



METIOX

Total Questions: 35
Maximum Marks: 140
Marking Scheme: +4,-1
Duration: 120mins

METIOX

Q1. Ash Ketchum is a young boy from Pallet Town. He is excited to get the right to train Pokemon. He hurries to Professor Oak’s house, the town’s foremost authority on researching Pokemon. Before giving Ash his first Pokemon, the Professor asks him a riddle to see if he deserves to get his right. Ash needs to find the next term in the series. The series is as follows:

C2E, D5F, H8G, Q11H, G14I, ?

- A) K17J
- C) F17J
- B) M16J
- D) P18J

Q2 Ash correctly answers the riddle. Professor Oak is elated and asks Ash to choose a pokemon. There is a mirror present in a room and a word is visible in the mirror. To choose a Pokemon, he has to guess which word is written. He correctly guesses the word “GAMBITOR” and wins Pikachu. What was the mirror image visible to him? *(Mirror was kept to the right of the text.)*

- A) ROTIBMAƆ
- C) ƆAƆMBILOƆ
- D) NONE
- B) ROTIBMAƆ

Q3. Ash moves on to Viridian City with Pikachu. On the way, he is attacked by a group of angry Spearows. Hence, he desperately steals a bike. The turns in the road ahead are labeled as letters from A to Z, Only alternate turns are accessible and the rest are blocked with turn B being the first accessible one. He calculates that if he could take the central turn of the series of turns, he would escape the Spearow. Which lettered turn should Ash reach to get to the middle?

- A) M
- C) O
- B) N
- D) M or O

Q4. Having finally escaped the Spearow after wrecking the bike, Ash is confronted by Misty, whose bike he stole. She declares that she will not leave Ash’s side until she is properly compensated. Her family is found to be standing beside her. The following is known about her family:

1. There is a group of six persons A, B, C, D, E and F from a family. They are Professor, Manager, Lawyer, Jeweller, Doctor and Engineer by profession.
2. The Doctor is the grandfather of F who is a Professor.
3. The Manager D is married to A.
4. C, the Jeweller is married to the Lawyer.
5. B is the mother of F and E.
6. There are two married couples in the family.

What is the profession of E?

- A) Doctor
- C) Manager
- B) Jeweller
- D) None of these

Q5. Having finally escaped the Spearow after wrecking the bike, Ash is confronted by Misty, whose bike he stole. She declares that she will not leave Ash’s side until she is properly compensated. Her family is found to be standing beside her. The following is known about her family:

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3. The Manager D is married to A.
4. C, the Jeweller is married to the Lawyer.
5. B is the mother of F and E.
6. There are two married couples in the family.

How is A related to E?

- A) Brother

B) Uncle
- C) Father

D) Grandfather

Q6. Having finally escaped the Spearow after wrecking the bike, Ash is confronted by Misty, whose bike he stole. She declares that she will not leave Ash’s side until she is properly compensated. Her family is found to be standing beside her. The following is known about her family:

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2. The Doctor is the grandfather of F who is a Professor.
3. The Manager D is married to A.
4. C, the Jeweller is married to the Lawyer.
5. B is the mother of F and E.
6. There are two married couples in the family.

What is the profession of A?

- A) Doctor

B) Lawyer
- C) Jeweller

D) Manager

Q7. To compete in the Pokemon League tournament, Ash must defeat Gym Leaders and earn badges as evidence of his victories. He and Misty move towards Pewter City to battle with the first Gym Leader. To their dismay, the route is obstructed and will take some time to clear up. Growing impatient, he decided to calculate the amount of time it would take to clear the blockade.

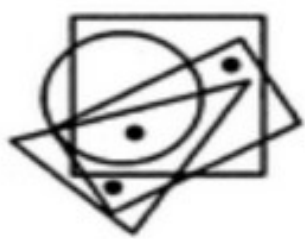
Two Geodude A and B were working to clear the blockade. A is twice as good a workman as B and therefore is able to finish a job in 80 hours less than B. Working together, they can do it in X hours, but after working for some hours A left the job. The job got completed in Y hours total. Find the approximate no. of hours A worked if the job gets completed 20 hours after he left.

