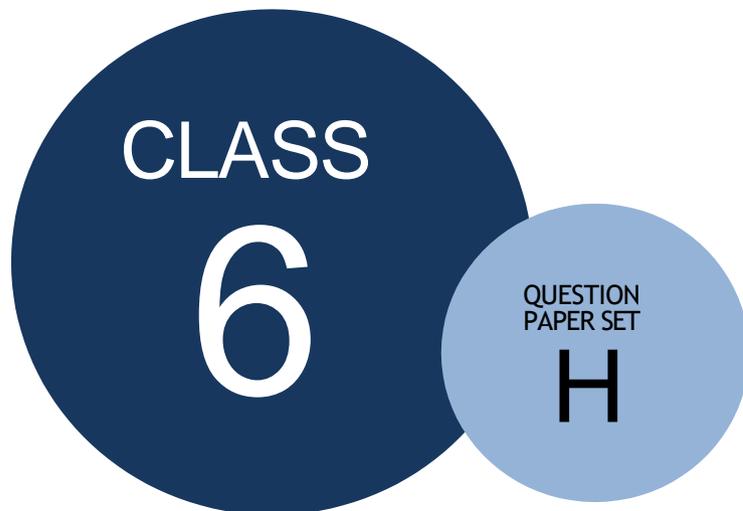


SCO INTERNATIONAL MATH  
OLYMPIAD 2023-24



DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Guidelines for the Candidate

1. Before the exam begins, you will have an additional 20 minutes to complete the OMR Sheet with personal information.
2. On the OMR Sheet, clearly write your name, **school code, class, roll number, and mobile number..**
3. Four sections make up the question paper:

**General Math ,Reason/Assertion ,Case Study and Achievers Section** (5 Questions).

**Total Questions - 50**

4. Every inquiry must be answered. There are no failing grades. Calculator use is not allowed.
5. There is just ONE right response. Select ONE response choice only.
6. Use only an HB pencil or a blue or black ballpoint pen to indicate your choice of responses by darkening the corresponding circles on the OMR Sheet. E.g.

**Q.1: What is the capital of India?**

- A. Kolkata B. Mumbai C. Delhi D. Chennai

You must shade the circle next to option C on the OMR Sheet since that is the right response.



7. At the conclusion of the test, hand over the OMR Sheet to the Invigilator.
8. Before attempting the paper, kindly provide your personal information in the box provided on this page. .



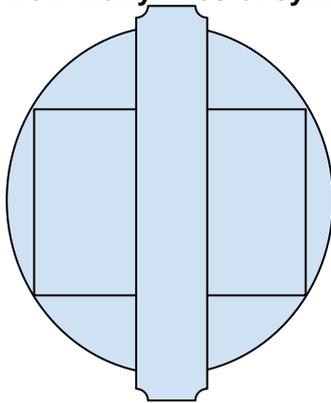
Name:.....

Registration ID:..... Contact No.:.....

1.	<p>Rahul loves to finish his work using the pomodoro technique where each session is of 25 min and he takes a break for sometime after each session of pomodoro. If he types 20 words/min. Then calculate the total number of words he can type in five pomodoro sessions.</p> <p>a) 450                      b) 420                      c) 5000                      d) 500</p>
2.	<p><b>Fill in the blanks:</b></p> <p>i) A quadrilateral whose sum of opposite angles is 180 degrees and is concyclic is a _____ quadrilateral.</p> <p>ii) A quadrilateral whose one pair of opposite sides are parallel and other two pairs are equal then the quadrilateral is _____.</p> <p>iii) A parallelogram whose all sides are equal and diagonals intersect perpendicularly is _____.</p> <p>a) Cyclic, trapezium, rectangle                      b) Cyclic, trapezium, rhombus c) Cyclic, isosceles trapezium, rhombus                      d) none of these</p>
3.	<p>If Rahul has notes of Rs.10 denomination and Rs.100 which is 20 more in number. He wants to deposit Rs.4500 in total in a bank. Then, the correct linear equation representing the situation is:</p> <p>a) <math>10x+100(x+20) = 4500</math>                      b) <math>10x+ 100*20=4500</math> c) <math>10x+100(x-20)=4500</math>                      d) None of these</p>
4.	<p><b>Identify the number:</b></p> <p>i) Unit's digit returns a remainder equal to 0 when divided by 2 and 3. ii) Tens digit is the ten's digit of two times the unit digit plus 3. iii) Hundred's digit is the unit digit of the product of the original number's unit digit with 12.</p> <p>a) 256      b) 316                      c) 216                      d) none of these</p>
5.	<p><b>Identify the missing number of the series 2, 7, 17, 37, _?_</b></p> <p>a) 75      b) 175                      c) 77                      d) none of these</p>
6.	<p>Maria wants to buy 5 distinct sweets but has 5 packets for packing. In how many ways this act can be done.</p> <p>a) 15                      b) 75                      c) 120                      d) none of these</p>
7.	<p>A and B can complete a job working together in 6 days. If A alone can complete the job in 9 days, how long would it take for B alone to complete the job?</p> <p>a) 15 days      b) 16 days                      c) 18 days                      d) none of these</p>

