

Markhor Junior Contest 2025

Aspirant Level (Class IX & X, O/A Level's)

Mathematics

Time Allowed 60 Minutes

There are 19 problems, graded as follows:

Questions 1-5 are 1 point each,

Questions 6-10 are 2 points each,

Questions 11-15 are 3 points each,

Questions 16-19 are 5 points each.

- 1. A machine prints the smallest 5-digit and largest 6-digit mirror numbers (same forward and backward). What is their difference?**
 - a) 989889
 - b) 989998
 - c) 990099
 - d) 999989
 - e) None of the above
- 2. Sana starts with 90 full juice bottles and keeps all empty ones. For every 5 empty bottles, she gets 1 full bottle from recycling. She repeats this process until no more bottles can be obtained. How many bottles will she sell in total?**
 - a) 90
 - b) 108
 - c) 111
 - d) 112
 - e) None of the above

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- 3. What percentage of the numbers from 1 to 1000 are perfect squares?**
- a) 3.0%
 - b) 3.1%
 - c) 4.1%
 - d) 5.0%
 - e) None of the above
- 4. I have an unusual set of cards numbered from 0 to 4, but the even numbers are replaced with fractions ($\frac{1}{2}$, $\frac{1}{4}$, 0 in place of 0, 2, 4). If I draw TWO such cards, which of these sums cannot be achieved?**
- a) 0.5
 - b) 0.75
 - c) 1
 - d) 1.75
 - e) None of the above
- 5. In the 2024 Markhor Junior Contest, there were 30 more boys than girls. In 2025, boys increased by 20%, girls by 90%, and total participants by 40%. What was the total number of participants in 2025?**
- a) 68
 - b) 98
 - c) 105
 - d) 150
 - e) None of the above

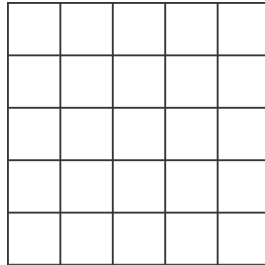
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6. A factory has 72 blue and 72 red marbles. Each box must have the same number of blue marbles, a different number of red marbles, and at least one of each color. What is the maximum number of boxes that can be made?
- a) 6
 - b) 8
 - c) 9
 - d) 12
 - e) None of the above
7. To form "MARKHOR" from "RORMKAH", how many minimum adjacent swaps are needed?
- a) 5
 - b) 7
 - c) 11
 - d) 13
 - e) None of the above
8. The digits from 1 to 100 are written without spaces and grouped into four-digit blocks (quads) 1234, 5678, 9101, 1121, ... Which of the following quads does not appear?
- a) 1323
 - b) 1828
 - c) 1222
 - d) 6869
 - e) None of the above

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- 9. Zayn is designing a pattern on a 5×5 grid. He wants to colour the cells so that each row, each column, and both main diagonals (from corner to corner) contain five different colours with no repeats. What is the minimum number of colours he needs to achieve this?**

- a) 5
- b) 9
- c) 18
- d) 25
- e) None of the above



- 10. A team of employees completed a group project. If each junior employee had contributed 4 hours more, then the average contribution per employee would have increased by 2 hours. What percentage of the team were senior employees?**

- a) 25%
- b) 40%
- c) 50%
- d) 60%
- e) None of the above

- 11. In 2025, a grandfather and his grandson found that the product of their ages was 2025. If the grandfather is 100 or younger, in which year was he born?**

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- a) 1948
- b) 1950
- c) 1952
- d) 1955
- e) None of the above

12. Saim writes the word MARKHOR repeatedly 100 times to create a long string of letters. From this string, he removes all letters at odd positions (1st, 3rd, 5th, etc.). He repeats the same process on the remaining string removing letters at odd positions again and again until only one letter remains. Which letter is the last one left?

- a) M
- b) A
- c) R
- d) K
- e) None of the above

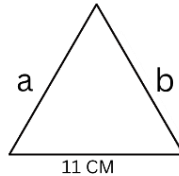
13. Zara, Nida, and Ayesha started a business. Ayesha invested \$2000. Nida invested one-third of what Zara and Ayesha invested together. Zara invested half of what Nida and Ayesha invested together. What was their total investment?

- a) \$4600
- b) \$4800
- c) \$5000
- d) \$5200
- e) None of the above

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14. The lengths of the sides of a triangle in centimeters are natural numbers: 11, a , and b . If the product of all the sides is 924, what is the maximum possible perimeter of the triangle?

- a) 29 cm
- b) 30 cm
- c) 31 cm
- d) 32 cm
- e) None of the above



15. The numbers from 1 to 100 are each written once on a whiteboard. Students play a game: in each move, they erase any two numbers and replace them with a new number equal to their sum plus 1. This process continues until only one number remains on the board. What is the final number left on the board?

- a) 5049
- b) 5050
- c) 5099
- d) 5149
- e) None of the above

16. In a dice challenge, each of the 1080 players rolls a 6-sided dice three times. A player wins if the third roll equals the sum of the first two and at least one roll is a 6. How many players are expected to win?

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- a) 20
- b) 23
- c) 25
- d) 27
- e) None of the above

17. Riya, Kabir, and Leena take turns drawing a marble numbered 1 to 6, with replacement. Riya wins on drawing 1 or 2, Kabir on 3 or 4, and Leena on 5 or 6. The turn order is Riya, then Kabir, then Leena, repeating until someone wins. What is the probability that Leena wins?

- a) $\frac{2}{11}$
- b) $\frac{4}{19}$
- c) $\frac{5}{36}$
- d) $\frac{7}{216}$
- e) None of the above

18. The square root is taken of the number 0.1111.... What is the 60th digit after the decimal point of the square root?

- a) 1
- b) 2
- c) 3
- d) 4
- e) None of the above

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19. On the mysterious Island of Tellers and Tricksters, every inhabitant is either a Teller, who always speaks the truth, or a Trickster, who always lies. During my visit, I met two men named Ravi and Karan. Curious to know what kind they were, I first asked Ravi whether both of them were Tellers. He gave an answer, but it left me uncertain about their true nature. Then I turned to Karan and asked him whether Ravi was a Teller. After hearing Karan's response, I immediately understood which of them spoke the truth and which one lied. What were Ravi and Karan?

- a) They were both Tellers.
- b) They were both Tricksters.
- c) Ravi was a Teller and Karan was a Trickster.
- d) Ravi was a Trickster and Karan was a Teller.
- e) Not enough information is given.