IMO

SOF INTERNATIONAL MATHEMATICS OLYMPIAD
2023-24

CLASS 6

QUESTION PAPER SET **B**

SOF CELEBRATING 25 Years of INSPIRING YOUNG MINDS
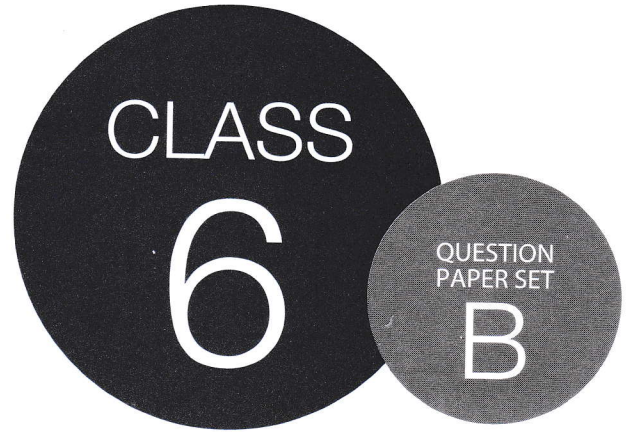
Total Questions: 50 | Time: 1 hr.

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. The Question Paper comprises four sections:
   Logical Reasoning (15 Questions), **Mathematical Reasoning** (20 Questions), **Everyday Mathematics** (10 Questions) and **Achievers Section** (5 Questions)
   Each question in Achievers Section carries 3 marks, whereas all other questions carry one mark each.
4. All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
5. There is only ONE correct answer. Choose only ONE option for an answer.
6. 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. ● Ⓑ Ⓒ Ⓓ
7. Rough work should be done in the blank space provided in the booklet.
8. Return the OMR Sheet to the invigilator at the end of the exam.
9. Please fill in your personal details in the space provided before attempting the paper.
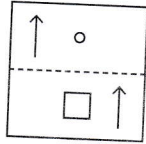
Name:..

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

SOF
SCIENCE OLYMPIAD FOUNDATION
Inspiring Young Minds Through Knowledge Olympiads

1. A square transparent sheet with a pattern and a dotted line on it is given. Select a figure from the options as to how the pattern would appear when the transparent sheet is folded along the dotted line.


A.

B.

C.

D.

2. Which of the following options will complete the given series?

   25K, 27N, 30Q, 34T, _?_, 45Z

   A. 39W
   B. 39X
   C. 38W
   D. 39V

3. Pointing to a person, Rekha said, "He is the father of my daughter's brother." How is that person related to Rekha?

   A. Father
   B. Uncle
   C. Brother
   D. Husband

4. If 'L' stands for 'addition', 'M' stands for 'multiplication', 'N' stands for 'division' and 'P' stands for 'subtraction', then find the value of 26 L 18 N 3 P 6 M 5.

   A. 6
   B. 2
   C. 12
   D. 5

5. Group the given figures into three classes on the basis of their identical properties using each figure only once.
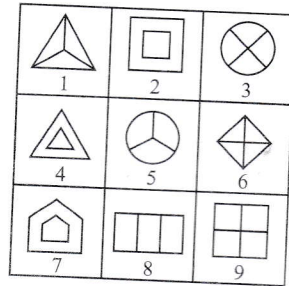
   A. 1, 6, 8; 2, 4, 9; 3, 5, 7
   B. 1, 5, 8; 2, 6, 9; 3, 4, 7
   C. 1, 6, 9; 2, 4, 7; 3, 5, 8
   D. 1, 5, 8; 2, 4, 7; 3, 6, 9

6. Which of the following alphabets lies on the face opposite to the face having alphabet E, when the given sheet is folded to form a cube?
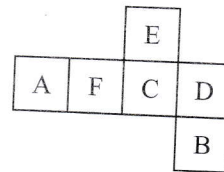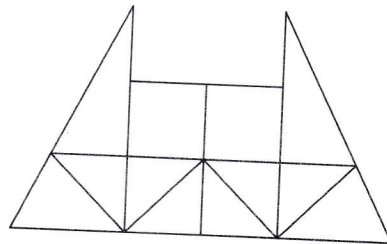

