STUDENT COPY · SET A

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. Which letter comes next? I, L, O, R, ___

(A) U (B) X (C) V (D) T

Q2. 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) C (B) B (C) D (D) E

Q3. 5 : 25 :: 7 : ___

(A) 49 (B) 14 (C) 36 (D) 64

Q4. Which letter comes next? A, C, F, J, ___

(A) O (B) P (C) M (D) N

Q5. If the 18th of a month is a Friday, what day of the week is the 27th of the same month?

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

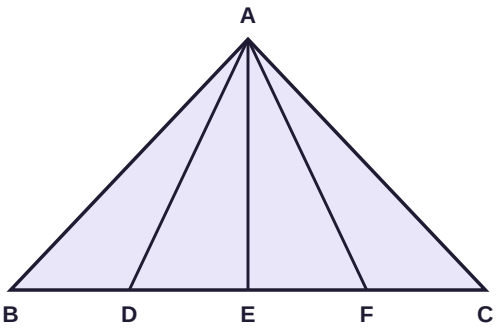
Q6. In a certain code BUS is written as FYW. How is SUN written in that code?

(A) WYR (B) RYW (C) OQJ (D) XZS

Q7. In a row of 27 children, Arjun is 7th from the left end. What is Arjun's position from the right end?

(A) 23rd (B) 21st (C) 20th (D) 22nd

Q8. How many triangles are there in the given figure?

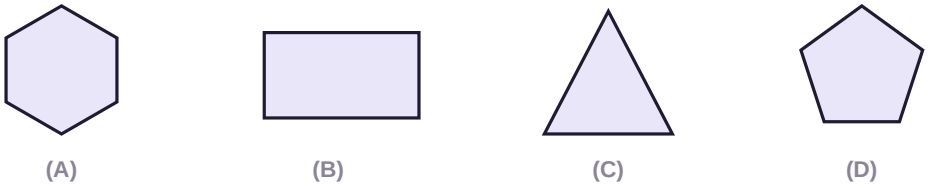


(A) 11 (B) 10 (C) 9 (D) 12

Q9. A father is 35 years older than his son. The son is 7 years old now. How old will the father be after 7 years?

(A) 42 years (B) 56 years (C) 49 years (D) 50 years

Q10. Which of these figures has exactly 2 lines of symmetry?



Q11. Find the next number in the pattern: 5, 13, 29, 61, ___

(A) 128 (B) 123 (C) 125 (D) 122

Q12. Pointing to a boy in a photograph, Anjali said, “This boy is not me, but he is the son of my paternal grandfather’s only son.” How is the boy related to Anjali?

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

Q13. Read the statements and choose the conclusion that MUST be true.
All metals conduct electricity. Copper is a metal.

(A) Copper conducts electricity. (B) Copper does not conduct electricity.

(C) Only copper is a metal. (D) All conductors are copper.

Q14. In a class, 15 students play cricket, 23 play football and 9 play both games. Every student plays at least one of the two. How many students are there in the class?

(A) 30 (B) 20 (C) 38 (D) 29

Q15. In a queue, Deep is 7th from the front and 7th from the back. How many people are in the queue altogether?

(A) 12 (B) 13 (C) 14 (D) 15

Mathematical Reasoning

20 questions · 1 mark each · 20 marks

Q16. A bag has cards numbered 1 to 20. One card is drawn. What is the probability that the number is a multiple of 3 or 5, but not both?

(A) 1/2 (B) 7/20 (C) 9/20 (D) 2/5

Q17. A 1.5 m pole casts a 2 m shadow. At the same time, a tree casts a 12 m shadow. What is the tree's height?

(A) 8 m (B) 9 m (C) 16 m (D) 10.5 m

Q18. If $\tan\theta = 3/4$ for acute θ, find $(\sin\theta + \cos\theta) \div (\sin\theta - \cos\theta)$.

(A) 7 (B) −1/7 (C) 1/7 (D) −7

Q19. On a map, A(2,3) and B(10,9) are ends of a straight road. A tea stall is ¼ of the way from A to B. What are its coordinates?

(A) (3, 3.75) (B) (4, 4.5) (C) (8, 7.5) (D) (6, 6)

Q20. A sector of radius 14 cm has perimeter 36 cm. What is its area?

(A) 44 cm^2 (B) 98 cm^2

(C) 112 cm^2 (D) 56 cm^2

Q21. At a station, three signal bells ring every 18, 24 and 30 minutes. If they ring together at 8:10 a.m., when will they next ring together?

(A) 8:16 a.m. (B) 2:10 p.m. (C) 1:10 p.m. (D) 9:22 a.m.

Q22. The zeroes of $2x^2+kx+18$ are positive, and one zero is double the other. What is k?

(A) $9\sqrt{2}$ (B) $-18\sqrt{2}$ (C) $-9\sqrt{2}$ (D) $-6\sqrt{2}$

Q23. A tailor models the length and width (m) of a rectangular cloth as the zeroes of $x^2-14x+48$. What are the dimensions?

(A) 7 m and 7 m (B) 6 m and 8 m (C) 4 m and 12 m (D) 2 m and 24 m

Q24. For $x^2 - (m + 1)x + m = 0$, the two roots differ by 3. What can m be?

(A) -4 or 2 (B) 4 or -2 (C) -4 or -2 (D) 4 or 2

Q25. Meena saves ₹150 in week 1 and increases the saving by ₹25 each week. How much does she save in 12 weeks?

(A) ₹3450 (B) ₹3150 (C) ₹3600 (D) ₹3300

Q26. For positive integers a,b, HCF(a,b)=18 and LCM(a,b)=540. Which pair could be (a,b)?

