

Markhor Junior Contest 2025

Pioneer Level (Class VII & VIII) 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,

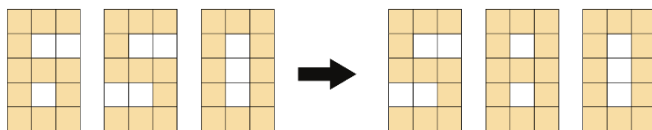
Questions 11-15 are 3 points each,

Questions 16-19 are 5 points each.

- 1. An LED board shows 650, then changes to 580.**

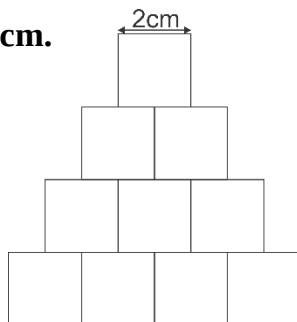
How many segments change their state (from on to off or off to on)

- a) 3
- b) 4
- c) 5
- d) 6
- e) None of the above



- 2. One side of small square is 2cm. find its parameter.**

- a) 16 cm
- b) 24 cm
- c) 32 cm
- d) 40 cm
- e) None of the above



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3. **Maya is picking gloves blindfolded. There are 6 black gloves (3 pairs) 4 grey gloves (2 pairs) 2 red gloves (1 pair), 4 gloves have holes, and she doesn't know which ones. She wants two good gloves of the same colour. What's the minimum number of gloves she must pick to be sure of getting that?**
- a) 6
 - b) 8
 - c) 10
 - d) 14
 - e) None of the above
4. **The Markhor Junior Contest takes place every year on the fourth Wednesday of September. What is the earliest possible calendar date on which the contest can be held?**
- a) 21st September
 - b) 22nd September
 - c) 25th September
 - d) 28th September.
 - e) None of the above
5. **A decorative garden path is made using alternate red and grey tiles, each 40 cm wide. The path starts and ends with a red tile and contains 10 red tiles in total. What is the total width of the path?**
- a) 7.2 m
 - b) 7.6 m
 - c) 8 m
 - d) 8.4 m
 - e) None of the above

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6. A storage barrel was filled up to one-fifth of its total capacity. After pouring in 30 more liters of liquid, the barrel reached three-tenths of its full capacity. What is the total capacity of the barrel?
- a) 100 liters
 - b) 150 liters
 - c) 200 liters
 - d) 300 liters
 - e) None of the above
7. At exactly 12:44, a curious student notices that the digits on the digital clock 1, 2, 4, 4 form an interesting pattern. She wonders: How many minutes later will the clock next display a time using exactly the same digits one 1, one 2, and two 4s in any order?
- a) 76 minutes
 - b) 84 minutes
 - c) 100 minutes
 - d) 112 minutes
 - e) None of the above
8. A square park has a side of 100 m. At each corner, there are flower beds in the form of quadrants of radius 14 m. What is the area of the remaining part of the park?
- a) 9370 m²
 - b) 9384 m²
 - c) 9400 m²
 - d) 9420 m²
 - e) None of the above

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- 9. Five players take part in a table tennis tournament. Each player plays exactly one match against every other player. In each match, the winner receives 3 points, the runner-up receives 0 points, and if the match is a draw, both players receive 1 point. Which of the following scores is not possible for a player to achieve by the end of the tournament?**
- a) 3
 - b) 5
 - c) 10
 - d) 11
 - e) None of the above
- 10. In a music academy, Ayaan attends drumming sessions three times per week, while Zoya attends the same sessions once every two weeks. By the end of the term, Ayaan has attended 45 more sessions than Zoya. If both started attending sessions in the same week and never missed any, how many weeks long was the term?**
- a) 12
 - b) 18
 - c) 24
 - d) 28
 - e) None of the above
- 11. Six astronauts are aboard a space station that has two oxygen recharge pods. Each astronaut must spend a specific amount of time in a pod to fully recharge before starting their daily tasks. Only one astronaut can use a pod at a**

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time, and they start recharging from 05:15 AM. The required recharge times for the astronauts are: 9, 11, 13, 16, 19, and 23 minutes respectively. Using the pods in the most efficient way, what is the earliest time all astronauts will be done recharging?

- a) 5:45 AM
- b) 5:46 AM
- c) 6:01 AM
- d) 6:00 AM
- e) None of the above

12. An engineer wants to determine the weight of a small metal bolt to within 0.1 gram of accuracy. However, the industrial scale available has a maximum error of ± 12 grams. To reduce the error per bolt, he decides to weigh multiple identical bolts together. What is the minimum number of bolts he must weigh at once to meet his accuracy requirement?

- a) 12
- b) 24
- c) 100
- d) 120
- e) None of the above

13. By selling a bag for \$480 instead of \$520, the loss percent increases by 4%. What is the cost price of the bag?

- a) \$900
- b) \$950
- c) \$1000
- d) \$1050
- e) None of the above

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- 14. Every student in a summer camp takes part in either painting, music, or both. Two-thirds of the students attend the painting workshop, and three-quarters attend the music workshop. If 30 students attend both workshops, how many students are there in the camp?**
- a) 60
 - b) 72
 - c) 84
 - d) 90
 - e) None of the above
- 15. Lina picks two different numbers from the set $\{1, 2, 3, \dots, 17\}$. She finds that the product of those two numbers is equal to the sum of the remaining 15 numbers in the set. What is the difference between these 2 numbers?**
- a) 3
 - b) 6
 - c) 13
 - d) 16
 - e) None of the above
- 16. A theme park claims that it remains open on 350 days in a year, closing only on a few days for maintenance or weather conditions. Leo wants to visit the park for a long vacation in 2026 and hopes to enjoy at least two consecutive open days. To guarantee this, regardless of which specific 15 days the park might be closed, what is the minimum number of consecutive days Leo must plan to stay near the park?**

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- a) 17
 - b) 21
 - c) 31
 - d) 32
 - e) None of the above
- 17. In a robotics contest with 160 judges, Team Alpha has 45 votes, Team Beta has 38, and Team Gamma has 51; how many more votes must Team Gamma receive to guarantee victory regardless of how the remaining votes are cast?**
- a) 9
 - b) 10
 - c) 11
 - d) 12
 - e) None of the above
- 18. When 20% of a number is added to another number, the second number increases by 50%. What is the ratio between the first and the second number?**
- a) 3:5
 - b) 5:3
 - c) 2:5
 - d) 5:2
 - e) None of the above
- 19. Two small lights are fixed on a rotating fan blade one near the center and one closer to the edge. The light closer to the edge is 4 cm farther from the center than the one near the middle. If the outer light moves at a constant speed that is twice as fast as the inner one due**

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to the rotation, what is the distance from the center to the outer light?

- a) 4 cm
- b) 6 cm
- c) 8 cm
- d) 10 cm
- e) None of the above