School Connect Online

SCO INTERNATIONAL OLYMPIAD

GRADE 9 QUESTION PAPER

Question Paper Set A

Designed for Grade 9 mental ability reasoning, logic, pattern recognition, and analytical problem solving.

- official SCO cover style with compact question labels and clean PDF-ready spacing
- balanced reasoning coverage: coding, series, alphabet tests, puzzles, clock, calendar, cubes, images and syllogism
- answer key and explanations included after the question paper for learning and review

Maths	English	Science	Mental Ability	Finance Knowledge
AI	Entrepreneurship	GK	Coding	Life Skills

Class	Set	Total Questions	Time	Sections
9	A	50	60 minutes	Reasoning, logical analysis, non-verbal reasoning and achievers tasks

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Section A - General Mental Ability

Q1. What is the next number in the series: 3, 8, 15, 24, 35, ?

A. 46
B. 48
C. 50
D. 54

Q2. Find the missing letters in the sequence: A, F, L, S, ?, ?

A. A, J
B. Z, J
C. A, I
D. Z, I

Q3. In a certain code, each letter is replaced by its mirror letter in the alphabet and then shifted 4 positions forward. How is LOGIC coded?

A. SPXVB
B. VYRNX
C. SXPVB
D. SPXVC

Q4. If a operation b = (a + b)^2 - (a - b)^2, what is the value of 7 operation 3?

A. 80
B. 84
C. 88
D. 90

Q5. Four friends A, B, C and D are Doctor, Engineer, Lawyer and Teacher. C is the Doctor. A is not a Doctor or Lawyer. D is not an Engineer or Teacher. Who is the Engineer?

A. A
B. B
C. C
D. D

Q6. If today is Thursday, what day of the week will it be 100 days later?

A. Friday
B. Saturday
C. Sunday
D. Monday

Q7. At what approximate time between 4:00 and 5:00 will the hour and minute hands of a clock coincide?

A. 4:18

B. 4:21
C. 4:24
D. 4:27

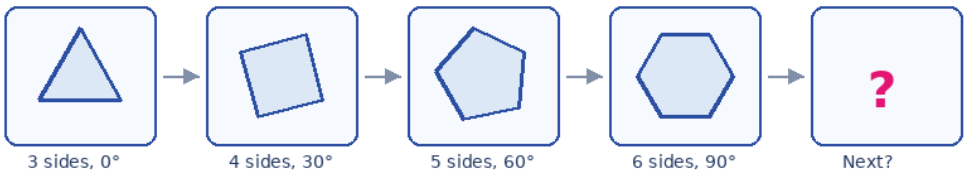
Q8. **In a row of 40 students, Ravi is 15th from the left. Asha is 10th from the right. How many students are between Ravi and Asha?**

A. 14
B. 15
C. 16
D. 17

Q9. **Consider the statements: All engineers are logical thinkers. Some logical thinkers are creative. Which conclusion must follow?**

A. All engineers are creative
B. Some engineers are creative
C. Some creative people are engineers
D. No definite conclusion can be drawn

Q10. **A non-verbal series shows polygons increasing by one side and rotating 30 degrees more at each step. What should come next?**



A. Heptagon rotated 120 degrees
B. Heptagon rotated 150 degrees
C. Octagon rotated 120 degrees
D. Octagon rotated 150 degrees

Q11. **Complete the analogy: Oxygen is to breathing as food is to _____.**

A. Nutrition
B. Transport
C. Reflection
D. Rotation

Q12. **Which number does not belong: 4, 9, 16, 25, 36, 48, 64?**

A. 9
B. 48
C. 25
D. 64

Q13. **Pointing to a boy, Arjun says, “He is the son of my father’s only son.” How is the boy related to Arjun?**

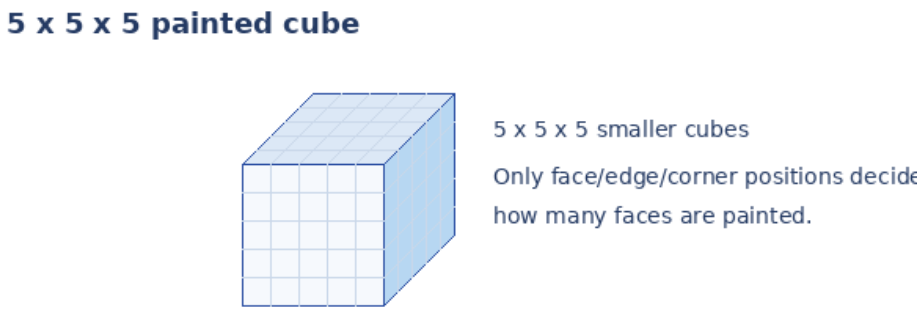
A. Brother

B. Son

C. Nephew

D. Cousin

Q14. **A cube is painted on all faces and cut into 125 equal smaller cubes. How many small cubes have exactly one face painted?**



