

CLASS

6

LEVEL

2



**SOF INTERNATIONAL
MATHEMATICS OLYMPIAD
2019-20**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Total Questions: 50 | Time: 1 hr.

Guidelines for the Candidate

1. You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
2. Write your **Name, School Code, Class, Section, Roll No.** and **Mobile Number** clearly on the **OMR Sheet** and do not forget to sign it. We will share your marks / result and other information related to SOF exams on your mobile number.
3. In the school code column in the OMR Sheet, please fill in code allocated to your school and not the exam center code.
4. The Question Paper comprises two sections : **Mathematics** Section (45 Questions) and **Achievers Section** (5 Questions).
Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.
5. All questions are compulsory. There is no negative marking. Use of calculator / smart phone is not permitted.
6. There is only ONE correct answer. Choose only ONE option for an answer.
7. To mark your choice of answers by darkening the circles on the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only. E.g.
Q. 16: Rahul bought 4 kg 90 g of apples, 2 kg 60 g of grapes and 5 kg 300 g of mangoes. The total weight of all the fruits he bought is _____.
A. 11.450 kg B. 11.000 kg C. 11.350 kg D. 11.250 kg
As the correct answer is option A, you must darken the circle corresponding to option A on the OMR Sheet. 16. ● (B) (C) (D)
8. Rough work should be done in the blank space provided in this booklet.
9. Please fill in your personal details in the space provided on this page before attempting the paper.
10. **RETURN THE OMR SHEET AND QUESTION PAPER TO THE INVIGILATOR AT THE END OF THE EXAM.**

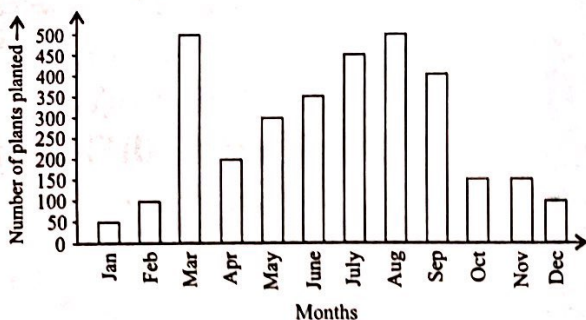


SCIENCE OLYMPIAD FOUNDATION
Inspiring Young Minds Through Knowledge Olympiads

Name:.....

Section:..... SOF Olympiad Roll No.:..... Contact No.:.....

1. The given bar graph shows the number of plants planted in one year in a city. Study the given bar graph carefully and answer the question that follows.



The difference between the total number of plants planted in March and December together and the total number of plants planted in June and October together is _____.

- A. 400
 B. 100
 C. 500
 D. 300
2. There were y females and half as many males as females at a restaurant in the morning. An hour later, thrice the number of females and 60 males visited the restaurant. How many people were at the restaurant altogether?

- A. $4 + \frac{y}{2} + 60$
 B. $4y + \frac{y}{2} + 60$
 C. $4y + \frac{60y}{2}$
 D. $4 + 4y + \frac{1}{2}$

3. Which of the following are arranged in descending order?

- A. CCCII, CCCXLIII, CDXVIII, CDXXVIII
 B. CDXVIII, CDXXVIII, CCCXLIII, CCCII
 C. CDXXVIII, CDXVIII, CCCXLIII, CCCII
 D. None of these

4. Which of the following statement(s) is/are correct?

- A. A parallelogram in which two adjacent angles are equal is a rectangle.
 B. A quadrilateral in which both pairs of opposite angles are equal is a parallelogram.
 C. In a parallelogram, the maximum number of acute angles can be two.
 D. All of these

5. Which of the following figures have at least two lines of symmetry?



- A. Only Q and R
 B. Only P and S
 C. P, Q, R and S
 D. Only P and R

6. Which of the following numbers is not divisible by 11?

- A. 21593
 B. 53372
 C. 61853
 D. 69573

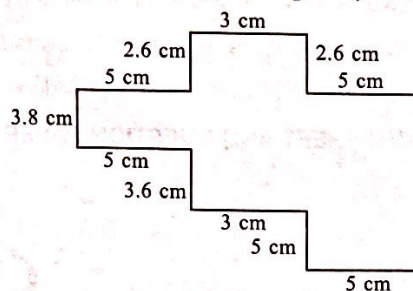
7. Which of the following statements is incorrect?

