

# SCO INTERNATIONAL OLYMPIAD

## GRADE 6

## MENTAL ABILITY OLYMPIAD

Official Question Paper 2025-26 | Answer Key and Explanations

**Designed from Grade 6 reasoning pathways and aligned with SCO's platform flow for guided preparation, practice, reporting, and future-ready academic growth.**

- age-fit logical reasoning guidance for Grade 6 / middle-school learners globally
- chapter-wise pathways across series, coding-decoding, puzzles, calendar, ranking, cubes, verbal reasoning, and arithmetic reasoning
- clean academic layout with compact question labels, answer key, and learning explanations for PDF-ready publishing

Series	Coding	Alphabet	Puzzles	Ranking
Reasoning	Blood Relations	Cubes & Dices	Verbal	SCO Skills

### 2025-26 | Class 6 | Question Paper Set A

Total Questions	Time	Sections	Marking
50	60 minutes	General, Case Study, Reason/Assertion, Achievers	Achievers questions carry 2 marks; all other questions carry 1 mark

### Guidelines for the Candidate

- Do not open the booklet until instructed.
- Fill your name, registration ID, school details, and contact number on the OMR sheet before starting.
- There is only one correct answer for each question. Select one option only.
- No calculator is allowed. Use rough space for working.
- All passages, tables, and figures needed for a question are placed inside the relevant question block.

## General Mental Ability

**Q1.** Find the missing number in the series: 3, 6, 10, 15, 21, ?.

**3 6 10 15 21 ?**

Look at the differences between consecutive terms.

A) 26

B) 27

C) 28

D) 29

**Answer: C) 28**

**Explanation:** The differences are 3, 4, 5, and 6. The next difference is 7, so  $21 + 7 = 28$ .

**Q2.** In a code language, each letter is first replaced by its mirror letter (A $\leftrightarrow$ Z, B $\leftrightarrow$ Y, etc.) and then shifted 1 position forward. What is the coded form of BIRD?

A) ZSJX

B) CJSF

C) CJSE

D) YRIW

**Answer: A) ZSJX**

**Explanation:** B mirrors to Y and shifts to Z; I mirrors to R and shifts to S; R mirrors to I and shifts to J; D mirrors to W and shifts to X.

**Q3.** Which letter comes next in the sequence: A, D, H, M, ?

A) R

B) S

C) T

D) U

**Answer: B) S**

**Explanation:** Alphabet positions are 1, 4, 8, 13. The differences are +3, +4, +5, so the next difference is +6.  $13 + 6 = 19$ , which is S.

**Q4.** Define the operation Delta as  $a \text{ Delta } b = (a + 2b) - (b + 2a)$ . What is  $7 \text{ Delta } 5$ ?

A) -2

B) 0

C) 2

D) 4

**Answer: A) -2**

**Explanation:**  $7 \text{ Delta } 5 = (7 + 10) - (5 + 14) = 17 - 19 = -2$ .

**Q5.** A bag contains red, blue, and green marbles. Red marbles equal blue marbles, and green marbles are 8 more than red marbles. If there are 44 marbles, how many blue marbles are there?

- A) 10  
C) 12

- B) 11  
D) 13

**Answer: C) 12**

**Explanation:** Let red = blue =  $x$  and green =  $x + 8$ . Then  $x + x + (x + 8) = 44$ , so  $3x = 36$  and  $x = 12$ .

**Q6.** If January 1, 2024 (a leap year) is a Monday, what day of the week is February 15, 2024?

January 1 is Monday

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1						
						15

- A) Tuesday  
C) Thursday

- B) Wednesday  
D) Friday

**Answer: C) Thursday**

**Explanation:** From January 1 to February 15 is 45 days later. Since  $45 \bmod 7 = 3$ , Monday advances by 3 days to Thursday.