- A) 43

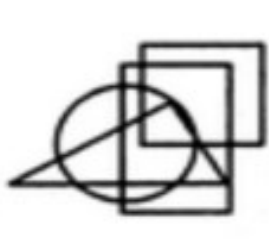
B) 44
- C) 49

D) 47

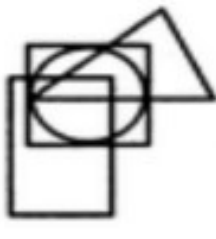
Q8. After waiting for several hours, they again set on their way and reached the Gym Leader’s house. To enter the Gym, Ash has to solve a puzzle. Only by solving the puzzle will the door to the Gym open. Select the figure that can satisfy exactly the same conditions of the dots as in the given figure (X):



(X)



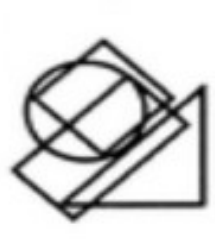
(1)



(2)



(3)

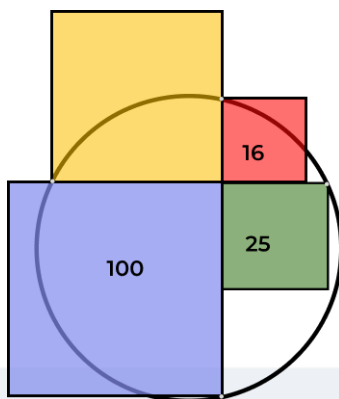


(4)

- A) 1
C) 3

- B) 2
D) 4

Q9. Ash correctly solves the puzzle and proceeds to walk inside the Gym. He is met with Brock, the Gym leader. He is busy at the moment and thus Ash and Misty wait in the Gym. Misty, pesterer as she is, tells Ash “I am pretty sure you are so stupid that you will not even be able to guess the area of the gym where we are currently sitting” and laughs away. Ash is angered and decides to teach her a lesson. Help Ash calculate the area of the circular Gym. *(Rounded off to the nearest integer)*



- A) 167
C) 148

- B) 150
D) 161

Q10. After waiting for a while, Brock appears. He is astonished to find such a young boy so eager to beat him. Ash chooses Pikachu against Brock’s Onix. After a hard fight, Pikachu is almost defeated. Ash is heartbroken. Suddenly, he thinks of an idea. If he could trap Onix into one of his tricks, he could win. He decided to lure Onix into one part of a trapezium on the battlefield. But for this, he needed to know the side length of the trapezium. Help Ash determine the side length x . [Given that Area-2 is 6 more than Area-1 and the trapezium is right angled] *Round off your answer to the nearest whole number.*



- A) 5
C) 9

- B) 6
D) 8

Q11. Ash wins his first battle. Brock is impressed and decides to venture with Ash in his journey to win the Pokemon League. Before leaving the Gym, Brock has to take care of all the trades done by him in the past few days. While looking into all his transactions, he had an unusual thought. He purchased 15 kg of variety “A” rice at Rs. X per kg and 10 kg of variety “B” rice at Rs. $(X+5)$ per kg. He sold the whole quantity of variety “A” rice at 10% profit and that of variety “B” rice at 20% profit. The total selling price of variety “A” rice was Rs. 30 more than that of variety “B” rice. Had the two varieties been mixed and sold at an overall profit of 20%, what would have been the selling price of the mixture(per kg)?