- A. An infinite number of lines can be drawn passing through one given point.
 B. Points which are not on the same line are called non-collinear points.
 C. The closed curves that do not cross themselves are called simple closed curves.
 D. None of these

8. By how much is the sum of 498.72 and 683.24 is more than their difference?

- A. 1181.96
 B. 847.32
 C. 184.52
 D. 997.44

9. Find the area of given figure (not drawn to scale).



- A. 92 cm^2
 B. 111 cm^2
 C. 132 cm^2
 D. None of these

10. If the sum of two angles is greater than 180° , then which of the following is not possible for the two angles?

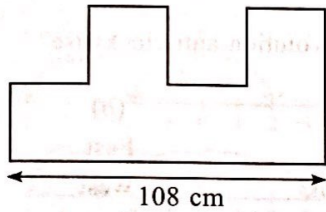
- A. One obtuse angle and one acute angle
- B. One reflex angle and one acute angle
- C. Two obtuse angles
- D. Two right angles

11. Find the difference between the greatest and the smallest 6-digit numbers formed by using the given digits (each digit used only once).



- A. 998889
- B. 588998
- C. 980851
- D. 780831

12. The given figure is made up of six identical squares. Find the perimeter of the given figure.



- A. 296 cm
- B. 398 cm
- C. 378 cm
- D. 108 cm

13. There are XX boxes. XV sweets are placed in each box. If IX sweets are taken away from each box, then how many total sweets are left in the boxes?

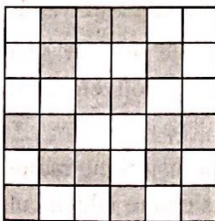
- A. CXX
- B. XXI
- C. XLII
- D. CXLI

14. The product of X, Y and Z is _____.

- (i) $(5 \times 6) + (5 \times 7) = X(6 + 7)$
- (ii) $(63 + 49) + Y = 63 + (49 + 37)$
- (iii) $(3 \times 4) \times 6 = 3 \times (4 \times Z)$

- A. 1850
- B. 2220
- C. 1975
- D. 1110

15. How many minimum number of squares must be shaded to make the given figure symmetrical?



- A. 1
- B. 2
- C. 3
- D. 4

16. Find the value of $\frac{6a+20+3a-4}{4+a}$, if $\frac{6+3a}{2} = 21$.

- A. 64.5
- B. 8.58
- C. 7.75
- D. 63.8

17. What is the successor of predecessor of $72 - (-35) + (-61)$?

- A. -46
- B. 46
- C. 47
- D. 45

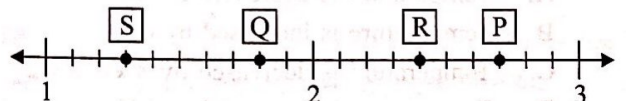
18. Select the incorrect option.

Solid	Net
A.	-
B.	-
C.	-
D.	-

19. If $42 : 165 :: m : 330$, then find the value of $\frac{m}{2} + 6$.

- A. 2
- B. 5/6
- C. 3/4
- D. None of these

20. Find the value of $(R + S) \times (P - Q)$.



- A. 2.43
- B. 4.56
- C. 3.33
- D. 2.78

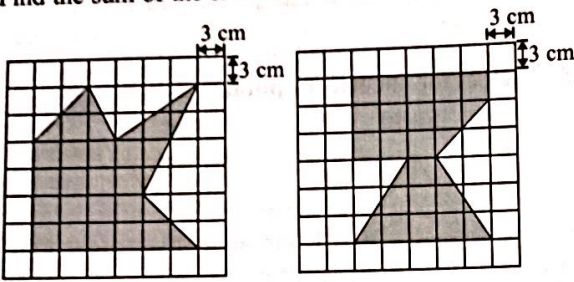
21. The area of a rectangular field is 2688 m^2 and its length is 56 m . Find the cost of fencing the entire field, if the cost of fencing is ₹ 45 per metre.