8.

How many lines of symmetry are there ?



- a) 10      b) 8      c) 6      d) none of these

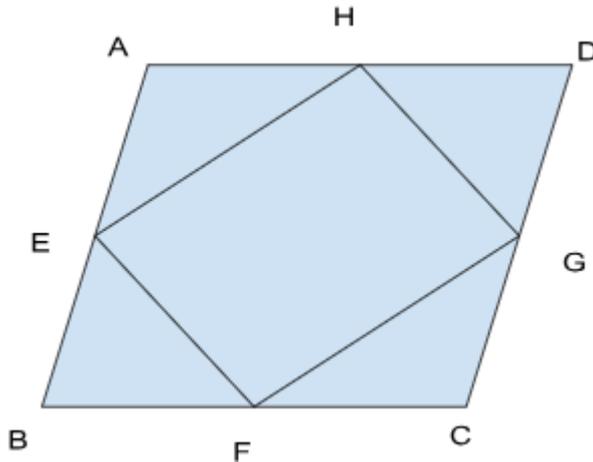
9.

$2^{2^3} - x \times (2^3)^2 = 0$ , find the value of x

- a) 3      b) 1      c) 4      d) none of these

10.

What is the figure EFGH generated on joining the midpoints of the rhombus ABCD?



- a) Rectangle    b) Parallelogram    c) Rhombus    d) None of these

11.

If the weight of the triangle is  $\frac{1}{3}$  of the square and the weight of the circle is double of the triangle, then the weight of each of them.

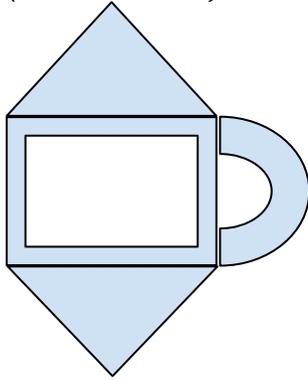


- a) Circle- 12, Triangle-6, Square- 15    b) Circle- 12, Triangle-6, Square- 18  
 c) Circle- 18, Triangle-6, Square- 12    d) None of these

12.

Calculate the total cost of planting trees in this lawn having the below shape at a rate of Rs. 20/m. Side length of the square is 12m and the width between the inner and outer square is 2m. Triangular fields on both the sides are isosceles in nature with equal sides of 10m length and the circular field is having a width of 4m.

(Take  $\pi = 3.14$ )



- a) Rs.3500.00      b) Rs.3298.86      c) Rs.3926.60      d) Rs.3929.60

13.

If  $a:b= 5:4$  and  $b:c=3:2$  then  $a:b:c$  is-

- a) 12:13:15      b) 15:12:10      c)10:12:15      d)none of these

14.

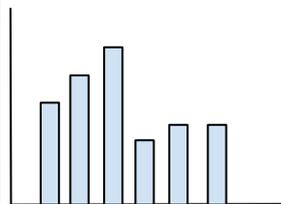
Three persons A,B, and C can do a piece of work in 20,30, and 45 days respectively. How many days will it take if C is assisted by A and B on every 4th day?