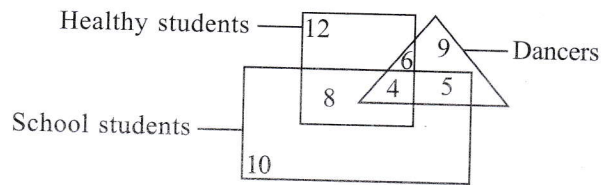   A. F
   B. B
   C. A
   D. D

7. Select the odd one out.

   A. SVX
   B. JMO
   C. HKM
   D. EGJ

8. Find the number of triangles formed in the given figure.

   A. 13
   B. 14
   C. 15
   D. More than 15

9. In the given Venn diagram, which of the following number represents school students who are healthy but not dancers?
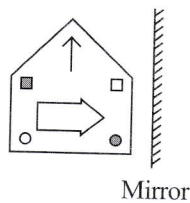
Healthy students — 12

9 — Dancers

6

8 4 5

School students —

10

A. 8
B. 4
C. 6
D. 5

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10. Arrange the given words as they occur in a dictionary and select the correct option.

1. Cloud   2. Cough
3. Climb   4. Catch
5. Cutting

A. 2, 4, 3, 1, 5
B. 4, 3, 1, 2, 5
C. 4, 1, 3, 2, 5
D. 2, 1, 3, 4, 5

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11. Select the correct mirror image of the given figure.

Mirror
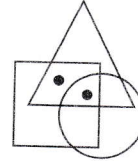
A.

B.

C.

D.

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12. In a certain code language, if BHOPAL is written as HBPOLA, then how will PUNJAB be written in the same code language?

A. NUPBAJ
B. UPJBAN
C. UPJNBA
D. NPUJBA

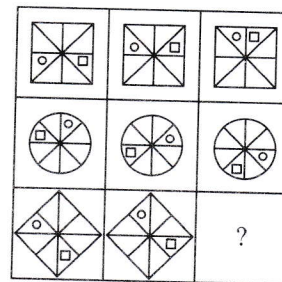13. Which of the following options satisfies the same conditions of placement of dots as in the given figure?

A.

B.

C.

D.

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14. Aryan is facing towards North-East. He turns 135° clockwise and then 270° anti-clockwise. In which direction is he facing now?

A. North-West
B. West
C. South
D. South-West

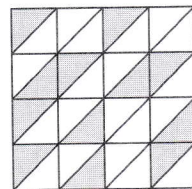15. Select a figure from the options which will complete the given figure matrix.

A.

B.

C.

D.

16. Which of the following options shows the same result as the shaded fraction of the given figure?


- A. $\dfrac{3}{4} + \dfrac{1}{8}$
- B. $\dfrac{3}{4} + \dfrac{2}{5}$
- C. $\dfrac{1}{4} + \dfrac{1}{8}$
- D. $\dfrac{1}{4} + \dfrac{1}{6}$

17. Find the ratio of the number of vowels to the number of consonants in the given word.

    AUSTRALIA

- A. 4 : 5
- B. 5 : 4
- C. 5 : 9
- D. 4 : 9

18. Which of the following squares must be unshaded so that the given figure has a line of symmetry?
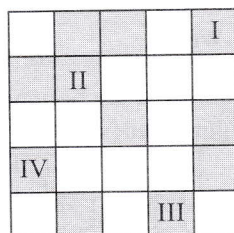
- A. IV
- B. I
- C. III
- D. II

19. Compare and fill the box.

    172 + 151 − 79 ☐ (− 248) + 121 + 65

- A. <
- B. =
- C. >
- D. Can't be determined

20. Find the difference between the successor of greatest 5-digit number and the predecessor of 5150.

- A. 94851
- B. 4852
- C. 94849
- D. 94850

21. Select the correct option.

- A. Two pairs of parallel sides - Trapezium
- B. A rhombus with 4 right angles - Rectangle
- C. Parallelogram with 4 right angles - Rectangle
- D. None of these

22. Find the sum of first five multiples of smallest composite number.

- A. 25
- B. 65
- C. 60
- D. 20

23. Find the perimeter of the given figure (not drawn to scale).
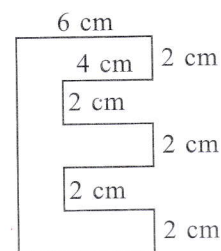
- A. 52 cm
- B. 48 cm
- C. 40 cm
- D. None of these

24. 64.327 × 257.2 × 0.0097 is same as

- A. 6.4327 × 25.72 × 0.097
- B. 6.4327 × 2.572 × 0.97
- C. 64327 × 2572 × 0.0000097
- D. 6.4327 × 2.572 × 9.7

25. Find the number of angles formed inside the given figure.
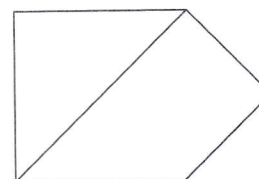
- A. 8
- B. 9
- C. 7
- D. None of these

26. If P is the sum of MCMLIX and MDCCLXV, then which of the following options shows the result when P is rounded off to nearest thousands?