**Q7.** In a race of 50 runners, if a runner is ranked 12th from the top, what is his rank from the bottom?

Rank from top + rank from bottom = total + 1



- A) 38th  
C) 40th

- B) 39th  
D) 41st

**Answer: B) 39th**

**Explanation:** Rank from bottom = total - top rank + 1 =  $50 - 12 + 1 = 39$ .

**Q8.** If 4 times a number plus 6 equals 3 times the number plus 10, what is the number?

- A) 2  
C) 4

- B) 3  
D) 5

**Answer: C) 4**

**Explanation:** Let the number be  $x$ .  $4x + 6 = 3x + 10$ , so  $x = 4$ .

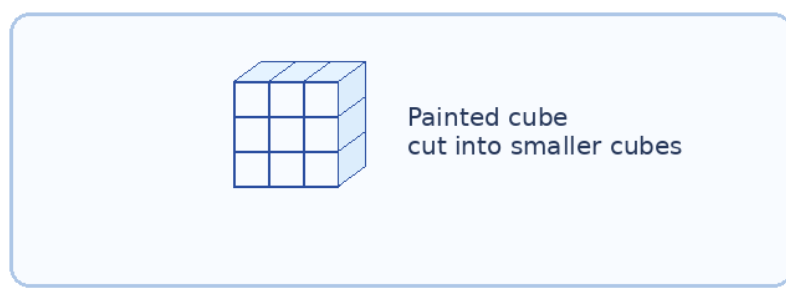
**Q9.** In a family, R is the sister of S and S is the mother of T. How is R related to T?

A) Aunt	B) Cousin
C) Sister	D) Niece

**Answer: A) Aunt**

**Explanation:** R is the sister of T's mother, so R is T's aunt.

**Q10.** A cube is painted on all faces and then cut into 27 smaller cubes ( $3 \times 3 \times 3$ ). How many smaller cubes have exactly two faces painted?



A) 6	B) 8
C) 12	D) 18

**Answer: C) 12**

**Explanation:** Exactly two painted faces occur on edge cubes excluding corners. In a  $3 \times 3 \times 3$  cube, each of 12 edges has 1 such cube, so total = 12.

**Q11.** Find the next number in the series: 2, 5, 11, 23, 47, ?.

A) 87	B) 91
C) 95	D) 99

**Answer: C) 95**

**Explanation:** Each term is obtained by multiplying the previous term by 2 and adding 1:  $47 \times 2 + 1 = 95$ .

**Q12.** In a special code, each letter is replaced by the letter 3 positions ahead of its mirror letter, and then the whole string is reversed. What is the code for GAME?

A) YQCW	B) WCQY
C) QWYC	D) WYQC

**Answer: A) YQCW**

**Explanation:** G→T→W, A→Z→C, M→N→Q, E→V→Y. This gives WCQY; reversing it gives YQCW.

**Q13.** A letter series is formed by taking a letter's position, adding the sum of its digits, and converting back to a letter. Starting with C, what is the 4th letter?

A) I	B) L
C) O	D) Q

**Answer: C) O**

**Explanation:** C=3, so next is 6 (F). F=6 gives 12 (L). L=12, digit sum 3, so  $12+3=15$ , which is O.

**Q14.** Define an operation  $x \text{ otimes } y = 2(x + y)$ . Compute  $9 \text{ otimes } 4$ .

A) 22	B) 24
C) 26	D) 28

**Answer: C) 26**

**Explanation:**  $9 \text{ otimes } 4 = 2(9 + 4) = 2 \times 13 = 26$ .

**Q15.** A jar has red, blue, and green candies. Red candies are 3 more than blue candies, and green candies are 2 less than blue candies. If there are 40 candies, how many red candies are there?

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

**Answer: D) 16**

**Explanation:** Let blue =  $x$ . Then red =  $x+3$  and green =  $x-2$ . Total =  $x + x+3 + x-2 = 3x+1 = 40$ , so  $x=13$  and red=16.

**Q16.** In a common year, if March 1 is a Wednesday, what day of the week is November 15?

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

**Answer: B) Tuesday**

**Explanation:** From March 1 to November 15 is 258 days later. Since  $258 \bmod 7 = 6$ , Wednesday advances 6 days to Tuesday.

**Q17.** In a class of 80 students, if a student ranks 17th from the top, what is his rank from the bottom?

A) 64th	B) 63rd
C) 62nd	D) 65th

**Answer: A) 64th**

**Explanation:** Rank from bottom =  $80 - 17 + 1 = 64$ .

**Q18.** If  $2(x + 4) = 3(x - 2) - 5$ , what is the value of  $x$ ?

A) 15	B) 17
C) 19	D) 21

**Answer: C) 19**

**Explanation:**  $2x + 8 = 3x - 6 - 5 = 3x - 11$ . Therefore  $x = 19$ .

**Q19.** P is the brother of Q. Q is the mother of R. How is P related to R?

- |           |                |
|-----------|----------------|
| A) Father | B) Uncle       |
| C) Cousin | D) Grandfather |

**Answer: B) Uncle**

**Explanation:** P is the brother of R's mother, so he is R's maternal uncle.

**Q20.** A cube is painted on all faces and cut into 64 smaller cubes ( $4 \times 4 \times 4$ ). How many smaller cubes have exactly two painted faces?