- A) 5 Rs. 23.20

B) Rs. 24.20
- C) Rs. 25.00

D) Rs. 26.40

Q12. Before the trio set off, Ash had a genuine question in his mind-how many Gym Leaders are present in the region? He sought the answer from Brock. Brock told him that the number of Gym Leaders present in the region are equal to the value of the 1000th number of the series

1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 0, 1, 1, 1, 2, 1, 3, 1, 4, 1, 5,

The number of Gym Leaders present are:

- A) 3

B) 4
- C) 9

D) 7

Q13. Together with Brock and Misty, Ash travels across the Kanto region, defeating Gym Leaders. After collecting all badges, he is asked by the final Gym Leader a riddle to participate in the Indigo League:

You have 15 Rs with you. You go to a shop and the shopkeeper tells you the price as Rs 1 per Pokeball. The pokeballs come in a box. He also tells you that you can also get a pokeball in return for 3 empty boxes. How many maximum pokeballs can you get?

Answer – 22

Q14. Ash reaches the top 16 in the Indigo League. His opponent Richie uses Bulbasaur while Ash uses Pikachu. The League provided an opportunity to both of them to evolve one of their Pokemon and gain an upper hand in battle if they could answer one question:

A Lady (L) bought an item of Rs 100 from the Shopkeeper (C). She paid him through a 500 Rs note. Realizing that he did not have change, the shopkeeper C got change for that note from another shopkeeper (S) and paid Rs 400 to the lady. After a few days, S realized that the note was fake, and thus railed at C and took Rs 500 back from him. So in this whole process how much money did C lose in the process?

Answer – 500

Q15. Richie correctly answers the question well before Ash and evolves his Bulbasaur to Ivysaur. No matter how hard Ash’s Pikachu tried, the opponent Ivysaur always countered his attacks, resulting in Ash’s loss in the match and his first major defeat. Ash’s downcast was not hidden on losing to the riddle, so Brock asked him a simple riddle to lift his spirits up:

A League consists of 5 matches with Gym Leaders - Korrina, Sabrina, Blue, Volkner and Brock. 60% Pokemon trainers lost to Korrina, 80% lost to Sabrina, 72% lost to Blue and 95% lost to Volkner. What percentage of trainers lost to Brock such that the least number of trainers lost to all Leaders is 3%?

- A) 97

B) 3
- C) 7

D) 96

Q16. Rejuvenated on answering this, Ash is pretty confident that he will go on to win the Pokemon League one day and decides to train very hard for the same. Upon Ash’s return to Pallet Town, Professor Oak asks him to go to Professor Ivy in the Orange Islands to collect a GS Ball, a mysterious Pokeball that cannot be opened. Upon his meet with Professor Ivy, she asks him a question to see if he is capable enough to win the GS Ball:

The selling price of a Pokeball is initially 70% above the manufacturing cost. The retailer always earns 19% profit on his purchase price.If the retailer gives a 15% discount after increasing the initial selling price by 10%. Find the profit percentage of the manufacturer.

- A) 33.57%.

B) 41.50%
- C) 37.55%

D) 29.51%

Q17. Ash receives the GS ball and is surprised to find out that it isn't a ball but a cube whose each corner is truncated(cut) symmetrically such that each face is again converted into a square of smaller size. The original side of the cube was 8. Ash wonders what is the total surface area of the final truncated 3D shape formed. The total surface area turned out to be "A+ B√C" where C is the smallest possible number. find out the value of A+B+C. Answer – 259

Q18. Ash couldn't wait to get back to Professor Oak and tell him of his achievement. On the way back, he had to cross a park which was in the shape of an isosceles triangle PQR with equal sides PQ and PR of length 500m. There is a tower in the midpoint of side QR. If the angle of elevation of the top of the tower from P and Q is 60° and 30° respectively, and Ash has to walk alongside QR, find the total distance that needs to be traveled to cross the park.