- a) More than 6 days      b) 6 days 16 hours      c) 6 days      d) none of these

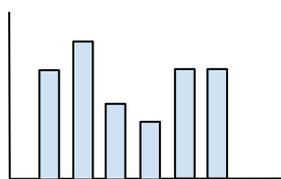
15.

Select the correct histogram:

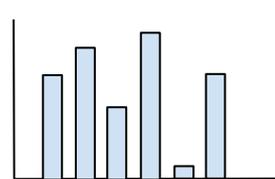
Days	Mon	Tue	Wed	Thurs	Fri	Sat
No. of scooty	250	300	450	180	200	200



(a)



(b)



(c)

None of these

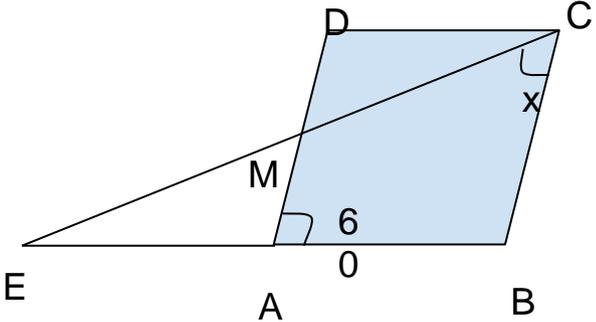
(d)

16.

A is 4 times more efficient worker as B and therefore is able to finish a job in 40 days less than B. Working together, they can do it in:

- a) 25 days      b) 22.5 days      c) 24 days      d)none of these

17.	<p>If <math>a:(b-c) = 1:2</math> , <math>c:(a-b)=3:4</math> and <math>b:(a-c)=5:6</math> then <math>a:b:c =</math></p> <p>a) 1:2:3                      b) 12:14:13                      c)11:15:4                      d)none of these</p>
18.	<p>Guess the missing number 1,4,64,___?___</p> <p>a) 1425                      b) 16384                      c)17456                      d)none of these</p>
19.	<p>Rahul is taller than Lily Lily is shorter than Garima Garima is taller than Rahul</p> <ul style="list-style-type: none"> <li>• If the first two statements are true, the third statement is:</li> </ul> <p>a) true                      b) false                      c) uncertain                      d) information insufficient</p>
20.	<p>A Triangle has three angles in the ratio of 3:4:5. find the measure of the largest angle in degrees:</p> <p>a) 72                      b)45                      c) 75                      d) 60</p>
21.	<p>Simplify the algebraic expression <math>(x-y)(x^3-y^2(x-1))x^3</math>.</p> <p>a) <math>x^5-x^6y^3-x^5y^2-x^3y^2</math>                      b) <math>x^7-x^6y-x^5y^2+(y^3+y^2)x^4-x^3y^3</math> c) <math>x^7-x^6y^2-x^5y^5-x^3y^2</math>                      d) None of these</p>
22.	<p>A rectangular box has dimensions 18cm x 12cm x 9cm. It is completely filled with cubes of 3cm. How many cubes can fit inside the box? Also how much space will be left?</p> <p>a) 45 cubes and <math>72 \text{ cm}^3</math> space will be left b) 72 cubes and no space will be left c) 32 cubes and <math>45\text{cm}^3</math> will be left d) None of these</p>
23.	<p>Determine the angle <math>x</math> (in degrees) if M,N are the midpoints of square ABCD lying in between parallel lines L1 and L2</p> <p>a) 60                      b)72                      c) 75                      d) none of these</p>