- |       |       |
|-------|-------|
| A) 12 | B) 16 |
| C) 20 | D) 24 |

**Answer: D) 24**

**Explanation:** For an  $n \times n \times n$  cube, exactly two painted faces =  $12(n - 2)$ . Here  $n=4$ , so  $12 \times 2 = 24$ .

## Case Study Based Questions

**Q21.** Case Study: A school club's new members are 20 in January. The monthly increase starts at 5 and grows by 2 each month. In May, only half the predicted new members join. What is the total from January to May?

- |        |        |
|--------|--------|
| A) 138 | B) 144 |
| C) 150 | D) 156 |

**Answer: B) 144**

**Explanation:** Monthly counts are 20, 25, 32, 41, and predicted May 52. Half of May is 26. Total =  $20 + 25 + 32 + 41 + 26 = 144$ .

**Q22.** Case Study: A company code takes the first two letters, replaces them by mirror letters, shifts forward by launch month number, and appends the third term of 5, 8, 11, .... Product WISH is launched in April. What is its code?

- |         |         |
|---------|---------|
| A) HV8  | B) HV11 |
| C) IV11 | D) IV8  |

**Answer: B) HV11**

**Explanation:** WI mirrors to DR. April means shift forward by 4, so  $D \rightarrow H$  and  $R \rightarrow V$ . The third term is 11, so the code is HV11.

**Q23.** Case Study: A school bus departs at 7:20 AM and normally takes 40 minutes. On a rainy day it departs 5 minutes late and travel time increases by 25%. What is the new arrival time?

- |            |            |
|------------|------------|
| A) 8:05 AM | B) 8:10 AM |
|------------|------------|

C) 8:15 AM

D) 8:20 AM

**Answer: C) 8:15 AM**

**Explanation:** Rainy departure = 7:25 AM. Travel time =  $40 \times 1.25 = 50$  minutes. Arrival = 8:15 AM.

**Q24.** Case Study: A store's monthly revenue increases by 25% of the previous month. If Month 1 revenue is \$400, what is Month 3 revenue?

A) \$500

B) \$625

C) \$750

D) \$800

**Answer: B) \$625**

**Explanation:** Month 2 =  $400 \times 1.25 = 500$ . Month 3 =  $500 \times 1.25 = 625$ .

**Q25.** Case Study: Books are sorted by increasing page count and then by author surname if page counts tie: X(300, King), Y(250, Adams), Z(300, Brown), W(250, Carter). Which book is third?

A) Book Y

B) Book W

C) Book Z

D) Book X

**Answer: C) Book Z**

**Explanation:** The order is Y (250, Adams), W (250, Carter), Z (300, Brown), X (300, King). Thus, the third book is Z.

**Q26.** Case Study: Ticket prices are \$10, \$11, \$12, ... for each successive ticket. If more than 5 tickets are bought, a discount equal to the number of tickets is applied. What is the cost for 7 tickets?

A) \$84

B) \$86

C) \$88

D) \$90

**Answer: A) \$84**

**Explanation:** The seven prices sum to  $10+11+12+13+14+15+16 = 91$ . Discount = 7 dollars, so total = 84.

**Q27.** Case Study: A tutoring center starts at 4:30 PM. Each class lasts 45 minutes, followed by a 15-minute break. It closes at 8:00 PM. How many full classes can be scheduled?

A) 3

B) 4

C) 5

D) 6

**Answer: A) 3**

**Explanation:** Classes can run 4:30-5:15, 5:30-6:15, and 6:30-7:15. A fourth class from 7:30 to 8:15 would exceed 8:00 PM.

**Q28.** Case Study: A fruit basket has apples, oranges, and bananas. Apples are twice oranges, and bananas are 3 fewer than oranges. If there are 29 fruits, how many apples are there?

A) 14

B) 15

C) 16

D) 17

**Answer: C) 16**

**Explanation:** Let oranges =  $x$ . Then apples =  $2x$  and bananas =  $x - 3$ . Total =  $2x + x + (x - 3) = 29$ , so  $4x=32$ ,  $x=8$ , and apples = 16.

**Q29.** Case Study: In a 50-runner race, a runner finishes 13th. If the 12th and 13th runners differ by less than 0.05 seconds and are treated as tied, what rank do both share?

A) 12th

B) 13th

C) 14th

D) 15th

**Answer: A) 12th**

**Explanation:** When two competitors tie, both receive the better shared position. The 12th and 13th runners therefore share 12th rank.