- A. ₹ 9630
- B. ₹ 9940
- C. ₹ 9360
- D. ₹ 8430

22. The sum of marks obtained by four friends is 546 and their marks are in the ratio $5 : 6 : 7 : 8$. Find the sum of the highest marks and the lowest marks.

- A. 218
- B. 168
- C. 273
- D. 230

23. Find the sum of the shaded areas of the given figures.



- A. 396 cm^2
- B. 207 cm^2
- C. 414 cm^2
- D. None of these

24. Study the given numbers carefully and select the correct option.

(9564) P (656051) Q (768372) R

- (i) Both P and R are divisible by 4.
- (ii) Q is not divisible by 9.
- A. Only (i) is true
- B. Both (i) and (ii) are true
- C. Only (ii) is true
- D. Neither (i) nor (ii) is true

25. The temperature of a city in the morning is -9°C . It falls down in the afternoon to -17°C . What is the change in temperature?

- A. Temperature is decreased by 6°C .
- B. Temperature is increased by 6°C .
- C. Temperature is decreased by 8°C .
- D. Temperature is increased by 8°C .

26. Find the solution for m , if the number 9 when added to a product of the number m and second multiple of 9 results in 90.

- A. 4
- B. 2
- C. 4.5
- D. 3.5

27. Round off $[82991 + 69 \{42 - 6(26 - 9) + 150\}]$ to the nearest hundreds.

- A. 89200
- B. 89000
- C. 89210
- D. 89201

28. A man is standing facing North. In which direction will he face, if he makes

- (a) $1\frac{1}{4}$ revolution clockwise?
- (b) $\frac{3}{4}$ revolution anti-clockwise?

- | | | | |
|-----|-------|-----|------|
| (a) | East | (b) | East |
| B. | South | | West |
| C. | South | | East |
| D. | West | | West |

29. Mihika makes 8 gift packs containing chocolates for Diwali. She puts 12 vanilla chocolates, 14 milk chocolates and 8 nut chocolates in each pack. With the help of which property, can you calculate the total number of chocolates in 8 packs?

- A. Commutative property
- B. Associative property
- C. Distributive property
- D. None of these

30. The ratio of number of cookies in jar A to the number of cookies in jar B was $5 : 8$. If Ajay sold $\frac{2}{5}$ of cookies from jar A and left with 2457 cookies in jar A, then what was the total number of cookies in jars A and B?

- A. 14607
- B. 10647
- C. 19118
- D. 24507

31. Arrange the given steps in correct order of constructing an angle of 90° using ruler and compass.

Step 1 : Place the pointer of the compasses at O and draw an arc of convenient radius which cuts the line at A .

Step 2 : Without disturbing radius on compasses, draw an arc with A as centre which cuts the first arc at B .

Step 3 : With B and C as centres and with any convenient radius, draw two arcs to intersect each other at L .

Step 4 : Again without disturbing the radius on the compasses and with B as centre, draw an arc which cuts the first arc at C .

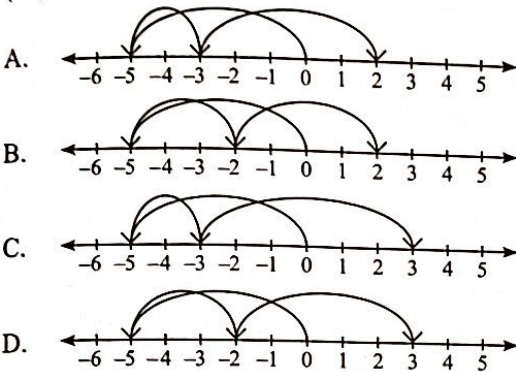
Step 5 : Draw any line PQ and take a point O on it.

Step 6 : Join OL .

$\angle LOA$ is the required angle whose measure is 90° .

