



## **International Vedic Maths Olympiad 2024**

### **Junior**

**Time allowed - 1 Hour**

This Olympiad consists of 40 multiple choice questions.

2 marks are awarded for correct answers for questions 1 - 25

3 marks are awarded for correct answers for questions 26 - 35 and -1 mark for each incorrect answer.

4 marks are awarded for correct answers for questions 36 - 40 and -2 marks for each incorrect answer.

Negative marks for incorrect answers for questions 26 - 40 are to discourage guessing.

Answers, A, B, C, D or E, must be written on the answer sheet provided.

#### ***Rules***

Rough workings can be done on plain paper.

Electronic devices such as computers, calculators, smart watches and mobile phones are not allowed.

Measuring or drawing instruments are not allowed.

**Questions 1 - 25: Score 2 marks for each correct answer.**

1.  $25 + 125 + 225 + 325 + 425 + 525$

- A 1550      B 1650      C 1750      D 1850      E 1950

2. Which of the following is divisible by 18?

- A 11274      B 11282      C 11286      D 11296      E 11312

3.  $\frac{25}{33} - \frac{2}{3}$

- A  $\frac{23}{99}$       B  $\frac{6}{33}$       C  $\frac{23}{30}$       D  $\frac{1}{11}$       E  $\frac{19}{33}$

4. How many zeros are in the answer to  $663663663221 \div 221$ ?

- A 2      B 3      C 4      D 5      E 6

5.  $93^2$

- A 8989      B 8109      C 8479      D 8729      E 8649

6.  $478 \times 994$

- A 4723132      B 472132      C 476132      D 475132      E 475332

7. What is the remainder when 9876543211 is divided by 9?

- A 0      B 1      C 3      D 5      E 7

8. What is the decimal equivalent of the fraction,  $\frac{23}{125}$  ?

- A 0.184      B 0.141      C 0.168      D 0.148      E 0.196

9.  $0.427 \div 0.07$

- A 610      B 61      C 6.1      D 0.61      E 0.061

10. When using Vertically and crosswise to multiply  $3421 \times 5233$ , what is the result of the 4th step before any carry digits have been added?

- A 20      B 26      C 27      D 30      E 32

11.  $6\overline{2734} + 1\overline{3265}$

- A 75999      B 85511      C 64001      D 64400      E 65401

12. A sequence begins 70, 105, 140, 175,...  
What is the 34th term in the sequence?

- A 1090      B 1225      C 1260      D 1295      E 1330

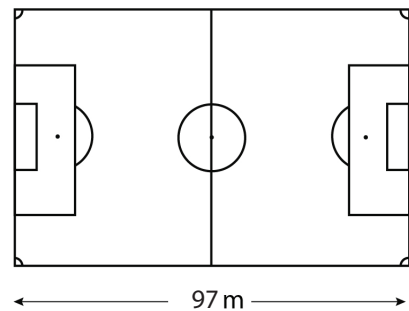
13. For  $24581 \times 9483$ , one of the following answers is correct. Which one?

- A 233102622      B 233101724      C 233101715      D 233101427      E 233101623

14. A rectangular football pitch has an area of  $4656 \text{ m}^2$  and is 97 metres long.

How wide is the pitch?

- A 46 m      B 47 m      C 48 m  
D 49 m      E 53 m



15.  $65^2 = 4225$ . Which sutra makes this calculation very easy?

- A Proportionately  
B By one more than the one before  
C Vertically and crosswise  
D All from 9 and the last from 10  
E All the multipliers

16. What is the mean value (average) of the following five numbers?

- 8.674      8.668      8.677      8.672      8.664  
A 8.669      B 8.670      C 8.671      D 8.672      E 8.673

17. Two of the factors of the current year number, 2024, are 11 and 23. In which year will 11 and 23 next be factors?

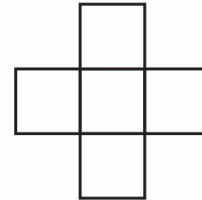
- A 2058      B 2113      C 2197      D 2263      E 2277

18. Which fraction is the largest?

- A  $\frac{3}{4}$       B  $\frac{5}{8}$       C  $\frac{13}{16}$       D  $\frac{25}{32}$       E  $\frac{49}{64}$

19. Two odd cube numbers can be written in the cross shape, one across and one down. What is the shared digit?

- A 1      B 2      C 3      D 4      E 5



20. The world's largest oil tanker, called Happy Giant, carries 657800 tons of oil distributed in 46 equal sized tanks. How many tons of oil does each tank hold?

