integer Type)

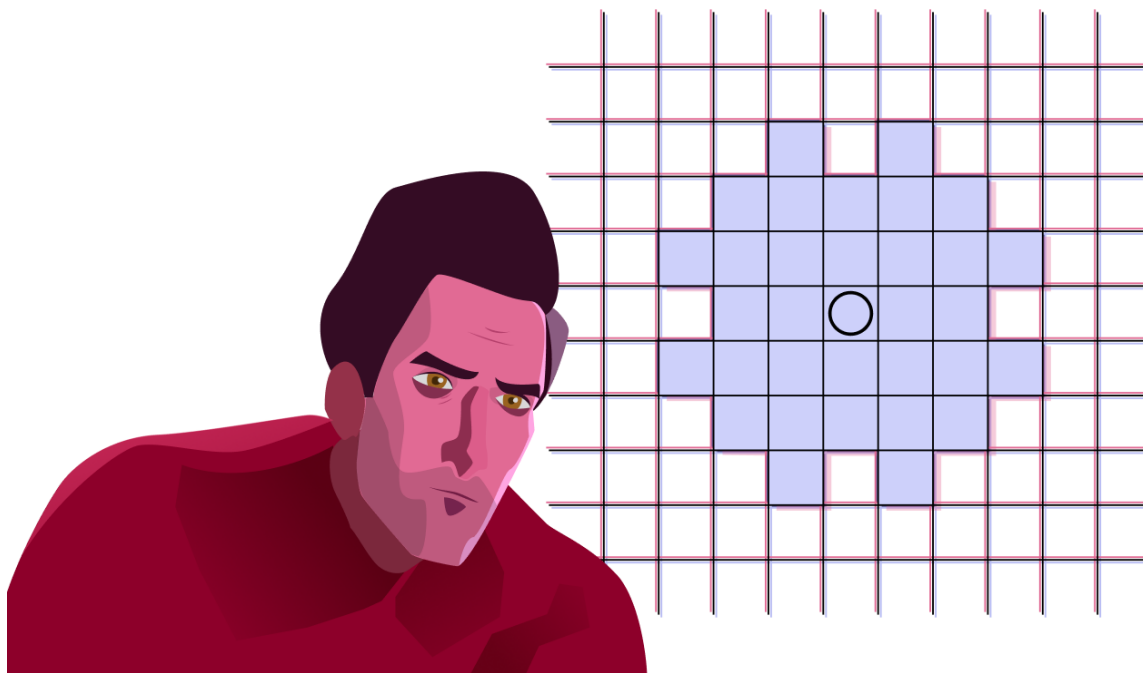
Answer.....

Question 17.

Miles and Peter manage to sneak into the lab and find the room with the computer. Miles starts freaking out again as he can't unstick himself from the ceiling, just as Kingpin and his scientist are outside. Miles then also finds out he can turn invisible while he's scared. The scientist then enters the room, forcing Peter to try and charm her. She is impressed to find Spider-Man alive, first she goes on to talk about her research

There is an infinite grid of squares. In one of the squares, there lives a cell (Biological unit of life) (marked as a circle in the following pictures). Cells cannot move, but they can perform their unique action: a cell can split itself into two daughter cells, which are identical to the original one, and each will occupy a square that is (orthogonally) adjacent to the original square. Since every square can only accommodate only one cell, a splitting can only happen when the cell has at least two empty adjacent squares (if there are more than two, then it can choose freely which squares to split). Also, two cells should not split simultaneously, so that no conflict should occur. On the grid, there is a region called "the prison" (painted gray in the following pictures). The aim is to let the cells escape the prison, i.e. to reach a status that no cell is in the prison.

How many minimum number of daughter cells will be there at the end when all the cells are free from prison.