- A. 4-1-2-3-5-6
- B. 2-1-4-3-5-6
- C. 1-2-4-3-5-6
- D. 5-1-2-4-3-6

32. Which of the following number lines shows $(-5) + 3 + 4$?



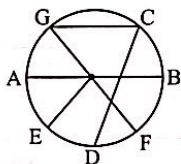
33. The given table shows different type of fruits bought by Aakash. Study the given table carefully and answer the following question.

Fruits	Tally Marks
Apple	
Banana	
Pear	
Orange	

If the cost of 1 apple is ₹ 5, 2 bananas is ₹ 6, 1 pear is ₹ 10 and 1 orange is ₹ 8, then find the total cost of apples, bananas and oranges bought by Aakash.

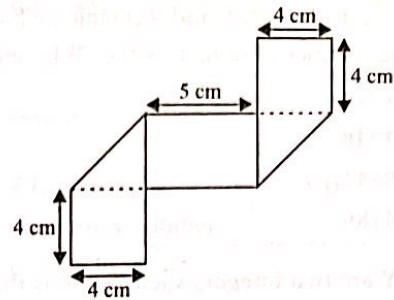
- A. ₹ 155
- B. ₹ 165
- C. ₹ 205
- D. ₹ 195

34. How many chords are there in the given figure?



- A. 3
- B. 4
- C. 2
- D. 5

35. A rectangular piece of paper is folded as shown here. Find the area of the paper before it is folded.

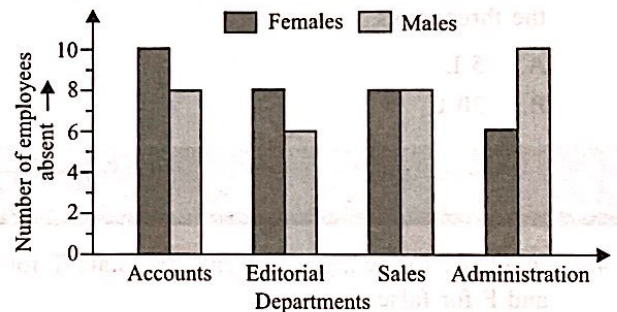


- A. 18 cm^2
- B. 20 cm^2
- C. 22 cm^2
- D. 84 cm^2

36. $\frac{5}{8}$ of a tower is in the cement. When $\frac{2}{3}$ of it is pulled out, 10 m tower still remains in the cement. What is the full length of the tower?

- A. 24 m
- B. 48 m
- C. 15 m
- D. 32 m

Direction (37-38) : The given bar graph shows the number of employees absent, in 4 departments in an office in one day. Study the given graph carefully and answer the given questions.



37. Which department has the maximum number of absent employees?

- A. Administration
- B. Accounts
- C. Editorial
- D. Sales

38. What is the ratio of total number of females to the total number of males absent in 4 departments?

- A. 2 : 5
- B. 3 : 4
- C. 1 : 1
- D. 1 : 3

39. I am a five digit number. If you exchange the smallest and the largest digit from the greatest number formed by the digits 3, 4, 7, 8 and 9 (using each only once), then the number obtained, is me. Who am I?

- A. 38749
- B. 93748
- C. 98743
- D. 34789

40. X and Y are two integers such that X is the successor of $12 + (-5)$ and Y is the predecessor of $X + 2$. Find the value of $X + Y$.

- A. 8
- B. 9
- C. 19
- D. 17

41. Kirti had 88 books more than Karan. After Karan bought another 23 books, Karan had $\frac{7}{8}$ as many books as Kirti had. How many books did Kirti have?

- A. 165
- B. 432
- C. 581
- D. 520

42. Three water tanks contains 1575 L, 1785 L and 1980 L of water respectively. Find the maximum capacity of the bucket that can exactly measure the water of the three tanks.