- A 1430      B 15605      C 14095      D 14300      E 14630

21. Solve,  $\frac{4-2x}{3} = \frac{3}{4} + \frac{5x}{6}$

- A  $\frac{7}{10}$       B  $\frac{7}{12}$       C  $\frac{7}{14}$       D  $\frac{7}{16}$       E  $\frac{7}{18}$

22. Simplify,  $\frac{(4xy^2)^2}{(2x)^3}$

- A  $\frac{4y^4}{x^3}$       B  $\frac{4y^4}{x^2}$       C  $\frac{2y^4}{x}$       D  $\frac{16xy^2}{8x^3}$       E  $\frac{4x^2y^4}{8x^3}$

23. Noriko owns a dog called Scratchy-Shichan. Scratchy-Shichan has a million flees. After treatment with anti-flee shampoo only 1% of flees remain. How many flees have been destroyed?

- A 900,000      B 990,000      C 999,000      D 999,990      E 999,999

24. Which of the following is closest to 99% of 98% of 97% of \$100?

- A \$94.00      B \$94.10      C \$94.11      D \$94.12      E \$94.13

25. 32 workers can harvest 12 hectares of rice paddy in 3 days. Working at the same rate, how many hectares can be harvested by 40 workers in 2 days?

- A 10      B 12      C 15      D 16      E 20

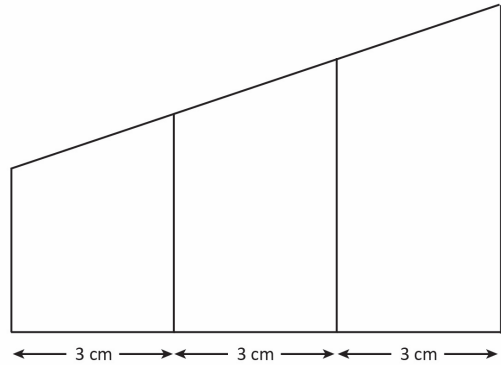
Questions 26 - 35: Score 3 marks for each correct answer. -1 mark for each incorrect answer.

26. In an old system of weights, 16 ounces = 1 pound, 14 pounds = 1 stone, 8 stone = 1 hundredweight and 20 hundredweight = 1 tonne. How many ounces are there in one tonne?

- A 35820      B 35880      C 35940      D 35840      E 36020

27. A trapezium, with an area of  $40.5 \text{ cm}^2$ , is divided into three trapeziums of equal width, 3 cm. The smallest has an area of  $10.5 \text{ cm}^2$ . What is the area of the largest of the three trapeziums?

- A  $13.5 \text{ cm}^2$       B  $14.5 \text{ cm}^2$       C  $15.5 \text{ cm}^2$   
 D  $16.5 \text{ cm}^2$       E  $17.5 \text{ cm}^2$



28. What is the missing value?

- A 72      B 117      C 123  
 D 126      E 148

$$\begin{aligned} \bigcirc + \square - \triangle &= 9 \\ \square + \triangle - \bigcirc &= 63 \\ \bigcirc - \square + \triangle &= 45 \\ \bigcirc + \square + \triangle &= ? \end{aligned}$$

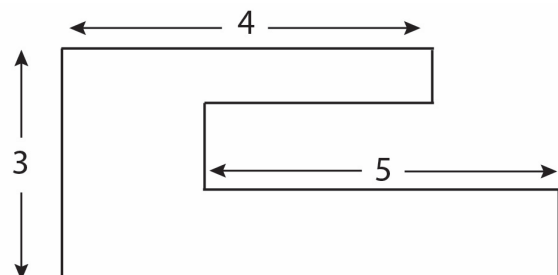
29. Which of the following has a value closest to 0?

- A  $\frac{1}{2} + \frac{1}{3} \times \frac{1}{4}$       B  $\frac{1}{2} + \frac{1}{3} \div \frac{1}{4}$       C  $\frac{1}{2} \times \frac{1}{3} \div \frac{1}{4}$       D  $\frac{1}{2} - \frac{1}{3} \times \frac{1}{4}$       E  $\frac{1}{2} - \frac{1}{3} \div \frac{1}{4}$

30. In the figure all corners are  $90^\circ$ .

What is the perimeter?

