

Class 10 · Mathematics Olympiad

Total questions 50	Total marks 60	Time 60 minutes	Negative marking None
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Each question has four options, of which only one is correct. Mark your answer on the answer sheet. The Achievers Section carries higher marks per question. The answer key with full solutions is at the end of this paper.

This is original practice material written to the Level 1 pattern. It is not a past paper and is not affiliated with SOF or any official olympiad body.

Logical Reasoning

15 questions · 1 mark each · 15 marks

Q1. If RAT is written as 18 - 1 - 20 using the positions of the letters in the alphabet, how is BAG written?

- (A) 7 - 1 - 2 (B) 3 - 2 - 8 (C) 2 - 1 - 7 (D) 25 - 26 - 20

Q2. Which one does NOT belong with the others?

- (A) Iron (B) Wood (C) Gold (D) Copper

Q3. Pointing to a boy in a photograph, Meera said, "He is the son of my paternal grandfather's only son." How is the boy related to Meera?

- (A) Nephew (B) Cousin (C) Brother (D) Uncle

Q4. In a certain code BUS is written as FYW. How is CAT written in that code?

- (A) GEX (B) HFY (C) XEG (D) YWP

Q5. Three of the following four are alike and form a group. Which one does NOT belong?

- (A) Iron (B) Silver (C) Copper (D) Plastic

Q6. In the first row the numbers are 5, 5 and 24. In the second row they are 9, 8 and 71. In the third row they are 3, 2 and ____ . The same rule applies to every row.

- (A) 7 (B) 6 (C) 5 (D) 4

Q7. Meera walks 7 m towards north, turns right and walks 8 m, then turns right again and walks 7 m. How far is Meera from the starting point, and in which direction?

- (A) 15 m, North (B) 8 m, West (C) 7 m, East (D) 8 m, East

Q8. Which letter comes next? C, E, H, L, ____

- (A) Q (B) O (C) P (D) R

Q9. In a class, 12 students play cricket, 16 play football and 4 play both games. Every student plays at least one of the two. How many students are there in the class?

- (A) 24 (B) 25 (C) 20 (D) 28

Q10. Read the statements and choose the conclusion that MUST be true.

All squares are rectangles. All rectangles have four sides.

- (A) All rectangles are squares. (B) All squares have four sides.
(C) No rectangle is a square. (D) Some squares have three sides.

Q11. Which letter comes next? A, D, G, J, ____

- (A) N (B) M (C) L (D) P

Q12. In a row of 42 children, Ravi is 12th from the left end. What is Ravi's position from the right end?

- (A) 32th (B) 33th (C) 31th (D) 30th

Q13. Which word would come FIRST in a dictionary?

- (A) mango (B) metal (C) museum (D) mother

Q14. In a queue, Nita is 9th from the front and 11th from the back. How many people are in the queue altogether?

- (A) 20 (B) 21 (C) 19 (D) 18

Q15. Book : Library :: Medicine : ____

- (A) Bakery (B) Garage (C) Pharmacy (D) Studio

Mathematical Reasoning

20 questions · 1 mark each · 20 marks

Q16. At 6 a.m. the temperature was 16°C . By noon it had risen by 5°C , and by night it had fallen by 3°C . What was the temperature at night?

- (A) 21°C (B) 18°C (C) 16°C (D) 20°C

Q17. Which of these fractions is the greatest?

- (A) $\frac{4}{7}$ (B) $\frac{7}{12}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$

Q18. The perimeter of a square is 56 cm. What is its area?

- (A) 56 sq cm (B) 225 sq cm (C) 196 sq cm (D) 210 sq cm

Q19. $4\text{ L } 600\text{ mL} \times 2 = ?$

- (A) 10 L 200 mL (B) 9 L 300 mL (C) 9 L 200 mL (D) 9 L 100 mL

Q20. $10,560 \div 33 = ?$

- (A) 320 (B) 321 (C) 330 (D) 310

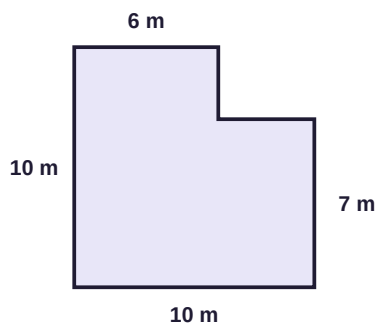
Q21. $\frac{2}{6} + \frac{11}{12} = ?$

- (A) $1\frac{1}{12}$ (B) $1\frac{1}{3}$ (C) $1\frac{1}{4}$ (D) $1\frac{3}{4}$

Q22. What is the smallest number that can be divided exactly by both 6 and 18?