A. 48

B. 54

C. 60

D. 64

Q15. **Determine whether x > 4. Statement 1: 2x - 3 > 5. Statement 2: x^2 > 16. Which is correct?**

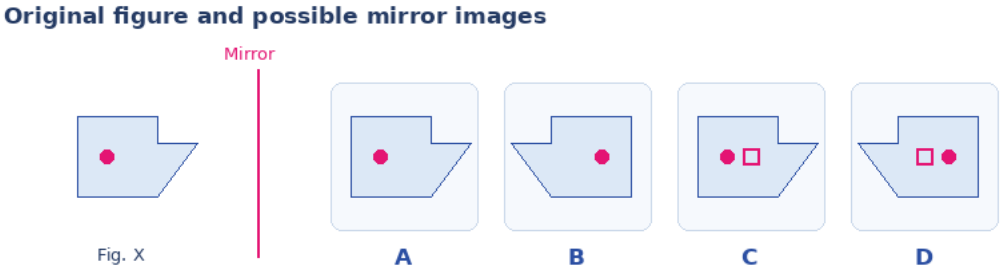
A. Statement 1 alone is sufficient, but Statement 2 alone is not

B. Statement 2 alone is sufficient, but Statement 1 alone is not

C. Both statements together are required

D. Each statement alone is sufficient

Q16. **Identify the correct mirror image of Figure X.**



A. A

B. B

C. C

D. D

Q17. **In a code, each letter is first replaced by its mirror letter and then by the next letter. How is BRAIN coded?**

A. ZJASN
B. YIZRM
C. ZJASM
D. YJAZN

Q18. **If the first half of the alphabet (A to M) is reversed while N to Z remains unchanged, what is the 11th letter from the left?**

A. E
B. D
C. C
D. B

Q19. **Reaction times are 0.863, 0.854, 0.889, 0.847, 0.876, 0.852 and 0.860 seconds. What is the second fastest time?**

A. 0.852 s
B. 0.854 s
C. 0.860 s
D. 0.863 s

Q20. **Which set is not arranged in proper increasing specificity?**

A. Organism -> Animal -> Mammal -> Dog
B. Fruit -> Citrus -> Orange -> Navel orange
C. Vehicle -> Automobile -> Sedan -> Toyota
D. Furniture -> Chair -> Recliner -> Power recliner

Section B - Analytical & Applied Reasoning

Q21. **In a code, mirror each letter and then shift consonants 2 letters forward and vowels 2 letters backward. How is CODE coded?**

A. ZNYX
B. ZMYX
C. ZNYW
D. ZNXW

Q22. **A sequence begins with 5. If a term is odd, the next term is 2n - 1; if even, add 3. What is the 5th term?**

A. 65
B. 66
C. 67
D. 68

Q23. **A letter sequence starts with B. If a letter's position is prime, shift 4 positions forward; otherwise shift 1 position forward. What is the 4th letter?**

A. K
B. L
C. J
D. I

Q24. **Define a diamond b: if a > b, use a^2 - b^2 + 5; otherwise use b^2 - a^2 - 5. What is 3 diamond 7?**

A. 35
B. 45
C. 25
D. 15

Q25. **Two ropes each burn fully in 60 minutes but not uniformly. Which method measures exactly 45 minutes?**

A. Light Rope A at both ends and Rope B at one end; when A burns out, light the other end of B
B. Light Rope A at one end and Rope B at both ends; when B burns out, 45 minutes have passed
C. Light both ropes at both ends simultaneously
D. Light Rope A at both ends, then light Rope B at one end

Q26. **In a 31-day month, if the first day is a Friday, on what date is the second Monday?**

A. 10th
B. 11th
C. 12th
D. 13th

Q27. **Five recorded times below 9.90 seconds are called fast: 9.87, 9.92, 9.85, 9.90 and 9.88. What is the average of the fast times?**

A. 9.87
B. 9.88
C. 9.89
D. 9.90

Q28. **If 4 times a number plus 6 equals 2 times the number plus 18, and the number is then doubled and increased by 4, what is the final result?**

A. 14
B. 15
C. 16
D. 18

Q29. **Statements: All successful students are diligent. All diligent students are attentive. If a student is not attentive, what must be true?**