(A) (54, 180) (B) (72, 135) (C) (90, 180) (D) (36, 180)

Q27. In a school parking area, cycles and cars total 34 vehicles and 104 wheels. How many cars are parked?

(A) 20 cars (B) 26 cars (C) 16 cars (D) 18 cars

Q28. In an AP, the 5th term is 17 and the 12th term is 38. What is the sum of its first 10 terms?

(A) 155 (B) 275 (C) 215 (D) 185

Q29. Six delivery times are 18, 22, 25, 25, 30, 36 min. One more delivery of x min makes the mean 26 min and median 25 min. What is x?

(A) 30 min (B) 25 min (C) 28 min (D) 26 min

Q30. A solid cone of radius 6 cm and height 10 cm is melted into a cylinder of radius 3 cm. What is the cylinder's height?

(A) 20/3 cm (B) 40 cm (C) 10 cm (D) 40/3 cm

Q31. From a pin P outside a circular badge, two tangents PA and PB are drawn. If PA=3x+2 cm and PB=5x-6 cm, what is PA?

(A) 12 cm (B) 10 cm (C) 16 cm (D) 14 cm

Q32. If the zeroes α,β of x^2 - 5x + k satisfy $\alpha^2 + \beta^2 = 13$, what is k?

(A) 6 (B) 19 (C) 12 (D) -6

Q33. A square garden has area 50 m^2. A fence is put all around its boundary. What exact length of fence is needed?

(A) 20√2 m (B) 20 m (C) 10√2 m (D) 25√2 m

Q34. An AP has four terms, first term 7 and last term 31. What is the sum of the two middle terms?

(A) 36 (B) 46 (C) 38 (D) 40

Q35. A box has cards numbered 1 to 20. One card is drawn. What is the probability that its number is a multiple of 3 or 5, but not both?

(A) 9/20 (B) 1/2 (C) 7/20 (D) 2/5

Everyday Mathematics

10 questions · 1 mark each · 10 marks

Q36. A circular fountain of radius 7 m has a 1 m wide circular path around it. What is the path area? Use π=22/7.

(A) 22/7 m^2 (B) 330/7 m^2

(C) 44 m^2 (D) 352/7 m^2

Q37. At a canteen, 3 idlis and 2 juices cost ₹110; 2 idlis and 3 juices cost ₹115. What is the cost of one idli?

(A) ₹15 (B) ₹20 (C) ₹25 (D) ₹30

Q38. On a road map, a tea stall is at (2,3) and a pump is at (8,11). What distance is shown between them?

(A) 8 units (B) √52 units (C) 10 units (D) 14 units

Q39. A survey app gives sin θ=3/5 for an acute slope angle. What is (1 − cos θ)(1 + cos θ)?

(A) 4/5 (B) 16/25 (C) 3/5 (D) 9/25

Q40. A photo has an 18 cm by 14 cm outer frame. The uniform border area is 96 cm^2. What is the border width?

(A) 2 cm (B) 16 − 2√10 cm (C) 8 − 2√10 cm (D) 8 + 2√10 cm

Q41. A school banner is 5 m longer than it is wide and has area 84 m^2. What is its width?

(A) 14 m (B) 7 m (C) 12 m (D) 6 m

Q42. From point P outside a circular pond, two tangents PA and PB touch it. If PA=2x+3 cm and PB=5x−9 cm, what is PA?

(A) 8 cm (B) 11 cm (C) 12 cm (D) 15 cm

Q43. Maya cycles from A(1,2) to B(9,6). A snack stall is 3/4 of the way from A to B. What are its coordinates?

(A) (7,6) (B) (7,5) (C) (3,3) (D) (5,4)

Q44. A square tile has area 50 cm^2. Between which two whole-cm marks is its side length?

(A) 5 cm and 6 cm (B) 8 cm and 9 cm

(C) 6 cm and 7 cm (D) 7 cm and 8 cm

Q45. A metal cube of side 6 cm is melted and recast into smaller cubes of side 2 cm, with no loss. How many small cubes are made?

(A) 27 cubes (B) 36 cubes (C) 3 cubes (D) 9 cubes

Achievers Section

5 questions · 3 marks each · 15 marks

Q46. A card is drawn from cards numbered 1 to 30. What is the probability that the number is divisible by 3 or is a perfect square?

(A) 1/3 (B) 2/5 (C) 1/2 (D) 7/15

Q47. In a circle of radius 14 cm, chord AB subtends 60° at centre O. What is the area of the minor segment cut off by AB?

(A) $98\pi/3$ cm^2 (B) $98\pi/3 - 98\sqrt{3}$ cm^2

(C) $98\pi/3 - 49\sqrt{3}$ cm^2 (D) $49\pi/3 - 49\sqrt{3}$ cm^2

Q48. Three runners take 45 s, 50 s and 60 s to complete one lap. Starting together, when will all be at the start again, and how many laps will the fastest runner have completed?

(A) 5 min, 4 laps (B) 15 min, 20 laps

(C) 15 min, 18 laps (D) 10 min, 12 laps

Q49. A cone of radius 6 cm and height 8 cm and a cylinder of radius 4 cm and height 12 cm are melted to form one sphere. What is the sphere's radius?

(A) 5 cm (B) 6 cm (C) 8 cm (D) 4 cm

Q50. From a point on level ground, the angle of elevation of a tower is 30°. After walking 20 m towards it, the angle becomes 60°. What is the tower's height?

(A) $20\sqrt{3}$ m (B) 10 m (C) $10\sqrt{3}$ m (D) 30 m

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