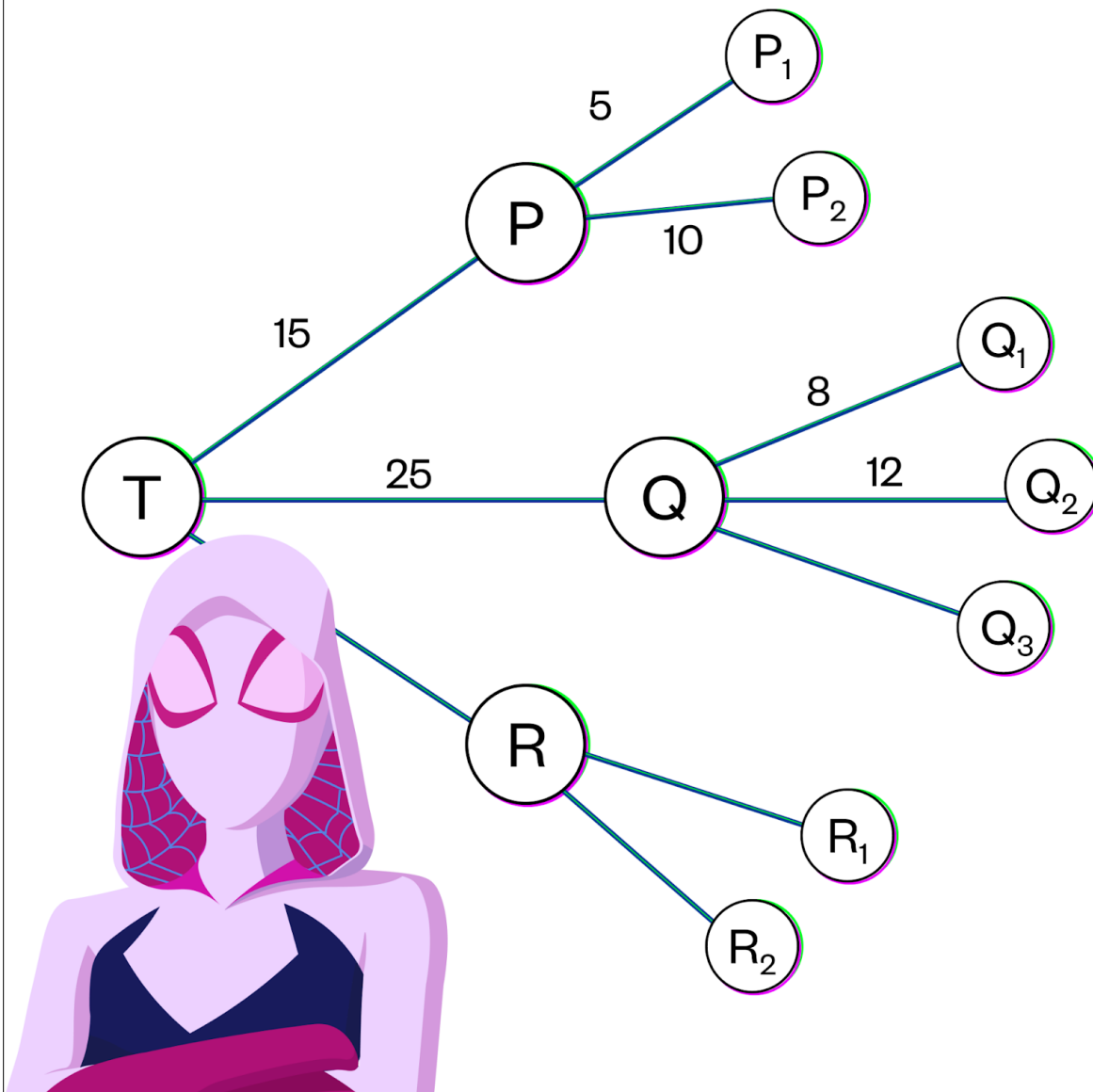
- a. 56
- b. 42
- c. 48
- d. 58

Question 18.

Peter listens to her carefully but later she reveals that it was just a distraction put by her only so she can kill him herself. She then reveals her name to be Dr. Olivia Octavius, aka DOC OCK. She reveals her mechanical tentacles as she attacks Peter, but Miles grabs the computer so that they can go. They are chased by scientists out of the lab and into the woods. The guys swing through the trees as the villains catch up, but Doc Ock gets webbed up by a third spider-person...GWEN. She tells Miles and Peter how she too has come from another dimension where she was bitten by a spider. There, she saved her father's life but couldn't save Peter. The three of them then head out of the woods to get away. Doc Ock later goes back to Kingpin, who is highly displeased to find there are two more Spider-Men around.

Peter suggests they visit Aunt May's home to get a hold of the situation. Gwen meanwhile asks for help in exchange for saving them before. Peter and Miles agree and ask what she wants.