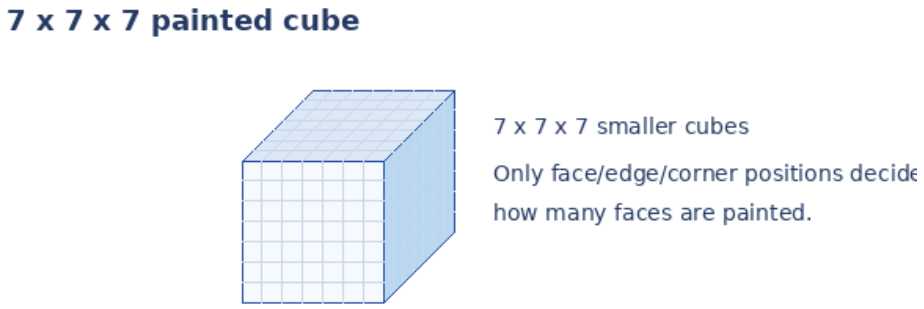
A. The student is not diligent

B. The student is not successful

C. Both A and B are true

D. Neither A nor B can be concluded

Q30. A large cube with side length 7 units is painted on all faces and cut into 1-unit cubes. How many small cubes have exactly two painted faces?



A. 50

B. 55

C. 60

D. 65

Section C - Case Study / Data / Visual Reasoning

Q31. Find the next term in the series: 7, 12, 20, 31, ?

A. 43

B. 45

C. 47

D. 49

Q32. Find the next two letters in the sequence: C, G, L, R, ?, ?

A. Y, G

B. Z, H

C. X, F

D. Y, H

Q33. If 3 times a number increased by 5 equals 2 times the number decreased by 4, what is the number?

A. -9

B. -4

C. 4

D. 9

Q34. **If December 1, 2022 was a Thursday, what day of the week was March 15, 2023?**

A. Monday
B. Tuesday
C. Wednesday
D. Thursday

Q35. **Arrange 0.742, 0.725, 0.728, 0.735, 0.731 in descending order. Which is the third largest?**

A. 0.735
B. 0.731
C. 0.728
D. 0.725

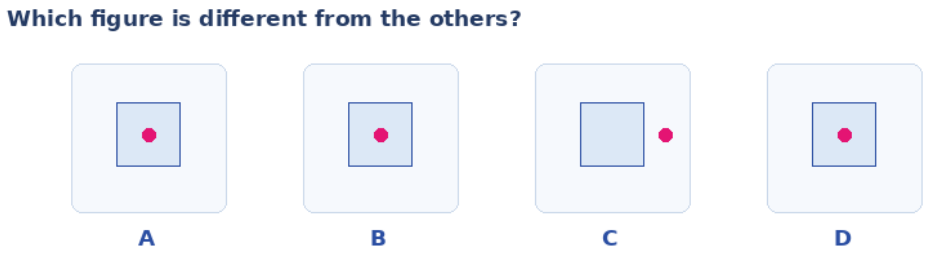
Q36. **A committee has P, Q, R, S and T. P sits immediately left of R, T sits immediately right of S, and Q is between R and T in a row. Which arrangement is possible from left to right?**

A. P R Q T S
B. S T Q R P
C. P R Q S T
D. R P Q S T

Q37. **A table shows scores: A=72, B=87, C=81, D=87, E=76. If ranks are given with equal scores sharing the same rank, what is C's rank?**

A. 2nd
B. 3rd
C. 4th
D. 5th

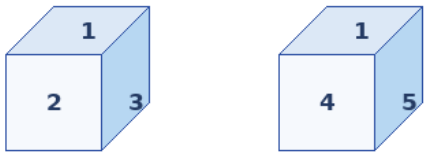
Q38. **Which figure is different from the others?**



A. A
B. B
C. C
D. D

Q39. **A dice is shown in two views with 1 on the top. In one view, 2 and 3 are adjacent to 1. In another view, 4 and 5 are adjacent to 1. Which face is opposite to 1?**

Dice views for reasoning



If 1 is on top in both views, opposite faces can be inferred from the adjacent positions.