- A. 3000
- B. 3500
- C. 4000
- D. 3800

Direction (27-28) : Anurag made a pictograph which shows the number of customers visited during the first week in his new salon.

Days	Number of customers
Monday	✂✂✂✂✂
Tuesday	✂✂
Wednesday	✂✂✂✂✂✂
Thursday	✂✂✂
Friday	✂✂✂✂
Saturday	✂✂
Sunday	✂✂✂✂✂✂✂

Each ✂ represents 8 customers.

27. How many less customers visited the salon on Tuesday and Thursday together than on Sunday?
   - A. 24
   - B. 18
   - C. 12
   - D. 20

28. Find the fraction of the number of customers visited on Friday, Saturday and Sunday altogether to the total number of customers visited in the whole week.
   - A. $\dfrac{7}{29}$
   - B. $\dfrac{13}{31}$
   - C. $\dfrac{15}{31}$
   - D. $\dfrac{5}{27}$

29. What should be subtracted from 9th multiple of 18 to get 7th multiple of 15?
   - A. 57
   - B. 68
   - C. 52
   - D. 49

30. Which of the following options will not represent a whole number?
   - A. $1 + 0$
   - B. 0×0
   - C. $\dfrac{1}{2-2}$
   - D. $\dfrac{0}{2}$

31. How many of the given letters have perpendicular lines?
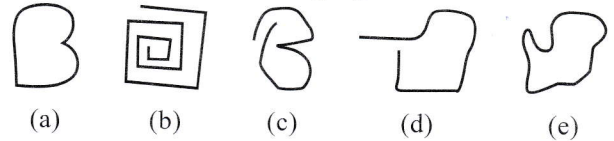
EIGHT

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

32. If 5, 4, x, 18 are in proportion, then the value of x is
   - A. $\dfrac{45}{2}$
   - B. 20
   - C. 22
   - D. 23

33. How many of the following figures are closed?

   (a)   (b)   (c)   (d)   (e)

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

34. Which of the following options shows the expression for, "The product of 18 and x is divided by twice the sum of 18 and x"?
   - A. $\dfrac{18x}{18+2x}$
   - B. $\dfrac{18x}{2(18+x)}$
   - C. $\dfrac{18 \times 2x}{18+x}$
   - D. $\dfrac{18+x}{2(18x)}$

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

   7 cm
   20 cm
   28 cm
   20 cm
   8 cm
   7 cm
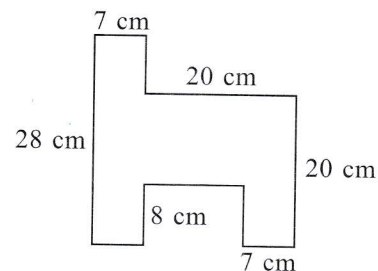
   - A. 418 sq. cm
   - B. 492 sq. cm
   - C. 504 sq. cm
   - D. None of these

36. A truck carries 45 boxes. Each of the boxes contains 30 packages. Each of the packages contains 12 toy cars. How many total toy cars are carried in the truck?

    A. 14800
    B. 15700
    C. 16200
    D. 16800

37. Kartik has a string of length 416 cm. He used the string to make two identical squares. Find the side of each square.

    A. 42 cm
    B. 48 cm
    C. 18 cm
    D. 52 cm

38. If two tankers contain 850 litres and 680 litres of kerosene oil respectively, then the maximum capacity of a container which can measure the kerosene oil out of both the tankers when used an exact number of times is _____.

    A. 170 litres
    B. 85 litres
    C. 34 litres
    D. 10 litres

39. A farmer has a total of 175 chickens and ducks on his farm. The ratio of number of chickens to the number of ducks is 3 : 2. If he gives 38 chickens and 25 ducks to his brother, then how many chickens will be left with him?

    A. 35
    B. 67
    C. 54
    D. 47

40. In a group of 27 boys and 32 girls, $\frac{1}{3}$ of the boys failed in a test while $\frac{1}{4}$ of the girls passed in the test. What fraction of the group passed the test?