Gwen explains that the central laboratory of the country produces 5000 liters of Liquid nitrogen every day. Liquid nitrogen is supplied to small-scale laboratories through a pipe system that is spread all across the country. Laboratory loses 40% of the produced liquid nitrogen due to its evaporation and supplies the rest of it to a tank 'T' which provides an equal volume of liquid nitrogen to the pipelines connecting the sub-stations P, Q & R. Similarly, sub-stations Q & R supply equal volume of Liquid nitrogen to the pipelines connecting them to their respective mini-stations. Sub-station P supplies liquid nitrogen such that an equal volume of it is received at mini-stations P_1 & P_2 . The numbers in the image indicate the length of the pipelines in km. It is observed that there is a loss of ' x '% and ' $2x$ '% of liquid nitrogen in the pipelines joining the tank to the substation and the pipelines joining the sub-stations to mini-stations respectively. (where ' x ' represents the length of the pipeline). Due to the scarcity of liquid nitrogen at sub-station Q, a new pipeline is fitted between sub-station R and sub-station Q. A liquid nitrogen loss of $5x$ % is observed in the new pipeline where ' x ' is the length of the pipeline (in km). Sub-station Q now supplies 300 liters of liquid nitrogen in each pipeline to its mini-stations. Find the length of the new pipeline if R supplies an equal volume of liquid nitrogen to each pipeline.



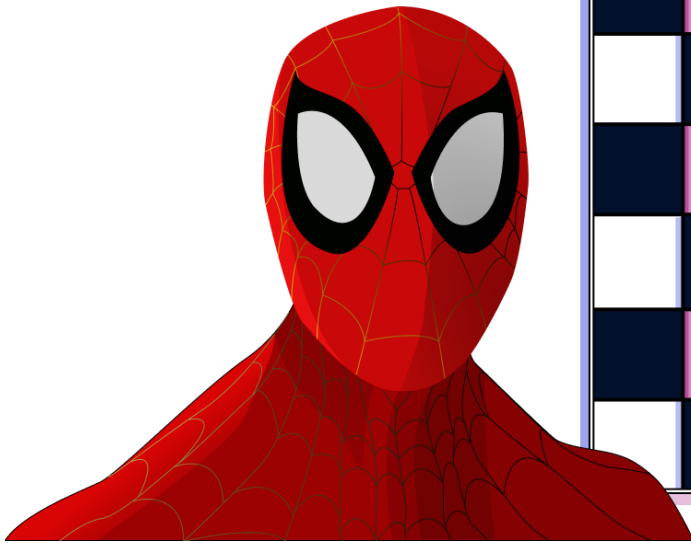
- a. 8.00 km
- b. 8.50 km
- c. 8.65 km
- d. 8.75 km

Question 19.

Gwen adds that they help in the addition of the new pipeline since a friend of hers works there. They are asked to complete the task and reach Miles's home where they take rest for a while. After some time Peter gets up and calls Miles for a fun game in the meanwhile,

Peter shows Miles a 6 * 6 chessboard. He explains that In one move you can make only a single cut on the board to form a right-angle triangle. The cut must **start and end** on a grid point and can only be made **if a right-angle triangle is formed**. He then goes on to ask how many maximum numbers of moves you can make or how many maximum numbers of right angle triangles can you get from the board?

Hint given by Peter: Grid points are the points where 2 lines intersect. **(Integer type)**

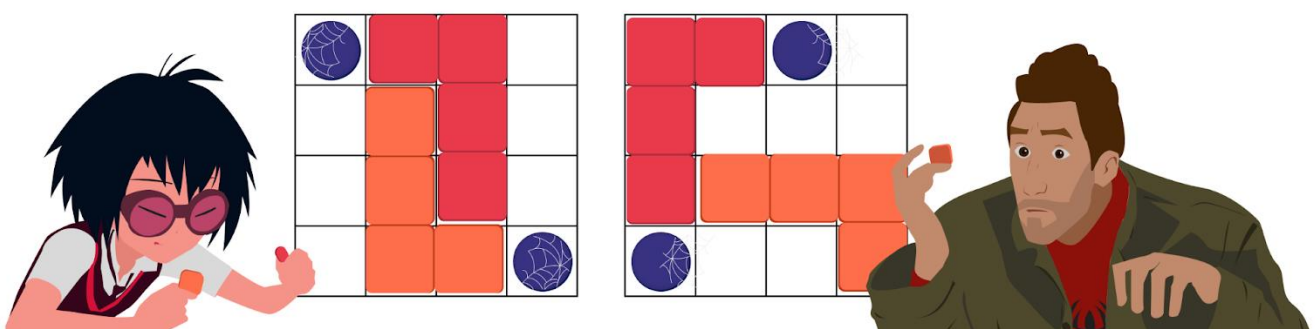


Answer.....