24.	<p>The diameter of a circular swimming pool is 14m. A path of 1.5m is built around the pool .Find the area of the path in <math>m^2</math> (take <math>\pi = 3.14</math>)</p> <p>a) 72.005      b) 73.004      c)73.005      d)none of these</p>														
25.	<p>From the above data table identify which observations have highest probability of occurrence and also the point that will be highest in the frequency polygon ( curve representing the frequency of observations wrt the observations )</p> <table border="1" data-bbox="320 520 1278 653"> <tbody> <tr> <td>Observations</td> <td>20</td> <td>30</td> <td>45</td> <td>23</td> <td>11</td> <td>10</td> </tr> <tr> <td>Frequency</td> <td>25</td> <td>25</td> <td>12</td> <td>25</td> <td>20</td> <td>20</td> </tr> </tbody> </table> <p>a) 20,45,23 and observation 45 will have the peak  b) 20,30,23 and all of them will be at the same and highest peak wrt others  c) 20,30,23 and observation 23 will be at the peak  d) None of these</p>	Observations	20	30	45	23	11	10	Frequency	25	25	12	25	20	20
Observations	20	30	45	23	11	10									
Frequency	25	25	12	25	20	20									
26.	<p>In the rhombus ABCD <math>\angle DAB=60</math> degrees, where M is the midpoint of the side AD and also AB is extrapolated such that <math>AE=1/2AB</math>, then find the value of x(in degrees) in the figure.</p>  <p>a) 30      b) 45      c) Figure is impossible      d) None of these</p>														
27.	<p>Simplify it: <math>x^2 2(y+z)+x^2(z(x^y-1))</math></p> <p>a) <math>x^3y^2+x^2yz+x^7z-x^3z^2</math>      b) <math>x^2y^2+x^2yz+ x^7z-x^3z</math>  c) <math>x^3y^2+x^2yz+x^7z</math>      d) None of these</p>														
28.	<p>If <math>a:b= A:2</math>, <math>b:c= (A+1):3</math> and <math>a:(b+c)=A:6</math> then establish a relation between a,b and c.</p> <p>a) <math>a+b+5c=6</math>      b) <math>a+4c+3b=0</math>      c) <math>4a-3b+c=0</math>      d) None of these</p>														
29.	<p>A regular hexagon-shaped garden is surrounded by a circular path. The side lengths of the pentagon are 8m each. Find the area of the circular path (take <math>\pi = 3.14</math>) in square meters.</p> <p>a) 34.56      b) 124.96      c) 203.45      d) 200.96</p>														

30.	<p><b>Identify the total number of integral pair solutions of <math>6x + 9y = 33</math>.</b></p> <p>a) only 3      b) only 4      c) only 2      d) None of these</p>												
31.	<p><b>Which of the following angles have complementary relation:</b></p> <p>a) 36,54      b)37,53      c) 20,60      d) None of these</p>												
32.	<p><b>Which of the following is the fractional form of the recurring decimal notation <math>x=0.\underline{6}</math></b></p> <p>a) 3/4      b) 4/3      c)2/3      d) None of these</p>												
33.	<p><b>Two cars start from the same point but move in the opposite directions with speeds 75 kmph and 60 kmph respectively. Find the time when the distance between them will be 525 km apart</b></p> <p>a) After 32hr      b) After 3 hrs c) after 3 hrs 53 mins 20 seconds      d) none of these</p>												
34.	<p><b>A, B and C can complete a piece of work independently in 20, 30 and 60 days respectively. If A starts the work first and continues it for 5 days, then calculate the time taken by B and C to complete the remaining work if they work together.</b></p> <p>a) 20 days    b) 13 days    c) 15 days    d) None of these</p>												
35.	<p><b>From the above table identify the following:</b></p> <table border="1" data-bbox="331 1123 759 1373"> <thead> <tr> <th>Marks</th> <th>Number of students</th> </tr> </thead> <tbody> <tr> <td>0 - 9</td> <td>27</td> </tr> <tr> <td>10 - 19</td> <td>12</td> </tr> <tr> <td>20 - 29</td> <td>20</td> </tr> <tr> <td>30 - 39</td> <td>24</td> </tr> <tr> <td>40 - 49</td> <td>17</td> </tr> </tbody> </table> <p>i) number of students scoring the highest in the class ii) total number of students scoring more than 30 iii) number of students failed if the pass mark was 25</p> <p>a) 16, 40, 23      b) 17, 41, 39 c)17, 41, more than 39 but less than 59      d) none of these</p>	Marks	Number of students	0 - 9	27	10 - 19	12	20 - 29	20	30 - 39	24	40 - 49	17
Marks	Number of students												
0 - 9	27												
10 - 19	12												
20 - 29	20												
30 - 39	24												
40 - 49	17												
36.	<p><b>The number of lines of symmetry of a n-sided regular polygon is:</b></p> <p>a) <math>n^2</math>    b) <math>n/2</math>    c) n    d) None of these</p>												