**Q30.** Case Study: A bookstore's total revenue over two days is \$500. Day 2 revenue is \$60 more than Day 1. What is Day 2 revenue?

A) \$260

B) \$270

C) \$280

D) \$290

**Answer: C) \$280**

**Explanation:** Let Day 1 =  $x$ . Then Day 2 =  $x+60$  and  $2x+60=500$ . So  $x=220$  and Day 2 = 280.

## Reason and Assertion

Use the options given in each question to judge whether the Assertion and Reason are true and whether the Reason correctly explains the Assertion.

**Q31.** Assertion: In a series where each term is made by doubling the previous term and adding 1, starting from an odd number, every term is odd. Reason: Doubling any number gives an even number, and adding 1 gives an odd number.

A) Both true; Reason explains Assertion

B) Both true; Reason does not explain Assertion

C) Assertion true; Reason false

D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Starting from an odd number, double is even and adding 1 makes the next term odd. The same reasoning repeats for every term.

**Q32.** Assertion: In mirror-letter coding (A $\leftrightarrow$ Z, B $\leftrightarrow$ Y), every vowel becomes a consonant. Reason: A, E, I, O, U mirror to Z, V, R, L, F respectively.

A) Both true; Reason explains Assertion

B) Both true; Reason does not explain Assertion

C) Assertion true; Reason false

D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** The mirror letters of all five vowels are consonants, so the reason directly proves the assertion.

**Q33.** Assertion: If the first day of a 31-day month is Wednesday, the last day will be Friday. Reason: There are 30 days after the first day, and  $30 \bmod 7 = 2$ .

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Advancing two weekdays from Wednesday gives Friday, so the reason correctly explains the assertion.

**Q34.** Assertion: When a cube painted on all faces is divided into  $n^3$  smaller cubes, the number of cubes with no painted face is  $(n-2)^3$ . Reason: Only interior cubes remain unpainted after the outer layer is removed.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** The unpainted cubes form an inner cube of side  $n-2$ , giving  $(n-2)^3$  cubes.

**Q35.** Assertion: A student scoring 69 gets neither bonus nor penalty if bonus starts above 70 and penalty applies below 50. Reason: 69 is between 50 and 70.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Since 69 is not above 70 and not below 50, neither condition applies.

**Q36.** Assertion: In a class of 40 students, rank 10th from the top means rank 31st from the bottom. Reason: Bottom rank = total - top rank + 1.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:**  $40 - 10 + 1 = 31$ , so the reasoning is correct.

**Q37.** Assertion: If a rope burns completely in 60 minutes but unevenly, lighting it from both ends makes it burn out in 30 minutes. Reason: Burning from both ends consumes the rope at twice the overall rate.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Even if burning is irregular along the rope, lighting both ends guarantees the two burn fronts together consume the whole rope in half the total time.

**Q38.** Assertion: In the series 2, 4, 8, 16, 32, each term is a power of 2. Reason: Each term is obtained by multiplying the previous term by 2.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Repeated multiplication by 2 generates powers of 2.

**Q39.** Assertion: If X is the sister of Y and Y is the mother of Z, then X is the aunt of Z. Reason: A person's sibling is aunt/uncle to that person's child.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** X is the sister of Z's mother, so X is Z's aunt.

**Q40.** Assertion: A conclusion validly deduced from true premises must be true. Reason: Deductive reasoning preserves truth when the form of reasoning is valid.

A) Both true; Reason explains Assertion	B) Both true; Reason does not explain Assertion
C) Assertion true; Reason false	D) Both false

**Answer: A) Both true; Reason explains Assertion**

**Explanation:** Valid deductive reasoning cannot lead from true premises to a false conclusion.

## Achievers Section

**Q41.** Achievers: Science fair IDs follow 101, then add primes 2, 3, 5, .... A student named Alex receives ID 111. His code uses first two letters, mirror letters, then shift one forward; append weekday for Sept 15, 2025 if Jan 1, 2025 is Wednesday. What is the code?

A) 4-AP-Mon	B) 4-AP-Tue
C) 5-AP-Mon	D) 5-AP-Tue

**Answer: A) 4-AP-Mon**

**Explanation:** IDs are 101, 103, 106, 111, so position is 4. AL mirrors to ZO, shifting forward gives AP. Sept 15, 2025 is Monday, so the code is 4-AP-Mon.

**Q42.** Achievers: A bus normally departs at 7:10 AM and takes 35 minutes. On a rainy day it departs 7 minutes late and travel time increases by 30%. Seats are 10, 12, 15, 20, ... What is Mia's seat position for seat 20 and arrival time?