Question 20.

After the game Miles, Peter, and Gwen to go Aunt May's home, where she is able to figure out that the Peter she sees before she is from another dimension. She takes them to her Peter's old secret hideout, which is full of different suits, gadgets, and vehicles. There, the three meet Spider-Man Noir, a black-and-white old-gangster-talking hero; Peni Parker and her robot SP//dr, which is powered by a radioactive spider; and Peter Porker, aka Spider-Ham, who was actually a spider bitten by a radioactive pig. All of them were pulled from their own dimensions and into Miles's world. They each plan to stay behind and shut down the Collider with a new goober so that the rest can get home, but Miles says it has to be him since this is his dimension. When Peter tries to back him up by stating the cool powers that Miles has, he is unable to turn them on and prove to the others that he is capable of helping. Miles turns invisible and he dejectedly leaves the cave.

Miles goes to Aaron's home for help, just as Jefferson and Rio are contacting Aaron since they haven't heard from Miles in a while. Miles finds Aaron's apartment empty, but then encounters Prowler inside, prompting him to go invisible again. Prowler speaks to Kingpin and removes his mask, revealing himself to be Aaron. Miles is horrified. He tries to get out of the apartment but is chased by Aaron throughout the city until he manages to evade him.



Meanwhile back at Aunt May's house Peter and Peni are seen playing a game. In this game, there are 2 L-shaped pieces covering a total of exactly 4 squares each and there are 2 round neutral pieces as shown. The objective of the game is to prevent the opponent from making a move. A move consists of moving the L-shaped piece to a different orientation from what it is at that moment and then placing any one of the neutral pieces to a different position such that the opponent cannot make a move.

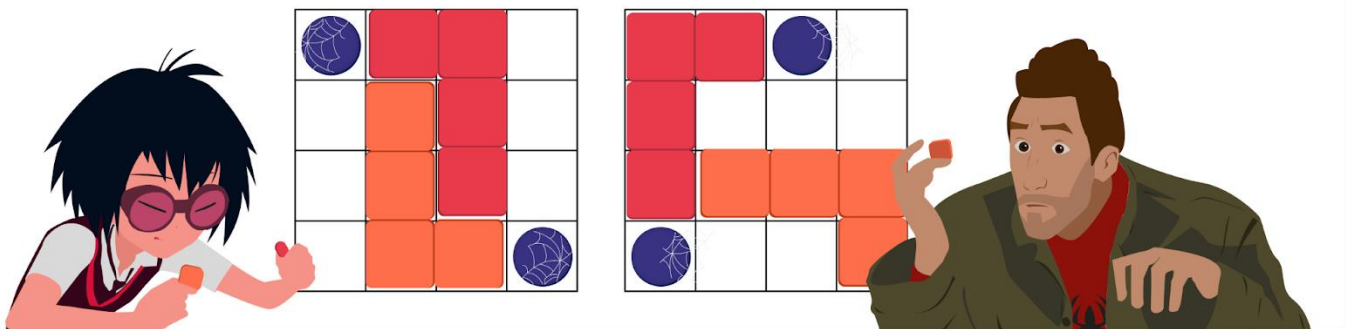
If both players Peter and Peni play optimally then who will be the winner? Peter Parker or Peni Parker ?

- a. Player to make the first move wins
- b. Player to make the second move wins
- c. Peter always wins irrespective of who starts the game
- d. No one will win and game will continue forever

Question 21

Bonus (only applicable if the previous question is correctly answered)

How many different numbers of moves can you make in the given situation if it is your turn and you are orange?



- a. 160
- b. 65
- c. 195
- d. 114

Section 5

Question 22.