A. 2
B. 3
C. 4
D. 6

Q40. **Let x and y be real numbers. Determine whether x > 2y. Statement 1: x - y > y + 3. Statement 2: x + y < 4y + 6. Which is correct?**

A. Statement 1 alone is sufficient, Statement 2 alone is not
B. Statement 2 alone is sufficient, Statement 1 alone is not
C. Both together are required
D. Each statement alone is sufficient

Section D - Achievers Section

Q41. **Case Study: In a quiz, Ana, Bala, Charu and Dev score 82, 76, 82 and 91. If equal scores share a rank, what is Bala's rank?**

A. 2nd
B. 3rd
C. 4th
D. 5th

Q42. **Achievers: A sequence starts with B. If the current letter position is prime, move 4 letters forward; otherwise move 3 letters forward. What is the 5th letter?**

A. M
B. N
C. O
D. P

Q43. **Achievers: A cube is painted on all faces and cut into 216 equal cubes. How many small cubes have no painted face?**

A. 64
B. 80

C. 96
D. 100

Q44. Achievers: In a code, 1 star = 3 points and 1 circle = 5 points. A pattern has 4 stars and 3 circles. If 2 points are deducted, what is the final score?

A. 23
B. 25
C. 27
D. 29

Q45. Achievers: Three tasks A, B and C must be scheduled. A must be before C. B cannot be first. Which order is valid?

A. B A C
B. C A B
C. A C B
D. B C A

Q46. Achievers: The angle between clock hands at 3:30 is closest to which value?

A. 60 degrees
B. 75 degrees
C. 90 degrees
D. 105 degrees

Q47. Achievers: Meera says, "The girl in the photo is the daughter of my father's only daughter." How is the girl related to Meera?

A. Sister
B. Daughter
C. Niece
D. Cousin

Q48. Achievers: Statements: All squares are rectangles. No rectangle is a circle. Which conclusion follows?

A. No square is a circle
B. Some circles are squares
C. All circles are squares
D. No conclusion follows

Q49. Achievers: Is n even? Statement 1: n is divisible by 4. Statement 2: n is divisible by 2. Which is correct?

A. Statement 1 alone is sufficient, but Statement 2 alone is not
B. Statement 2 alone is sufficient, but Statement 1 alone is not
C. Both together are required
D. Each statement alone is sufficient

Q50. Achievers: A figure sequence alternates triangle, square, triangle, square while the shaded region moves clockwise. What is the best strategy to solve it?

A. Check only the number of sides

B. Check both shape alternation and shading movement

C. Ignore the shaded region

D. Choose the largest figure

Space for Rough Work

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Answer Key

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

Explanations

Q1. Answer B: The differences are 5, 7, 9 and 11. The next difference is 13, so 35 + 13 = 48.

Q2. Answer A: Alphabet positions are 1, 6, 12, 19. The gaps are +5, +6, +7. Next gaps are +8 and +9: 19 + 8 = 27, which wraps to A, and A + 9 gives J.

Q3. Answer A: Mirror letters are L->O, O->L, G->T, I->R, C->X. Shifting each 4 positions forward gives S, P, X, V, B.

Q4. Answer B: Using the identity (a+b)^2 - (a-b)^2 = 4ab. Therefore, 4 x 7 x 3 = 84.

Q5. Answer A: C is Doctor. D cannot be Engineer or Teacher and cannot be Doctor, so D is Lawyer. A is not Doctor/Lawyer, so A must be Engineer. B is Teacher.

Q6. Answer B: 100 divided by 7 leaves a remainder of 2. Two days after Thursday is Saturday.

Q7. Answer B: The hands coincide at 60H/11 minutes after H o'clock. For H = 4, time = 240/11 = 21.82 minutes, about 4:21:49.

Q8. Answer B: Asha is 40 - 10 + 1 = 31st from the left. Students between them = 31 - 15 - 1 = 15.

Q9. Answer D: The statements do not prove that the creative logical thinkers are engineers. No definite engineer-creative overlap is guaranteed.

Q10. Answer A: The number of sides increases from 3 to 4 to 5 to 6, so the next is 7 sides. Rotation goes 0, 30, 60, 90, so the next is 120 degrees.

Q11. Answer A: Oxygen supports breathing; food supports nutrition and energy needs.

Q12. Answer B: All numbers except 48 are perfect squares: 2^2, 3^2, 4^2, 5^2, 6^2 and 8^2.

Q13. Answer B: Arjun's father's only son is Arjun himself. The son of Arjun is Arjun's son.

Q14. Answer B: 125 = 5^3, so the cube is 5 x 5 x 5. Cubes with exactly one painted face are inner face cubes: 6 x (5 - 2)^2 = 6 x 9 = 54.

Q15. Answer A: Statement 1 gives 2x > 8, so x > 4. Statement 2 gives x > 4 or x < -4, so it is not sufficient alone.

Q16. Answer B: In a vertical mirror image, left and right positions reverse while top and bottom remain the same. Option B preserves the shape and reverses the dot position correctly.

Q17. Answer A: Mirror letters are B->Y, R->I, A->Z, I->R, N->M. The next letters are Z, J, A, S, N.