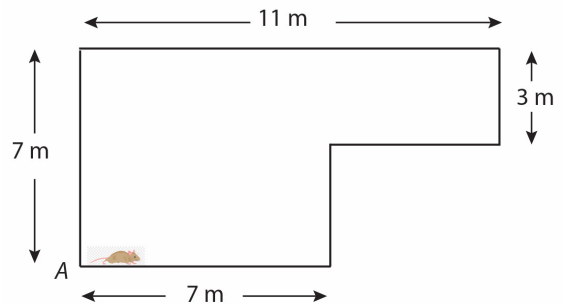
- A 22      B 24      C 26      D 28  
 E Not enough information



31. The mean weight of 97 children in a small school is 41 kg. One more child joins the group and the mean weight increases to 41.1 kg. What is the weight of the new child?

- A 50.8 kg      B 51.8 kg      C 52.8 kg      D 53.8 kg      E 54.8 kg

32. The figure shows the plan of a room measured in metres. A mouse starts at point A and takes 24 seconds to run along the edge until getting back to point A.



How fast does the mouse run in kilometres per hour?

- A 0.25 km/h      B 0.7 km/h      C 4.8 km/h  
D 5.4 km/h      E 6 km/h

33. In the English Premier Division there are 20 football teams. In one season each team plays each other team twice. How many matches are there altogether in one season?

- A 210      B 320      C 380      D 400      E 420

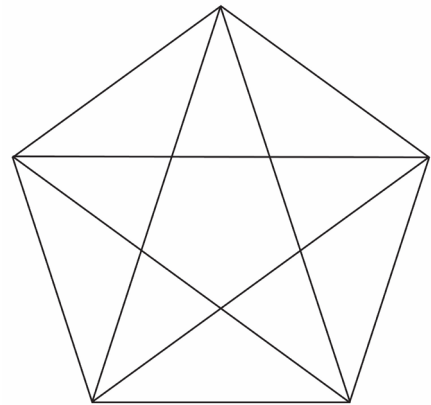
34. How many more 9s are there than zeros are in the answer to  $4699972 \times 9999989$ ?

- A 0      B 1      C 2      D 3      E 4

35. A pentagram is inscribed within a pentagon.

How many triangles are in the diagram?

- A 10      B 25      C 30  
D 35      E 40



Questions 36 - 40: Score 4 marks for each correct answer. -2 marks for each incorrect answer.

36. In the Yin Yan symbol the diameter of the small circles are  $\frac{1}{6}$ th the diameter of the whole shape. What is the ratio of the area of the small white circle to the area of the large shaded area?



- A 1 : 9      B 1 : 12      C 1 : 17  
D 1 : 18      E 1 : 35

37. 15 and 21 are two factors of a certain number. The number has eight factors. What is the sum of the factors?

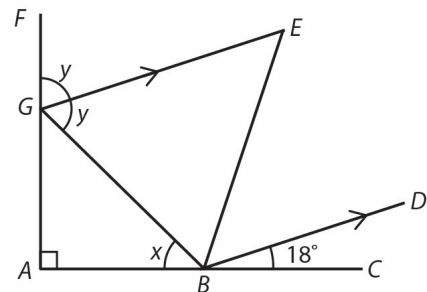
- A 87      B 192      C 226      D 384      E 474

38. Identical small cubes are put together to make a large solid cube. 240 of the small cubes each touch 4 other small cubes, face to face. How many small cubes make up the large cube?

- A 2400      B 4800      C 6400      D 8000      E 10648

39. In the figure,  $BD$  is parallel to  $GE$ ,  $\hat{GAB} = 90^\circ$ ,  $\hat{FGE} = \hat{EGB} = y$  and  $\hat{CBD} = 18^\circ$ . What is angle  $x$ ?

- A  $54^\circ$       B  $56^\circ$       C  $58^\circ$   
D  $60^\circ$       E  $62^\circ$



40. How many numbers larger than 60,000 and less than 80,000 are there such that the product of their digits is 42?

- A 18      B 20      C 22      D 24      E 26