Their game is however interrupted by Miles who tells them that his uncle is working for Kingpin. Unfortunately, Miles has led Prowler there, along with Doc Ock, Goblin, Tombstone, and Scorpion. The villains attack, and the Spider-People spring into action. Prowler goes after Miles and chases him to the rooftop. Kingpin orders Prowler to finish Miles off until Miles takes off his mask to reveal himself to his uncle. Aaron is mortified that he almost killed his nephew. As he backs down, Kingpin shoots Aaron in the back and then goes for Miles, but he swings out of there with his uncle. He takes Aaron to an alley where he is dying. Miles blames himself for what happened, but Aaron encourages him to keep pushing forward. Jefferson finds Miles over Aaron's body, sending Miles fleeing. Jeff then sees his brother and breaks down.

The heroes regroup with a devastated Miles. Peter webs Miles up to his chair and takes the goober to go stop the Collider, telling Miles it's for his safety. Peter chooses to sacrifice himself by staying behind and deactivating the collider. After they leave, Jefferson arrives outside Miles' door and expresses his faith in Miles, inspiring him. Miles manages to control his powers and creates his own Spider-Man suit. Meanwhile, the other Spider-People find Kingpin's Gala and sneak through the back entrance of the building. To enter the lift again they would be required to solve the following riddle:

A word is said to be of constant step size if the distance between each of its letters is the same. For example, ACEGIKM --- step size = 2

Note that the alphabets follow a circular pattern i.e there is 1 step from Z to A.

Two or more sequence or words are said to be "interwined" if there adjacent elements are separated by exactly one letter of each of other sequence. For Example, AQBRCSDT which contains 2 words ABCD and QRST each of step size 1.

They are given a 12 letter word containing 2 or 3 words of same/different steps sizes which are interwined together. They have to determine the next 12 characters of the given word if it is continued following the same pattern.

The given word is "XXYHZRABBLCV".

- a. DEFPGZJHITD
- b. FDPEFGZJHTDI
- c. FEDFZPJHGTDI
- d. DFEPFZGJHTID

Question 23.

They solve the riddle right in the nick of time to avoid the guards catching them. The elevator then leads them to the Collider room but Kingpin's henchmen find them and proceed to attack. Miles swings in and joins his comrades as they fight back. To make things worse, the Collider is activated, causing another earthquake across the city as dimensions start warping together.

Spider-Man Noir takes on Tombstone while Peni fights Goblin, and Spider-Ham beats up Scorpion with a cartoon mallet. Doc Ock goes after Gwen and Peter while Miles tries to shut the Collider down. In between the brawl, Peter, Peni, and Gwen are captured by Kingpin who throws them into a field in his nature laboratory is divided in three parts with trees, faced in such a way that Peter can see his and Peni's trees, Peni can see hers and Gwen's trees, and Gwen can see hers and Peter's trees. The number of trees in Peter's part is 6, that of Peni's part is 10, and that of Gwen's part is 8. Now, Kingpin plays a sick game. He asks Peter, Peni and Gwen, in that order, one per minute, the total number of trees in the field, and gives them options, 24 and 26. If even one of them answers correctly, they all are free, but if they answer wrong, all of them would be executed. They can choose not to answer. Find the minimum number of minutes that would take to answer correctly, assuming they all are very smart and apply perfect logic.

- a. 10
- b. 11
- c. 12
- d. 13

Question 24

The Spider-People, intelligent as they are, use their wits and answer his question correctly which angers Kingpin who proceeds to kill them anyway. Miles interrupts this and saves his 3 friends and they all escape to where the collider is located.