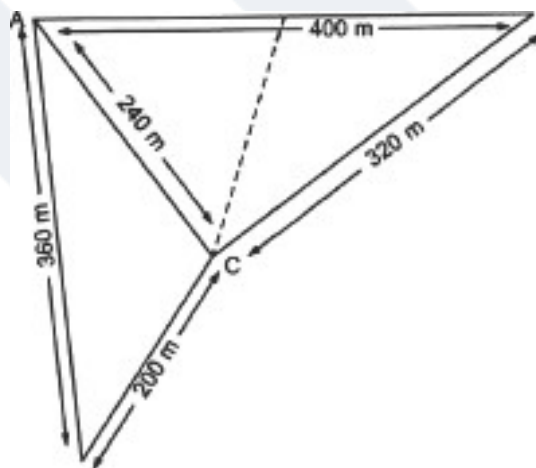
- $\frac{250\sqrt{3}}{300\sqrt{10}}$ A) $\frac{500}{100\sqrt{10}}$ B)
 $\frac{250\sqrt{3}}{300\sqrt{10}}$ C) $\frac{500}{100\sqrt{10}}$ D)

Q19. On reaching Pallet Town, they were met with two pillars alongside each other. Curious Misty again dropped a question to Ash:

The elevation of the top of the smaller tower from the bottom of the bigger is 45°. Due to storm, the bigger pillar falls and the top of it touches the midpoint of the smaller pillar. It was found out that if the pillar fell in the opposite direction, then the distance of its top from the bottom of the smaller tower would have been 60 metres. The heights of the smaller and bigger towers are respectively :

- A) $\frac{60}{2 + \sqrt{5}}, \frac{30\sqrt{5}}{2 + \sqrt{5}}$ B) $\frac{60}{2 + \sqrt{5}}, \frac{30\sqrt{5}}{2 + \sqrt{5}}$
 C $\frac{80}{9}, \frac{240}{9}$ D) $120(\sqrt{5} - 2), 60(5 - 2\sqrt{5})$

Q20. Ash met a Pokemon trainer on his way. After some inquiry, he got to know that the trainer has a field where he keeps his pokemons. The farmer has a triangular field with sides 240m, 200m and 360m, where he kept electric type pokemons. In another triangular field with sides 240m, 320m and 400m adjacent to the previous field, he wanted to keep grass and fire type pokemons (see figure). He divided the field into two parts by joining the midpoint of the longest side to the opposite vertex and kept grass type pokemons in one part and fire type in the other part. How much area (in hectares) has been used for electric, grass and fire type pokemons? (10000 m² = 1 hectare)



- A) $1.6\sqrt{2}, 1.92, 1.82$ B) $3.2, 1.72, 1.72$
 C) $1.6, 1.78, 1.72$ D) $1.6\sqrt{2}, 1.92, 1.92$

Q21. After meeting with Professor Oak, the trio travels to Johto region. The region is guarded by a Mewtwo, who poses a mathematical question to the group to enter:

Let x_1 and x_2 satisfy the equation $x^2 - 6x - 2 = 0$ $x_1 > x_2$ ($x_1, x_2 \in \mathbb{R}$). Also $a_n = x_1^n - x_2^n$, $n \geq 0$.

$$\underline{a_{10} - 2a_8}$$

Calculate a_9 . [where x_1 and x_2 satisfy this equation $ax^2+bx+c=0$].

Answer - 6

Q22. Ash enters the Johto region and proceeds to defeat the Gym Leaders one by one. The last Leader was astonished at his performance and asked him a hard question to break his confidence:

The value of $x^2 + y^2 + 13xy - x^2 - y^2 - 85$ if $x + y = 5$ is :

- A) 3
C) 100
- B) 25
D) 15

Q23. Having correctly answered the question, Ash was confident and competed in the Johto League. Ash defeats Gary, wherein he is asked another question:

Find the sum of all possible values of prime number p if $x^2 + px - 78p = 0$ has integral roots. [Hint:

Equation $ax^2 + bx + c = 0$ has roots $\frac{-b + \sqrt{b^2 - 4ac}}{2a}$ and $\frac{-b - \sqrt{b^2 - 4ac}}{2a}$ and

ANSWER- 13

Q24. After advancing to the quarter-finals, Ash has a match with Harrison. He says to Ash, “I am going to ask you a question. According to a prophecy, if you could answer the question, you will be able to win the match. But if you can’t, then you are destined to lose.”

“Let f be a polynomial taking input values in natural numbers and giving output as rational numbers. f shows the given property: for all $n > 1$

Find the value of $f(729)$ rounding it off to the nearest integer. Given that $\int_0^1 f(x) dx = 4096$.