- (A) 12 (B) 9 (C) 18 (D) 36

Q23. The figure shows a plot of land. What is its area?



- (A) 100 sq m (B) 88 sq m (C) 84 sq m (D) 91 sq m

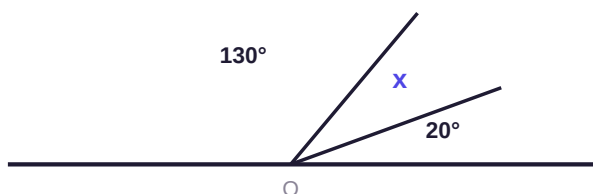
Q24. What is the place value of 5 in the number 56,88,64,680?

- (A) 5,00,00,00,000 (B) 5
(C) 5,00,00,000 (D) 50,00,00,000

Q25. Round 46,134 to the nearest thousand.

- (A) 46,100 (B) 46,000 (C) 47,000 (D) 45,000

Q26. In the given figure, find the value of x.



- (A) 20° (B) 50° (C) 40° (D) 30°

Q27. $6,45,469 - 2,70,386 = ?$

- (A) 3,75,183 (B) 3,75,083 (C) 3,85,083 (D) 3,75,073

Q28. Find the next number: 2, 6, 12, 20, 30, ____

- (A) 40 (B) 48 (C) 44 (D) 42

Q29. $243 \times 50 = ?$

- (A) 12,150 (B) 12,100 (C) 12,393 (D) 12,250

Q30. 7.3 km = _____ m

- (A) 73 (B) 73,000 (C) 730 (D) 7,300

Q31. 9 kg 450 g - 8 kg 320 g = ?

- (A) 1 kg 70 g (B) 1 kg 130 g (C) 2 kg 130 g (D) 1 kg 230 g

Q32. $26 - 1.65 = ?$

- (A) 24.25 (B) 24.45 (C) 24.35 (D) 25.35

Q33. At 6 a.m. the temperature was 10°C. By noon it had risen by 11°C, and by night it had fallen by 9°C. What was the temperature at night?

- (A) 12°C (B) 14°C (C) 10°C (D) 21°C

Q34. The perimeter of a square is 52 cm. What is its area?

- (A) 182 sq cm (B) 52 sq cm (C) 196 sq cm (D) 169 sq cm

Q35. 6 L 250 mL $\times 3 = ?$

- (A) 19 L 750 mL (B) 18 L 750 mL (C) 18 L 650 mL (D) 18 L 850 mL

Everyday Mathematics

10 questions · 1 mark each · 10 marks

Q36. A shopkeeper sells 9 kg of rice at ₹ 29 per kg. How much money does he receive?

- (A) ₹ 270 (B) ₹ 161 (C) ₹ 261 (D) ₹ 361

- Q37. One dozen pens cost ₹ 336. What is the cost of 7 pens?
 (A) ₹ 252 (B) ₹ 168 (C) ₹ 224 (D) ₹ 196
- Q38. A book has 342 pages. Ritu reads 34 pages every day for 9 days. How many pages are still left?
 (A) 36 (B) 31 (C) 306 (D) 41
- Q39. An auto charges ₹ 30 for the first kilometre and ₹ 14 for every kilometre after that. What is the fare for a journey of 11 km?
 (A) ₹ 171 (B) ₹ 184 (C) ₹ 156 (D) ₹ 170
- Q40. A rope 14.4 m long is cut into pieces each 80 cm long. How many complete pieces are obtained?
 (A) 18 (B) 20 (C) 16 (D) 23
- Q41. In a class of 28 students, $\frac{1}{4}$ are girls. How many boys are there?
 (A) 21 (B) 16 (C) 26 (D) 7
- Q42. A train leaves at 5:20 a.m. and reaches its destination at 1:14 p.m. on the same day. How long is the journey?
 (A) 6 h 54 min (B) 7 h 44 min (C) 7 h 54 min (D) 8 h 54 min
- Q43. A water tank holds 320 litres. If $\frac{1}{4}$ of the water is used, how much water is left?
 (A) 215 L (B) 265 L (C) 240 L (D) 80 L
- Q44. A wall is 8 m long and 3 m high. How many square tiles of side 25 cm are needed to cover it completely?
 (A) 192 (B) 384 (C) 768 (D) 396
- Q45. A shopkeeper sells 15 kg of rice at ₹ 47 per kg. How much money does he receive?
 (A) ₹ 605 (B) ₹ 720 (C) ₹ 805 (D) ₹ 705

Achievers Section

5 questions · 3 marks each · 15 marks

- Q46. If LAMP is coded as ODPS, how is ROAD coded?
 (A) URDG (B) OLXA (C) GDRU (D) XUGJ
- Q47. Using each of the digits 3, 8, 7, 0 exactly once, what is the smallest 4-digit number that can be formed?
 (A) 8730 (B) 3087 (C) 3078 (D) 0378
- Q48. The average of 5 numbers is 26. 4 of them are 16, 34, 16, 16. What is the remaining number?
 (A) 48 (B) 50 (C) 46 (D) 26
- Q49. 3 taps together fill a tank in 120 minutes. How long will 10 taps of the same kind take to fill it?
 (A) 36 minutes (B) 33 minutes (C) 39 minutes (D) 120 minutes
- Q50. The binary number 1000 equals which decimal number?
 (A) 1000 (B) 4 (C) 16 (D) 8

Answer Key

1	2	3	4	5	6	7	8	9	10
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C	B	C	A	D	C	D	A	A	B
11	12	13	14	15	16	17	18	19	20
B	C	A	C	C	B	D	C	C	A
21	22	23	24	25	26	27	28	29	30
C	C	B	D	B	D	B	D	A	D
31	32	33	34	35	36	37	38	39	40
B	C	A	D	B	C	D	A	D	A
41	42	43	44	45	46	47	48	49	50
A	C	C	B	D	A	C	A	A	D

Solutions

Q1. (C) B is letter 2 and A is letter 1 and G is letter 7, so BAG = 2 - 1 - 7.

Q2. (B) Wood is not a metal.

Q3. (C) Meera's paternal grandfather's only son is Meera's own father, so that man's son is Meera's own sibling. The answer is Brother.

Q4. (A) Each letter moves 4 place(s) forward in the alphabet, so CAT becomes GEX.

Q5. (D) Silver, Copper, Iron are all metals; Plastic is not.

Q6. (C) The rule is: multiply the two numbers, then subtract 1. Check: 5, 5 gives 24 and 9, 8 gives 71; so 3, 2 gives 5.

Q7. (D) The two 7 m walks (north, then south) cancel out, leaving only the 8 m walked towards the east. So the answer is 8 m, East.

Q8. (A) The gaps grow by one each time (+2, +3, +4, +5), so after L the next letter is Q.

Q9. (A) $12 + 16 - 4 = 24$. The 4 who play both were counted twice, so they are subtracted once.

Q10. (B) From "All squares are rectangles. All rectangles have four sides." it follows necessarily that all squares have four sides.

Q11. (B) Each letter moves 3 place(s) forward in the alphabet, so after J comes M.

Q12. (C) Position from the right = total - position from the left + 1 = $42 - 12 + 1 = 31$ th.

Q13. (A) In alphabetical order the words run mango, metal, mother, museum, so mango comes first.

Q14. (C) Counting Nita only once: $9 + 11 - 1 = 19$ people.

Q15. (C) The second word relates to the first in the same way Pharmacy relates to Medicine.

Q16. (B) $16 + 5 = 21$, then $21 - 3 = 18^\circ\text{C}$.

Q17. (D) As decimals: $4/7 = 0.571$, $7/12 = 0.583$, $5/6 = 0.833$, $2/3 = 0.667$. The greatest is $5/6$.

Q18. (C) Side = $56 / 4 = 14$ cm, so area = $14 \times 14 = 196$ sq cm.

Q19. (C) 4 L 600 mL = 4,600 mL. $4,600 \times 2 = 9,200$ mL = 9 L 200 mL.

Q20. (A) $33 \times 320 = 10,560$, so the quotient is 320.

Q21. (C) Make the denominators the same (12): $2/6 = 4/12$ and $11/12 = 11/12$. Adding gives $15/12 = 1 \frac{1}{4}$.

Q22. (C) Listing multiples of 6 and of 18, the first number that appears in both lists is 18.

Q23. (B) The missing corner is $(10 - 6) = 4$ m wide and $(10 - 7) = 3$ m tall. Take the full rectangle $10 \text{ m} \times 10 \text{ m} = 100$ sq m and subtract that corner, $4 \text{ m} \times 3 \text{ m} = 12$ sq m. $100 - 12 = 88$ sq m.

Q24. (D) The digit 5 stands in the 10,00,00,000 place, so its place value is 50,00,00,000.

Q25. (B) The hundreds digit is 1, so we round down to 46,000.

Q26. (D) The three angles lie on a straight line, so they add to 180° . $x = 180^\circ - 130^\circ - 20^\circ = 30^\circ$.

- Q27. (B) $6,45,469 - 2,70,386 = 3,75,083$.
- Q28. (D) The gaps are 4, 6, 8, 10, so the next gap is 12 and $30 + 12 = 42$.
- Q29. (A) $243 \times 50 = 243 \times 50 + 243 \times 0 = 12,150 + 0 = 12,150$.
- Q30. (D) $1 \text{ km} = 1,000 \text{ m}$, so $7.3 \text{ km} = 7.3 \times 1,000 = 7,300 \text{ m}$.
- Q31. (B) $9 \text{ kg } 450 \text{ g} = 9,450 \text{ g}$ and $8 \text{ kg } 320 \text{ g} = 8,320 \text{ g}$. $9,450 - 8,320 = 1,130 \text{ g} = 1 \text{ kg } 130 \text{ g}$.
- Q32. (C) Write 26 as 26.00, then $26.00 - 1.65 = 24.35$.
- Q33. (A) $10 + 11 = 21$, then $21 - 9 = 12^\circ\text{C}$.
- Q34. (D) Side = $52 / 4 = 13 \text{ cm}$, so area = $13 \times 13 = 169 \text{ sq cm}$.
- Q35. (B) $6 \text{ L } 250 \text{ mL} = 6,250 \text{ mL}$. $6,250 \times 3 = 18,750 \text{ mL} = 18 \text{ L } 750 \text{ mL}$.
- Q36. (C) $9 \times 29 = ₹ 261$.
- Q37. (D) One pen costs $336 / 12 = ₹ 28$, so 7 pens cost $7 \times 28 = ₹ 196$.
- Q38. (A) She reads $34 \times 9 = 306$ pages, so $342 - 306 = 36$ pages are left.
- Q39. (D) After the first kilometre there are 10 more: $30 + 10 \times 14 = ₹ 170$.
- Q40. (A) $14.4 \text{ m} = 1,440 \text{ cm}$ and $1,440 / 80 = 18$ pieces.
- Q41. (A) $1/4$ of 28 = 7 girls, so the number of boys is $28 - 7 = 21$.
- Q42. (C) From 5:20 a.m. to 1:14 p.m. is 7 h 54 min.
- Q43. (C) $1/4$ of 320 = 80 L is used, so $320 - 80 = 240 \text{ L}$ is left.
- Q44. (B) The wall is $800 \text{ cm} \times 300 \text{ cm} = 2,40,000 \text{ sq cm}$. Each tile is $25 \times 25 = 625 \text{ sq cm}$. $2,40,000 / 625 = 384$ tiles.
- Q45. (D) $15 \times 47 = ₹ 705$.
- Q46. (A) Every letter moves 3 place(s) forward, so ROAD becomes URDG.
- Q47. (C) A 4-digit number cannot begin with 0, so the smallest possible first digit is 3. The remaining digits are then placed in increasing order: 3078.
- Q48. (A) The 5 numbers add up to $26 \times 5 = 130$. The given numbers add up to 82, so the missing number is $130 - 82 = 48$.
- Q49. (A) One tap alone would take $3 \times 120 = 360$ minutes. With 10 taps the time is $360 / 10 = 36$ minutes.
- Q50. (D) 1000 in binary is $1 \times 8 + 0 \times 4 + 0 \times 2 + 0 \times 1 = 8$.

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