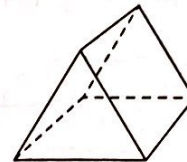
- A. 5 L
- B. 30 L

- C. 15 L
- D. 2 L

43. Select the correct statement.

- A. If the dividend and divisor have opposite signs, then the quotient will be negative.
- B. If two numbers are of same sign, then their product is positive.
- C. If the addends are of same sign, then sign of their sum is same as the sign of the addends.
- D. All of these

44. How many faces, vertices and edges are there in the given figure respectively?



- A. 5, 4, 6
- B. 2, 4, 6
- C. 5, 6, 9
- D. 4, 6, 9

45. Simplify : $\left(\left(3\frac{1}{2} + 4\frac{1}{3} \times \frac{3}{13} - \frac{1}{2} \div 4 \right) + \frac{35}{16} \right)$

$$+ \left((32 - 16) \div \frac{1}{8} - 64 \times \frac{1}{(10 - 2)} + 6 \right)$$

- A. 213
- B. 130
- C. 128
- D. 317

ACHIEVERS SECTION

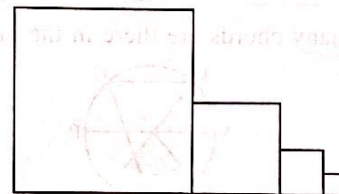
46. Read the following statements and state T for true and F for false.

- (i) A segment of a circle is a region in the interior of the circle enclosed by an arc and a chord.
- (ii) \odot is a closed curve.
- (iii) Quadrilateral is the polygon with least number of sides.
- (iv) The perpendicular bisector of a line segment is a perpendicular to the line segment that divides it into two equal parts.

- | | (i) | (ii) | (iii) | (iv) |
|----|-----|------|-------|------|
| A. | T | F | F | F |
| B. | T | T | F | T |
| C. | F | F | F | T |
| D. | T | F | F | T |

47. The given figure is made up of four squares. The side of the largest square is 24 cm. If the side of every consecutive square is half of its adjacent square, then find

- (i) the perimeter of the figure.
- (ii) the area of the figure.



- | | (i) | (ii) |
|----|--------|---------------------|
| A. | 138 cm | 495 cm ² |
| B. | 135 cm | 795 cm ² |
| C. | 138 cm | 765 cm ² |
| D. | 134 cm | 765 cm ² |

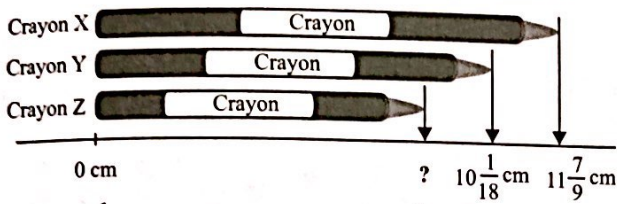
48. Read the following statements carefully and select the correct option.

Statement-I : If Ankita has 50 paise, 25 paise and 10 paise coins in the ratio 7 : 5 : 9 respectively, amounting to ₹ 113, then the number of coins of 25 paise is 100.

Statement-II : If the first three terms of a proportion are 30, 60 and 45, then its fourth term is 90.

- A. Both Statement-I and Statement-II are true.
 B. Both Statement-I and Statement-II are false.
 C. Statement-I is true but Statement-II is false.
 D. Statement-I is false but Statement-II is true.

49. The length of Crayon Y is exactly half way between the lengths of Crayon X and Crayon Z. What is the total length of Crayons X, Y and Z?



- A. $19\frac{1}{6}$ cm B. $30\frac{1}{6}$ cm
 C. $42\frac{1}{9}$ cm D. $28\frac{2}{9}$ cm

50. Match the following and select the correct option.

Column I

Column II

(i) If $\frac{1}{5} - \frac{a}{3} = \frac{4}{5}$,
then $a =$ (p) 5

(ii) 2 less than 5
times of a number
is 103. Find the
number. (q) $-1\frac{4}{5}$

(iii) The coefficient of x
in the expression
 $5x + 3y = 4$ is (r) $-\frac{1}{2}$

(iv) If $2\frac{1}{2} - \frac{2}{3}m = 3\frac{1}{2}$,
then $m =$ (s) 21

- | | | | | |
|----|-----|------|-------|------|
| | (i) | (ii) | (iii) | (iv) |
| A. | (q) | (p) | (s) | (r) |
| B. | (s) | (q) | (r) | (p) |
| C. | (s) | (p) | (q) | (r) |
| D. | (q) | (s) | (p) | (r) |

SPACE FOR ROUGH WORK