ANSWER- 3

Q25. Ash couldn't answer the question and the prophecy turned out to be true once again. Harrison informs Ash of the Hoenn region and provides a map of the region. The map was in an irregular shape as shown in the figure, so Ash decided to fold it. Which of the options would be the result of folding the given map?





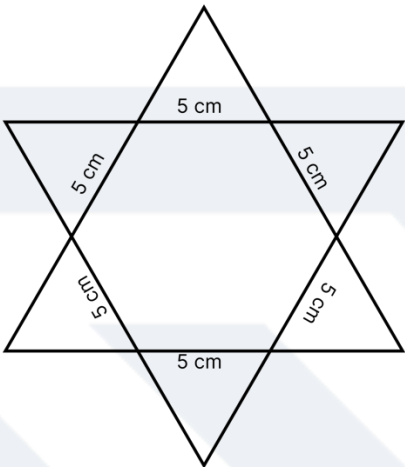
Q26. As Ash goes back to Pallet Town, Brock’s family asks him to return back to Pewter City. Misty receives a message from her sisters which were enclosed inside a cube. The cube asked for a password for it to be opened. The password of the cube was the minimum distance a Nymble has to travel starting from one vertex of the cube and reaching the midpoint of the edge in contact with the vertex opposite to the starting vertex. The edge length of the cube is 1. Misty gives up after trying to solve the puzzle, and she asks for Ash’s help.

The password of the cube is $\sqrt{(a/b)}$ where a and b are prime, find “a+b”

ANSWER- 15

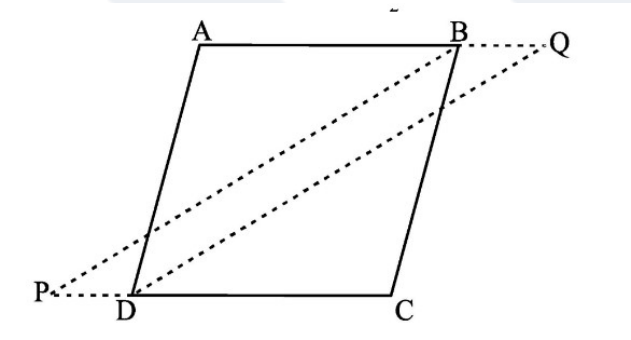
Q27. Ash guesses the correct password, and the cube reveals a letter telling Misty that her sisters are leaving on a world tour and have entrusted the Cerulean Gym to her. So Ash travels to Hoenn alone and participates in the Hoenn League after defeating all eight Gym Leaders. The battle had the names of all Pokemon Masters competing in the League.

The chart showing the names of all Masters was in the shape of a star as shown below, and the names of Pokemon Masters were written inside triangles of sides 1 cm. How many Pokemon Masters were competing in the League?



Answer - 300

Q28. Beside the chart was a map of the battlefield where all battles were going to take place. The map was as shown:



Bisectors of $\angle B$ and $\angle D$ of ABCD meets CD and AB produced at P and Q respectively. Then which of the following is correct:

A) $\angle PDQ + \angle DQB = \angle P + \angle Q$

B) $\angle ADQ + \angle PBC = \angle P + \angle Q$

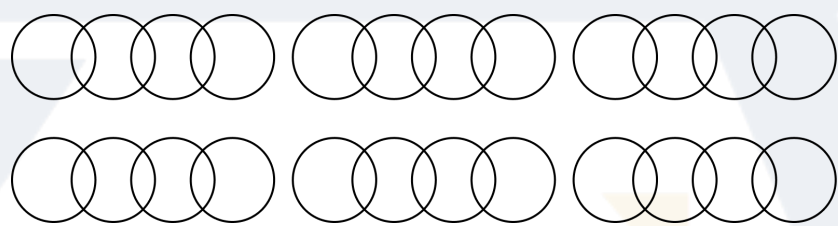
- C) $\angle DAB + \angle ADQ = \angle P + \angle Q$
- D) $\angle DCB + \angle PBC = \angle P + \angle Q$