    A. $\frac{33}{59}$

    B. $\frac{19}{59}$

    C. $\frac{21}{59}$

    D. $\frac{26}{59}$

41. An institution bought 24 whiteboards and 420 computers. If the cost of each whiteboard is ₹ 4200 and that of each computer is ₹ 24000, then find the total amount spent by the institution on whiteboards and computers.

    A. ₹ 10180800
    B. ₹ 1500000
    C. ₹ 2106000
    D. ₹ 4200200

42. In a family, consumption of sugar is 45 kg in 90 days. In how many days will the family consume 360 kg sugar?

    A. 720
    B. 480
    C. 640
    D. 600

43. Some tiles are required to cover the swimming pool base of dimensions 5.6 m by 4.2 m with the rectangular tiles. Find the number of tiles required, if length and breadth of each tile are 12 cm and 8 cm respectively.

    A. 2450
    B. 3100
    C. 2720
    D. 2350

44. Priya made cookies. She gives some cookies to her friends, still 15 cookies are left with her. If the number of cookies Priya gave is x, then find the total number of cookies made by her.

    A. $15 - x$
    B. $x - 15$
    C. $x + 15$
    D. $x - 10$

45. During the day, a petrol pump was filled up with 560.75 L and 343.35 L of petrol. The quantity of petrol sold during the day was 615.45 L. How much petrol is left in the pump at the end of the day?

    A. 272.35 L
    B. 288.65 L
    C. 218.65 L
    D. None of these

46. Solve the following and select the correct option.

(i) Find the area of the given figure (not drawn to scale).
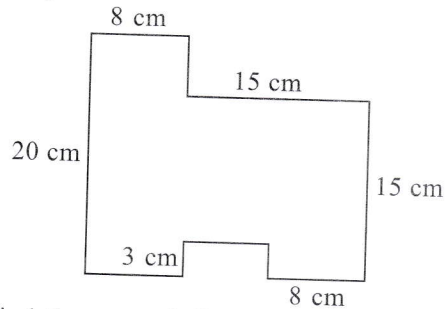
(ii) Find the cost of tiling a rectangular piece of land 500 m long and 200 m wide at the rate of ₹ 8.5 per hundred sq. m.

	(i)	(ii)
A.	258 sq. cm	₹ 8500
B.	290 sq. cm	₹ 7000
C.	364 sq. cm	₹ 8500
D.	318 sq. cm	₹ 9500

47. Fill in the blanks and select the correct option.

(i) The value of 2412.378 + 1598.542 − 3197.08, is ___**(P)**___ .

(ii) If the cost of 43 school bags is ₹ 19543.50, then the cost of 1 school bag is ___**(Q)**___ .

(iii) The shaded decimal part of the given below figure is ___**(R)**___ .
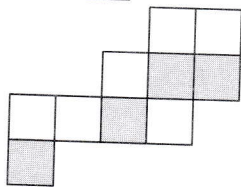
	(P)	(Q)	(R)
A.	813.90	₹ 355.40	0.4
B.	813.84	₹ 454.50	0.5
C.	754.44	₹ 395.50	0.6
D.	813.84	₹ 454.50	0.4

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

Statement-I : The smallest 4-digit number which is exactly divisible by 18, 24 and 32, is 1152.

Statement-II : The common prime factors of 16 and 50 are 2 and 3.

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. Read the given statements carefully and state T for true and F for false.

(i) The greatest 6-digit even number that can be formed by using the digits 5, 2, 1 and 3 (using each digit at least once) is 533312.

(ii) The number 75189312 in International system of numeration is written as seventy five million one lakh eighty nine thousand three hundred and twelve.

(iii) If X is the sum of place values of digit 5 and 8 in the number 25698714, then the successor of X is 5007999.

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

50. Match the following and select the correct option.

Column-I		Column-II
(p) The additive inverse of (−40) − (−57) − (90) is ____ .	(i)	− 99
(q) The successor of predecessor of − 99 is ____ .	(ii)	109
(r) The difference between the greatest 4-digit number and the additive inverse of (−9890) is ____ .	(iii)	73

A. (p) → (iii); (q) → (ii); (r) → (i)
B. (p) → (ii); (q) → (i); (r) → (iii)
C. (p) → (iii); (q) → (i); (r) → (ii)
D. (p) → (ii); (q) → (iii); (r) → (i)

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK