STUDENT COPY · SET A

Class 9 · Mathematics Olympiad

Total questions	Total marks	Time	Negative marking
50	60	60 minutes	None

Name: _____ Class/Section: _____ Roll no: _____

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. Your teacher has the answers.
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Logical Reasoning

15 questions · 1 mark each · 15 marks

Q1. Five friends A, B, C, D and E sit in a row of five seats. A sits at the extreme left end, D sits at the extreme right end, C sits exactly in the middle and B sits between A and C. Who sits in the fourth seat from the left?

(A) D (B) E (C) C (D) B

Q2. In a class, 12 students play cricket, 18 play football and 7 play both games. Every student plays at least one of the two. How many students are there in the class?

(A) 23 (B) 24 (C) 16 (D) 30

Q3. Which one does NOT belong with the others?

(A) Crow (B) Sparrow (C) Bat (D) Parrot

Q4. In a certain code TIN is written as XMR. How is MAP written in that code?

(A) QET (B) RFU (C) IWL (D) TEQ

Q5. All but one of these numbers are multiples of the same number. Find the one that is not: 13, 18, 24, 30, 33

(A) 24 (B) 33 (C) 13 (D) 30

Q6. Which letter comes next? K, M, O, Q, ___

(A) S (B) U (C) T (D) R

Q7. If the 12th of a month is a Saturday, what day of the week is the 23rd of the same month?

(A) Friday (B) Wednesday (C) Thursday (D) Tuesday

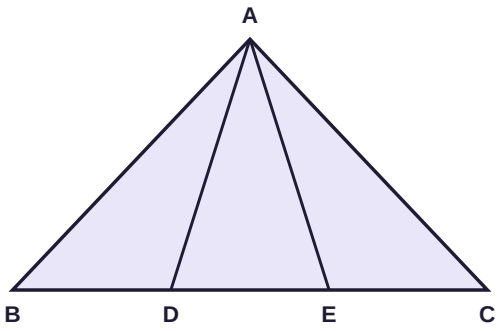
Q8. Which word would come FIRST in a dictionary?

(A) melon (B) maple (C) mango (D) monkey

Q9. Find the next number in the pattern: 2, 6, 14, 30, ___

(A) 64 (B) 63 (C) 62 (D) 60

Q10. How many triangles are there in the given figure?



(A) 5 (B) 8 (C) 6 (D) 7

Q11. 6 : 36 :: 9 : ___

(A) 81 (B) 18 (C) 100 (D) 64

Q12. In the first row the numbers are 2, 4 and 12. In the second row they are 5, 3 and 16. In the third row they are 5, 2 and ___ . The same rule applies to every row.

(A) 15 (B) 14 (C) 16 (D) 13

Q13. Pointing to a boy in a photograph, Meera said, “This boy is not me, but he is the son of my paternal grandfather’s only son.” How is the boy related to Meera?

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

Q14. Kabir walks 5 m towards north, turns right and walks 3 m, then turns right again and walks 5 m. How far is Kabir from the starting point, and in which direction?

(A) 3 m, West (B) 8 m, North (C) 5 m, East (D) 3 m, East

Q15. Three of the following four are alike and form a group. Which one does NOT belong?

(A) Mango (B) Banana (C) Potato (D) Guava

Mathematical Reasoning

20 questions · 1 mark each · 20 marks

Q16. Midpoints of all sides of quadrilateral ABCD are joined in order. If AC=12 cm and BD=16 cm, what is the new perimeter?

(A) 14 cm (B) 28 cm (C) 48 cm (D) 56 cm

Q17. On a map, Meena starts at (2,-1), walks 5 units west and 3 units north. What point does she reach?

(A) (-3,2) (B) (-3,-4) (C) (7,2) (D) (5,3)

Q18. If $2^x=3$, what is the value of $8^x \div 2^{x+1}$?

(A) 9/2 (B) 9 (C) 27/2 (D) 27/4

Q19. In triangular garden ABC, M and N are midpoints of AB and AC. A fence MN is 18 m and parallel to BC. How long is BC?

(A) 36 m (B) 54 m (C) 9 m (D) 18 m

Q20. A triangle has sides 13 cm, 14 cm and 15 cm. What is its altitude to the 14 cm side?

(A) 12 cm (B) 14 cm (C) 6 cm (D) 10 cm

Q21. A bag has 3 red, 4 blue and 5 green beads. One bead is picked without looking. What is the probability it is not blue?

(A) 2/3 (B) 7/12 (C) 1/3 (D) 5/12

Q22. A cube of side 6 cm is cut into small cubes of side 2 cm. By how much does the total surface area increase?

(A) 288 cm^2 (B) 432 cm^2

(C) 648 cm^2 (D) 216 cm^2

Q23. A square rangoli has side $(\sqrt{50} + \sqrt{8})$ cm. What is its perimeter?

(A) $56\sqrt{2}$ cm (B) $28\sqrt{2}$ cm (C) 28 cm (D) $14\sqrt{2}$ cm

Q24. A chord is 5 cm from the centre of a circle of radius 13 cm. Its length is

(A) 26 cm (B) 18 cm (C) 24 cm (D) 12 cm

Q25. Two straight footpaths cross. One angle is 3 times its adjacent angle. What is the smaller angle?

(A) 45° (B) 60° (C) 135° (D) 30°

Q26. Point P is on the x-axis and is equidistant from A(2,3) and B(6,1). Find P.