- |                      |                      |
|----------------------|----------------------|
| A) 4th seat; 8:03 AM | B) 4th seat; 8:05 AM |
| C) 5th seat; 8:03 AM | D) 5th seat; 8:05 AM |

**Answer: A) 4th seat; 8:03 AM**

**Explanation:** Seat series: 10, 12, 15, 20, so seat 20 is 4th. Rainy departure is 7:17; travel time is  $35 \times 1.30 = 45.5$  minutes, about 8:03 AM.

**Q43.** Achievers: Books are sorted by increasing page count and then author surname: A(300, King), B(250, Adams), C(300, Brown), D(250, Carter), E(210, Daniels). Which book is third?

- |           |           |
|-----------|-----------|
| A) Book E | B) Book B |
| C) Book D | D) Book C |

**Answer: C) Book D**

**Explanation:** Order is E (210), B (250 Adams), D (250 Carter), C (300 Brown), A (300 King). The third book is D.

**Q44.** Achievers: A charity donation pattern starts at \$20. The first increase is \$7 and each next increase is \$5 more. What is the total of the first 5 donations?

- |          |          |
|----------|----------|
| A) \$210 | B) \$220 |
| C) \$230 | D) \$240 |

**Answer: B) \$220**

**Explanation:** Donations are 20, 27, 39, 56, 78. Their total is 220.

**Q45.** Achievers: A center starts meetings at 4:30 PM. First meeting lasts 40 minutes, each next lasts 5 minutes longer, and each break is 10 minutes. It closes at 8:00 PM. How many complete meetings can be held, and when does the last start?

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| A) 3 meetings; last starts at 6:15 PM | B) 3 meetings; last starts at 6:30 PM |
| C) 4 meetings; last starts at 6:15 PM | D) 4 meetings; last starts at 6:30 PM |

**Answer: A) 3 meetings; last starts at 6:15 PM**

**Explanation:** Meetings are 4:30-5:10, 5:20-6:05, and 6:15-7:05. The next would start 7:15 and end after 8:00, so only 3 fit.

**Q46.** Achievers: Candidates X, Y, Z score 88 urban, 88 rural, 85 rural. Rural applicants get +2 points. Who is ranked second after bonus?

- |                |                |
|----------------|----------------|
| A) Candidate X | B) Candidate Y |
| C) Candidate Z | D) Tie         |

**Answer: A) Candidate X**

**Explanation:** Final scores are X=88, Y=90, Z=87. Ranking is Y first, X second, Z third.

**Q47. Achievers:** A train normally takes 120 minutes. Today it departs 10 minutes late and travel time increases by 20%. If the student usually arrives 5 minutes early, by how many minutes is the student delayed relative to his usual early arrival?

A) 35 min	B) 37 min
C) 39 min	D) 41 min

**Answer: C) 39 min**

**Explanation:** Travel increases by 24 minutes and departure is 10 minutes late, so arrival is 34 minutes later than scheduled. Compared with a usual 5-minute-early arrival, delay is  $34 + 5 = 39$  minutes.

**Q48. Achievers:** A gadget has base price \$100. For feature level 5, add the first five prime numbers: 2, 3, 5, 7, 11. What is the price?

A) \$124	B) \$126
C) \$128	D) \$130

**Answer: C) \$128**

**Explanation:** Sum of first five primes =  $2+3+5+7+11 = 28$ . Price =  $100 + 28 = 128$ .

**Q49. Achievers:** A cube of side 8 small units is painted on all faces and cut into  $8^3$  smaller cubes. Let F be cubes with exactly one painted face and G with exactly two painted faces. Find  $F - G$ .

A) 136	B) 140
C) 144	D) 148

**Answer: C) 144**

**Explanation:**  $F = 6(n-2)^2 = 6 \times 36 = 216$ .  $G = 12(n-2) = 72$ . Thus  $F - G = 144$ .

**Q50. Achievers:** A bookstore reports \$500 revenue over two days, and Day 2 was \$60 more than Day 1. What was Day 2 revenue?

A) \$260	B) \$270
C) \$280	D) \$290

**Answer: C) \$280**

**Explanation:** Let Day 1 be  $x$ . Then Day 2 =  $x+60$  and  $2x+60 = 500$ . So  $x = 220$  and Day 2 = 280.

## Answer Key

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
C	A	B	A	C	C	B	C	A	C
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
C	A	C	C	D	B	A	C	B	D

Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	C	B	C	A	A	C	A	C
Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
A	A	A	A	A	A	A	A	A	A
Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50
A	A	C	B	A	A	C	C	C	C