STUDENT COPY · SET B

Class 10 · 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. Three of the following four are alike and form a group. Which one does NOT belong?

(A) Ginger (B) Lotus (C) Jasmine (D) Rose

Q2. Which word would come FIRST in a dictionary?

(A) matter (B) minute (C) monkey (D) melon

Q3. Which letter comes next? C, E, H, L, ___

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

Q4. Nila walks 5 m north, then 8 m east, then 2 m south. Where is Nila now, relative to the starting point?

(A) 5 m north and 8 m east (B) 3 m north and 8 m east

(C) 3 m north and 9 m east (D) 4 m north and 8 m east

Q5. In a certain code HAT is written as JCV. How is DOG written in that code?

(A) FQI (B) GRJ (C) BME (D) IQF

Q6. A father is 26 years older than his son. The son is 5 years old now. How old will the father be after 7 years?

(A) 39 years (B) 45 years (C) 31 years (D) 38 years

Q7. Anita walks 7 m towards north, turns right and walks 3 m, then turns right again and walks 7 m. How far is Anita from the starting point, and in which direction?

(A) 3 m, East (B) 3 m, West (C) 10 m, North (D) 7 m, East

Q8. In a class, 20 students play cricket, 15 play football and 10 play both games. Every student plays at least one of the two. How many students are there in the class?

(A) 26 (B) 15 (C) 25 (D) 35

Q9. If the 12th of a month is a Thursday, what day of the week is the 23rd of the same month?

(A) Sunday (B) Monday (C) Tuesday (D) Wednesday

Q10. 12 : 144 :: 13 : ___

(A) 144 (B) 169 (C) 26 (D) 196

Q11. Read the statements and choose the conclusion that MUST be true.
All roses are flowers. All flowers need water.

(A) All flowers are roses. (B) Some roses do not need water.

(C) All roses need water. (D) Only roses need water.

Q12. In a row of 30 children, Ravi is 11th from the left end. What is Ravi's position from the right end?

(A) 22nd (B) 21st (C) 19th (D) 20th

Q13. In the first row the numbers are 8, 4 and 30. In the second row they are 7, 2 and 12. In the third row they are 2, 2 and ___ . The same rule applies to every row.

(A) 1 (B) 2 (C) 4 (D) 3

Q14. Which one does NOT belong with the others?

(A) March (B) July (C) August (D) April

Q15. Which of these figures has exactly 4 lines of symmetry?



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

Mathematical Reasoning

20 questions · 1 mark each · 20 marks

Q16. Which point on the x-axis is equidistant from (0,0) and (6,8)?

(A) (25/3, 0) (B) (10, 0) (C) (3, 0) (D) (5, 0)

Q17. For an acute angle θ, tan θ = 3/4. What is (sin θ + cos θ) ÷ (sec θ + cosec θ)?

(A) 7/5 (B) 25/12 (C) 24/25 (D) 12/25

Q18. A bag has 3 red, 4 blue and 5 green balls. Two balls are drawn without replacement. What is the probability that they have the same colour?

(A) 25/72 (B) 5/22 (C) 19/66 (D) 1/3

Q19. In an AP, the 3rd term is 7 and the 8th term is 22. What is the smallest n for which $S_n > 300$?

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

Q20. An AP has sum $S_n=3n^2+2n$ for its first n terms. What is its 10th term?

(A) 62 (B) 59 (C) 65 (D) 56

Q21. In an AP, the first term is 2 and the sum of the first 6 terms is three times the sum of the first 3 terms. What is the common difference?

(A) 3 (B) −1 (C) 2 (D) 1

Q22. For $x^2+(m-3)x+m=0$ to have equal roots, what is the sum of all possible m-values?

(A) 9 (B) 10 (C) 8 (D) 1

Q23. A circular rangoli of radius 7 cm has a 90° sector coloured blue. Using π=22/7, what area is left uncoloured?

(A) 38.5 cm^2 (B) 115.5 cm^2

(C) 77 cm^2 (D) 154 cm^2

Q24. Two dice are thrown. Given that the sum is even, what is the probability that both numbers are odd?

(A) 2/3 (B) 1/2 (C) 1/4 (D) 1/3

Q25. For $p(x)=kx^2-6x+4$, its zeroes are α and β with α=2β. What is k?

(A) 2 (B) 4 (C) 1 (D) 3

Q26. In ΔABC, AB=6, AC=8, BC=10. Points P on AB and Q on AC have AP:PB = AQ:QC = 1:2. What is PQ?

(A) 10/3 (B) 10 (C) 20/3 (D) 5

Q27. Two similar triangles have areas 49 cm^2 and 81 cm^2. If the smaller perimeter is 28 cm, what is the larger perimeter?

(A) 36 cm (B) 324/7 cm (C) 32 cm (D) 40 cm

Q28. Which point on the x-axis is equidistant from A(1,2) and B(5,6)?

(A) (0,7) (B) (-7,0) (C) (3,0) (D) (7,0)

Q29. A two-digit number is 4 times the sum of its digits. Reversing its digits increases it by 18. What is the number?