(A) (3,0) (B) (3,3) (C) (0,3) (D) (4,0)

Q27. A camera folder has 2^6 albums, each with 2^{10} photos. How many photos are there in all?

(A) 2^{16} photos (B) $2^{10} + 2^6$ photos

(C) 2^{60} photos (D) 2^4 photos

Q28. If $x+y=5$ and $x^2+y^2=13$, find x^3+y^3.

(A) 65 (B) 125 (C) 35 (D) 95

Q29. Cubical gift wax of side 6 cm is melted into small cubes of side 2 cm. How many small cubes are made?

(A) 27 cubes (B) 54 cubes (C) 18 cubes (D) 9 cubes

Q30. For data 4,5,5,6,8,8,8,10, one 8 is changed to 6. Which measure remains unchanged?

(A) Median (B) Mean (C) Mode (D) Range

Q31. A floor tile is a parallelogram. Its adjacent angles are $(2x+10)°$ and $(3x-5)°$. What is the smaller angle?

(A) 90° (B) 80° (C) 70° (D) 100°

Q32. A cylinder's radius is doubled and its height is halved. Its volume becomes

(A) same as original (B) twice the original

(C) half the original (D) four times original

Q33. An auto fare plan A is ₹30+₹8 per km; plan B is ₹50+₹6 per km. At what distance are the fares equal?

(A) 20 km (B) 8 km (C) 10 km (D) 5 km

Q34. For data 2, 4, 4, 5, 7, 9, if 9 is changed to 15, which measure increases by exactly 1?

(A) Range (B) Mode (C) Mean (D) Median

Q35. A circular rangoli has centre O. Chord AB is 16 cm, and the perpendicular from O to AB is 6 cm. What is the radius?

(A) 8 cm (B) 10 cm (C) $\sqrt{52}$ cm (D) 14 cm

Everyday Mathematics

10 questions · 1 mark each · 10 marks

Q36. A photo drive has 2^{18} bytes free, and each thumbnail uses 2^{10} bytes. How many thumbnails fit exactly?

(A) 1024 (B) 256 (C) 128 (D) 512

Q37. A cubical gift box of edge 6 cm is cut into identical small cubes of edge 2 cm, with no waste. How many small cubes are made?

(A) 27 (B) 9 (C) 36 (D) 18

Q38. A cylindrical tin has radius 7 cm and height 10 cm. For a label covering only the curved side, what area is needed? Use $\pi = 22/7$.

(A) 748 cm^2 (B) 220 cm^2

(C) 440 cm^2 (D) 154 cm^2

Q39. A shop's shelf code is $p(x) = x^3 - 5x + 2$. For a check, it is divided by $x - 4$. What is the remainder?

(A) 46 (B) 42 (C) -14 (D) -42

Q40. A square mat has area 72 m^2. Between which two whole metre marks is its side length?

(A) 7 m and 8 m (B) 6 m and 7 m (C) 9 m and 10 m (D) 8 m and 9 m

Q41. At a museum, 2 adult and 3 child tickets cost ₹310; 3 adult and 2 child tickets cost ₹340. What is the price of one adult ticket?

(A) ₹80 (B) ₹70 (C) ₹50 (D) ₹90

Q42. A carpenter joins rods of lengths $\sqrt{50}$ m and $\sqrt{8}$ m for a shelf support. What is the total length in simplest form?

(A) 14 m (B) $7\sqrt{2}$ m (C) $\sqrt{58}$ m (D) $13\sqrt{2}$ m

Q43. A shop floor is 99 m long and 101 m wide. Using an identity, what is its area?

(A) 9998 m^2 (B) 9999 m^2

(C) 10000 m^2 (D) 10001 m^2

Q44. A packing app uses $p(x) = x^3 + kx - 10$. For box size $x = 2$ there must be no leftover, so $x - 2$ is a factor. What is k?

(A) 1 (B) −1 (C) 9 (D) 5

Q45. A shop's batch code $P(x) = x^3 - 4x^2 + x + 6$ is accepted if $x - 3$ is a factor. By the factor theorem, what result is obtained?

(A) Accepted; remainder 3 (B) Rejected; remainder −60

(C) Rejected; remainder 6 (D) Accepted; remainder 0

Achievers Section

5 questions · 3 marks each · 15 marks

Q46. A bar graph has bars for marks 10,20,30,40 with frequencies 3,5,4,2. If one 20 is added and one 40 is removed, what is the new mean?

(A) 155/14 (B) 165/7 (C) 22 (D) 155/7

Q47. If x-2 is a factor of $p(x)=x^3+kx^2-5x+6$, what is the remainder when p(x) is divided by x+1?

(A) 0 (B) -9 (C) 9 (D) 11

Q48. If $A=(\sqrt{5}+\sqrt{3})/(\sqrt{5}-\sqrt{3})$, what is A+1/A?

(A) 4 (B) 16 (C) $8\sqrt{15}$ (D) 8

Q49. For $p(x)=x^3+ax^2-7x+6$, p(x) is divisible by x-2. What is the remainder when p(x) is divided by x+1?

(A) 0 (B) -2 (C) 14 (D) 12

Q50. In triangle ABC, D and E are midpoints of AB and AC. If AB=12 cm, AC=14 cm and DE=5 cm, find the perimeter of quadrilateral BDEC.

(A) 41 cm (B) 18 cm (C) 23 cm (D) 28 cm

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