Q29. After analyzing the map, Ash met with a Pokemon Coordinator May and her younger brother Max. Max had a bundle of sheets with him and was demanding his sister to let him take the bundle with him as he wanted to wrap a gift box with it. His sister repeatedly told him not to carry it home as they wouldn't require so many sheets, but to no avail. Ash thought to help them in deciding the number of sheets required. The gift box had a length, breadth and height as 80cm, 40cm and 20cm respectively. The square sheets had a side of 40cm. How many sheets would be required?

Answer – 7

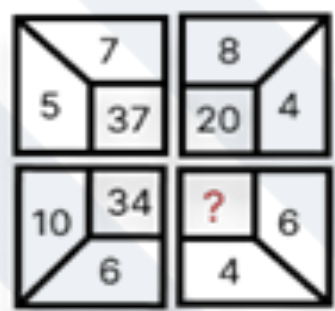
Q30. May and Max were elated and became friends with Ash. Ash was happy that finally he wouldn't need to travel alone. Suddenly, little Max popped up with a riddle for Ash:

Suppose Ash has 6 chains having 4 interconnected rings each. He can open one ring in 1 Rupee and join in 4 Rupees. What least cost does he have to pay to join all rings in one straight chain?



Answer - 20

Q31. One by one, the participants were taken inside the Battleground by entering a password. Ash's turn came. He spent quite some time but finally reached the answer and was inside the battlefield.



What was the password for the Battlefield?

- A) 30
- B) 26
- C) 25
- D) 32

Q32. Ash found out that only twenty people could enter the battlefield. He noticed that in any group of four people, there is at least one person who knows the other three (we assume that if X knows Y, then Y knows X). Suppose there are three people who do not know each other. What is the minimum number of people who know everyone?

- A) 16
- B) 17
- C) 18
- D) Cannot be determined from the given data

Q33. Ash defeated Pokemon Trainers one by one and reached the top 8. He faced a brutal Master who excelled in water type Pokemons, and the match required both competitors to use water Pokemons. This made Ash really anxious. The tank where the battle was going to be held was in the shape of a hemisphere and it was filled with a flow rate of 500 litres per minute. Water from the tank also flowed to a nearby lake at a rate of 2 litres per minute. At an instant there was 1000 kilolitres of

water in the tank. Find the amount of water pumped until the tank was just full. Radius of the tank was 14 metres. (Assume density of water to be 1.05 g/cm³)

A) 4766 kilolitre

B) 4747

C) 4984 kilolitre

D) 4996 kilolitre

Q34. Ash chose Squirtle while his opponent chose Starmie. Though Ash was hesitant at first, he gained confidence gradually and the battle proved to be a cakewalk for him. His opponent chose one pokemon after the other but Ash’s Squirtle was able to defeat all of them with ease. Ash was finally on the way to win the Hoenn League. The number of Pokemons chosen by his opponent were equal to the sum of digits of x, where x is the number of times 5 occurs while writing numbers from 1 to 1000. How many Pokemons did Ash’s Squirtle defeat?

A) 3

B) 10

C) 17

D) 5

Q35. Ash had a final match with Steven Stone, the former champion of the Hoenn region Pokemon League. After a very arduous combat, Ash won the match by using Pikachu, Bulbasaur and Charmander against Steven’s Beldum, Zygarde and Cradily. Pikachu’s vigor was immeasurable and this resulted in creating a deep friendship bond between Ash and Pikachu which will last for years to come. Steven was happy on seeing such a young Pokemon Trainer beat him, he could surely see him becoming a Pokemon Master and going on to win the Pokemon League. As humbly as possible, he asked Ash one final question before bidding goodbye:

Let the solutions of the below given equations be x_1, y_1

$$\sqrt{x} + y = 7$$

$$x + \sqrt{y} = 11$$

Find the value of $x_1 * y_1$

- A) -36

B) 32

C) 34

D) 36