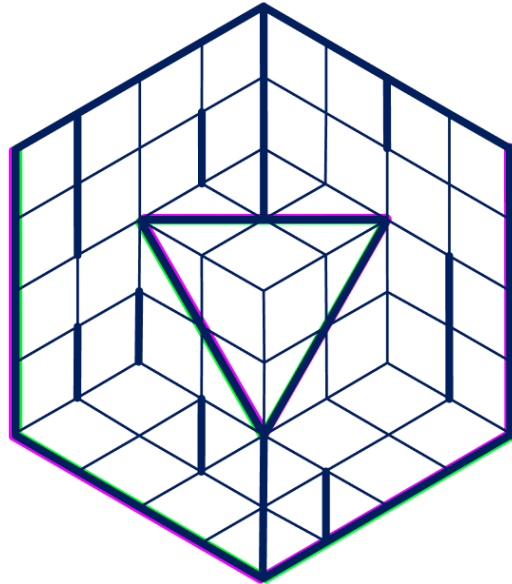
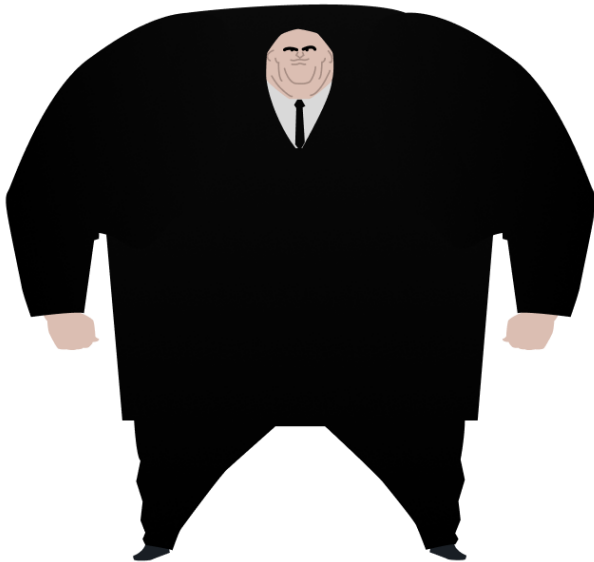
The main room where the collider is located is a square room whose walls are made up of mirrors. There is a laser situated at any **given random position**. Miles must go into it and pluck in the goober so that his friends can all get home. He is essentially a target placed in the room and **at a random position** and the laser is turned on. How many blockers (the same size as that of Miles) are required to be placed in the room so that the laser does not hit Miles from any of the infinite paths and he can successfully reach the center of the collider? (Note: The blockers cannot move but are fixed at their place) **(Integer Type)**

Answer.....

Question 25

They find out exactly where to place the blockers and this helps Miles to get inside and do his final task but he is met with a problem. To close the collider with the goober, Kingpin designed a program for it to authenticate twice. Now using all his intelligence, Miles essentially has to shade some cells of the following grid. Shaded cells cannot be orthogonally adjacent; unshaded cells must be orthogonally connected. When the puzzle is solved, he must not be able to draw a line segment that passes through two borders and does not pass through any shaded cells or grid vertices.

How many cells can Miles shade following the above rules? **(Integer Type)**



Answer.....

Section 6

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Question 26

Miles after all this time is left alone. But by the lessons he learned throughout the journey he had with his newly made friends, he acts as a hero and solves the puzzle on time and gets access to the collider, he proceeds to open portals to the universes of their friends and By then the other Spider-People show up and they say their farewells. Peni goes first, followed by Noir and Spider-Ham. Gwen affirms her friendship with Miles before going home. Peter tried to stay back and help Peter, but Miles chooses to send Peter back so that he can fix what he has to do in his world. Miles then goes after the Collider, but Kingpin starts hitting back hard. He then starts to see a new Vanessa and Richard as their dimensions start crossing over. Just as Kingpin seems to overpower Miles, he sees Jefferson as he enters the area. Miles gets himself up and uses his power to blast Kingpin away and then sends him webbed up toward the button to shut down the Collider for good.

Outside, Miles calls Jeff to let him know he's okay. He then approaches him as Spider-Man and hugs him, letting him know he's doing a good job, but not letting his dad know who he really is. Jeff then finds Kingpin webbed up and prepped for arrest. Miles now assumes his regular school duties while also taking on his role as the new Spider-Man, earning a number of new fans across the city. Meanwhile, in Peter's dimension, he heads off to patch things up with MJ.

Miles embraces the responsibilities of his new life. As Miles settles in his room for a nap, a dimensional portal opens and he hears a familiar voice calling to him. He hops inside the portal where he finds Gwen. She explains him about their new task and both of them head towards their next destination, IIT Guwahati, where many exciting adventures await them during the MAINS ROUND.

On a scale of 1 to 10 how much did you enjoy Po's adventure and how excited are you to continue the adventure at IIT Guwahati at the Mains event?

(10 -> Extremely Enjoyed, 1 -> Did not enjoy at all) **(Integer Type)**

Answer.....