37.	<p><b>Fill in the blanks:</b></p> <p>i) A parallelogram has ___ lines of symmetry.  ii) A Circle has _____ lines of symmetry.  iii) A scalene triangle has _____ lines of symmetry.</p> <p>a) 4, infinite , no    b) no, infinite, no    c) 4,no and 3    d) none of these</p>
38.	<p><b>A circular wire of radius 10cm is unwinded to fence around a square box as a mark of identity. The square box stores some valuable items due to which Michael always closes the lid of the box properly. Find the area of the lid of the box in square meter (take <math>\pi = 3.14</math>)</b></p> <p>a) 245.67                      b) 246.49                      c) 227    d) none of these</p>
39.	<p><b>Identify the missing number 12,15,_,?,24,30,33</b></p> <p>a) 16                              b) 25                              c) 30    d) 21</p>
40.	<p><b>A triangle is circumscribed by a circle of radius 5 cm and a circle of 3 cm inscribed by it. Find the area of the triangle.</b></p> <p>a) <math>12\sqrt{4}</math>                      b)16    c)<math>16\sqrt{3}</math>                      d) <i>None of these</i></p>
41.	<p><b>A piece of work can be done by A,B and C respectively in 20,60 and 30 days. If A starts the work and continues for 3 days and then joined by B and A and B together worked for 4 days and they left the remaining work for C. Find the time C will take to complete the remaining work.</b></p> <p>a) 24 days    b) 36 days    c)17 days and 12 hours    d) None of these</p>
42.	<p><b>If <math>a:b=1:2</math> <math>b:(c+a)=3:4</math> find the ratio of <math>a:b:c</math></b></p> <p>a) 3:4:5                      b) 4:6:7                      c) 3:6:5                      d) None of these</p>
43.	<p><b>There is cuboidal shaped room which has a rectangular floor. The floor has to be designed in a way such that a rectangular border of width 2m and also a central circular design has to be tiled. If the rate of designing is Rs. 9.5/m<sup>2</sup> then the total cost to do so is (take <math>\pi=3.14</math>)</b></p> <p>a) Rs.1446.54                      b) Rs. 1484.47                      c) Rs.1456.67                      d) None of these</p>
44.	<p><b>Rearrange the steps of construction below for constructing a rhombus of given dimensions :</b></p> <p>i). Draw an angle of 60 degrees  ii). With one end of line segment of 4 cm length and with an arc of radius of 4cm cut the extended line of 60 degrees angle.  iii). With the intersection point as center draw an arc of same radius and repeat the same from other end of the line segment  iv). Draw a line segment of length 4 cm</p>

	a) iv, iii,i,ii      b) iv, i,iii,ii      c) iv,i,ii,iii      d) None of these
45.	<b><math>4x+5(x-1)=20</math>, Solve for x</b> a)16/9    b)42/7    c)25/9    d)None of these
46.	<b>If a metallic cubical block of volume <math>27 m^3</math> is melted to cast 8 cubical bodies,then what can be the dimensions of the cubical bodies if all are identical.</b> a)side length of each cube will be 1 m    b)side length of each cube will be 1.5m c)side length of each cube will be 2m    d)None of these
47.	<b>Rahul goes to a shop to purchase three types of toffees A,B and C with respective prices. If he purchased 4 toffees of kind A with certain price and 5 toffees of kind B but with half the price of A and also 6 toffees of kind C with price 20 less than B . If the total cost is T, then find the correct equation for the above condition.</b> a) $3x+5(x/2)+6(x-20)=T$ b) $4x+5(x/2)+6(x/2-20)=T$ c) $5x+4(x/2)+6(x/2-20)=T$ d) None of these
48.	<b>If the average of 20 observations is 125 but after browsing the solution some error was found as an observation which was 25 was recorded to be 23. Find the correct mean.</b> a)124.5      b)125.1      c)120      d)None of these
49.	<b>How many diagonals are there in a heptagon?</b> a)7      b)14      c)20      d)None of these
50.	<b>Write true or false against the below statements:</b> i) All rectangles are parallelogram ii) All rhombus are square iii) All parallelogram are rhombus a)T,F,F      b)T,F,T      c)T,T,T      d)T,F,T

## ANSWER KEY

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



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