(A) 24 (B) 36 (C) 18 (D) 42

Q30. A sector of radius 14 cm has central angle 90°. What is its perimeter?

(A) 56+7π cm (B) 28+7π cm (C) 28+14π cm (D) 14+7π cm

Q31. For positive integers a<b, HCF(a,b)=18 and LCM(a,b)=378. If a is not 18, what is (a,b)?

(A) (36, 189) (B) (42, 162) (C) (18, 378) (D) (54, 126)

Q32. The zeroes of q(x) are the reciprocals of the zeroes of $2x^2 - 7x + 3$. Which q(x) can be chosen?

(A) $3x^2 - 7x + 2$ (B) $3x^2 + 7x + 2$

(C) $2x^2 - 7x + 3$ (D) $2x^2 - 3x + 7$

Q33. In ΔABC, D lies on AB and E on AC, with DE parallel to BC. If AD:DB = 2:3 and area of ΔADE is 24 cm^2, find area of DBCE.

(A) 96 cm^2 (B) 150 cm^2

(C) 60 cm^2 (D) 126 cm^2

Q34. Two fair dice are thrown. What is the probability that the sum is 8 or the product is odd?

(A) 1/3 (B) 5/36 (C) 1/4 (D) 7/18

Q35. The lines ax + 2y = 8 and 3x + y = 7 meet at a point where x = y. What is a?

(A) 10/7 (B) 18 (C) 18/7 (D) 16/7

Everyday Mathematics

10 questions · 1 mark each · 10 marks

Q36. From point P outside a circle, tangents PA and PB touch it. If PA=3x+2 cm and PB=5x−10 cm, find PA.

(A) 30 cm (B) 20 cm (C) 22 cm (D) 18 cm

Q37. In 5 cricket scores, the mean is 18. Four scores are 12, 20, 15, 25. If 12 is dropped, what is the mean of the remaining 4 scores?

(A) 20 runs (B) 15.6 runs (C) 19.5 runs (D) 18 runs

Q38. A ramp makes angle θ with the ground. If sin θ=3/5, what is cos θ+tan θ?

(A) 24/25 (B) 7/5 (C) 31/20 (D) 29/20

Q39. A milk booth is on the straight road from A(2,3) to B(11,15), dividing AB in the ratio 1:2 from A to B. What are its coordinates?

(A) (5, 7) (B) (8, 11) (C) (5, 9) (D) (6.5, 9)

Q40. Ravi sees the top of a 12 m pole at 30°. He walks $8\sqrt{3}$ m straight towards the pole. What is the new angle of elevation?

(A) 60° (B) 45° (C) 30° (D) 75°

Q41. From a point 30 m from a tower, the angle of elevation of its top is 30°. What is the tower height? Use √3 exactly.

(A) 10 m (B) $15\sqrt{3}$ m (C) $30\sqrt{3}$ m (D) $10\sqrt{3}$ m

Q42. A bus depot parks 8 buses in the first row, 11 in the second, 14 in the third, and so on. How many buses are in the 12th row?

(A) 41 buses (B) 38 buses (C) 44 buses (D) 33 buses

Q43. A rectangular sign has area $x^2+7x+12$ m^2 and length x+3 m. Which expression is its breadth?

(A) x+3 m (B) x+4 m (C) x+7 m (D) x+12 m

Q44. A 1.5 m stick casts a 2 m shadow. At the same time, a tree casts a 10 m shadow. What is the tree's height?

(A) 6.5 m (B) 8 m (C) 7.5 m (D) 13.5 m

Q45. A shop packs 84 pens and 126 pencils into identical gift packs with no item left. What is the greatest number of packs possible?

(A) 42 packs (B) 210 packs (C) 21 packs (D) 84 packs

Achievers Section

5 questions · 3 marks each · 15 marks

Q46. What is the greatest number that divides 437, 541 and 697 leaving the same remainder each time?

(A) 104 (B) 52 (C) 21 (D) 26

Q47. At a stationery shop, 2 pens and 3 notebooks cost ₹96, while 3 pens and 2 notebooks cost ₹89. What is the cost of 5 pens and 5 notebooks?

(A) ₹175 (B) ₹178 (C) ₹185 (D) ₹192

Q48. For an acute angle θ, sin θ + cos θ = 7/5. What is tan θ + cot θ?

(A) 24/25 (B) 25/12 (C) 12/25 (D) 7/5

Q49. The solution of 3x+2y=19 and kx-2y=7 lies on x=2y-1. What is k?

(A) 5/3 (B) 25/18 (C) 25/9 (D) 9/25

Q50. In ΔABC, D is on AB and E is on AC with DE || BC. If AD:DB = 2:3 and BC = 15 cm, find DE and area(ΔADE):area(DBCE).

(A) 9 cm, 4:21 (B) 6 cm, 4:21 (C) 10 cm, 2:3 (D) 6 cm, 4:25

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