Q18. Answer C: The first half becomes M, L, K, J, I, H, G, F, E, D, C, B, A. The 11th letter is C.

Q19. Answer A: Fastest means the smallest time. Ordered ascending: 0.847, 0.852, 0.854, 0.860, 0.863, 0.876, 0.889. The second fastest is 0.852 s.

Q20. Answer C: Toyota is a brand name, not a type that is more specific than sedan. The other chains move from broad category to more specific type.

Q21. Answer A: C->X->Z, O->L->N, D->W->Y, E->V->X. Therefore CODE becomes ZNYX.

Q22. Answer A: 5 is odd: 5->9->17->33->65. The 5th term is 65.

Q23. Answer A: B is position 2, prime, so B->F. F is 6, not prime, so F->G. G is 7, prime, so G->K. The 4th letter is K.

Q24. Answer A: Since 3 <= 7, use 7^2 - 3^2 - 5 = 49 - 9 - 5 = 35.

Q25. Answer A: Rope A burning from both ends takes 30 minutes. Rope B has 30 minutes of burn time left. Lighting its other end makes the remaining part burn in 15 minutes. Total = 45 minutes.

Q26. Answer B: Day 1 is Friday, so the first Monday is day 4. The second Monday is 7 days later, day 11.

Q27. Answer A: Fast times are 9.87, 9.85 and 9.88. Their average is 29.60 / 3 = 9.866..., approximately 9.87.

Q28. Answer C: 4x + 6 = 2x + 18 gives 2x = 12, so x = 6. Doubling and adding 4 gives 2 x 6 + 4 = 16.

Q29. Answer C: By contrapositive, not attentive implies not diligent. If the student is not diligent, the student cannot be successful under the given chain.

Q30. Answer C: Cubes with exactly two painted faces lie on edges but not corners. The count is 12 x (7 - 2) = 60.

Q31. Answer B: Differences are 5, 8 and 11. The gaps increase by 3, so the next gap is 14. Therefore, 31 + 14 = 45.

Q32. Answer A: Positions are 3, 7, 12, 18 with differences +4, +5, +6. Next are +7 and +8: 25 = Y and 33 wraps to 7 = G.

Q33. Answer A: Let the number be x. 3x + 5 = 2x - 4, so x = -9.

Q34. Answer C: Days after Dec 1 to Mar 15: 30 + 31 + 28 + 15 = 104. 104 mod 7 = 6. Six days after Thursday is Wednesday.

Q35. Answer B: Descending order is 0.742, 0.735, 0.731, 0.728, 0.725. The third largest is 0.731.

Q36. Answer C: P must be immediately left of R, so P R must appear. T immediately right of S means S T. Q between R and T is satisfied in P R Q S T.

Q37. Answer B: B and D share rank 1 with 87. C has the next lower score, so C is rank 3 under competition ranking.

Q38. Answer C: In A, B and D the dot is inside the diamond. In C the dot is placed outside the diamond, so it is the odd one out.

Q39. Answer D: If 1 is adjacent to 2, 3, 4 and 5, the only remaining numbered face is 6. Hence 6 is opposite to 1.

Q40. Answer A: Statement 1 gives x > 2y + 3, so x > 2y. Statement 2 gives only x < 3y + 6, which is not enough to prove x > 2y.

Q41. Answer C: Dev is rank 1. Ana and Charu share rank 2. Bala has the next lower score, so Bala is rank 4.

Q42. Answer C: B is position 2, a prime, so B->F. F is 6, not prime, so F->I. I is 9, not prime, so I->L. L is 12, not prime, so L->O. The 5th letter is O.

Q43. Answer A: 216 = 6^3, so n=6. Unpainted cubes are fully inside: (6 - 2)^3 = 4^3 = 64.

Q44. Answer B: 4 stars give 4 x 3 = 12 points and 3 circles give 3 x 5 = 15 points. Total 27, after deducting 2 gives 25.

Q45. Answer C: A must come before C, and B cannot be first. A C B satisfies both conditions.

Q46. Answer B: At 3:30 the minute hand is at 180 degrees. The hour hand is at 3.5 x 30 = 105 degrees. Difference = 75 degrees.

Q47. Answer B: Meera's father's only daughter is Meera herself. The daughter of Meera is Meera's daughter.

Q48. Answer A: If every square is a rectangle and no rectangle is a circle, then no square can be a circle.

Q49. Answer D: A number divisible by 4 is even, and a number divisible by 2 is also even. Each statement alone is sufficient.

Q50. Answer B: A two-rule non-verbal series must be solved by tracking both rules: the shape alternation and the clockwise movement of the shaded region.