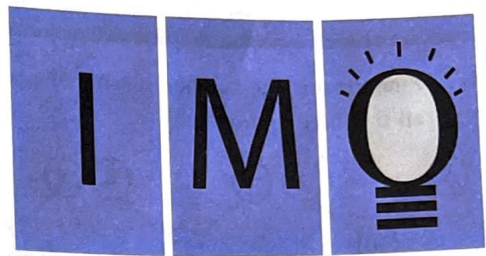


CLASS  
7

QUESTION  
PAPER SET

A



**SOF INTERNATIONAL  
MATHEMATICS OLYMPIAD  
2022-23**

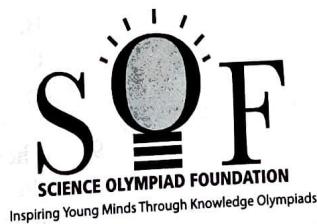
DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Total Questions: 50 | Time: 1 hr.

### Guidelines for the Candidate

- You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
- Write your **Name, School Code, Class, 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.
- 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.
- All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
- There is only ONE correct answer. Choose only ONE option for an answer.
- 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.
- Rough work should be done in the blank space provided in the booklet.
- Return the OMR Sheet to the invigilator at the end of the exam.
- Please fill in your personal details in the space provided on this page before attempting the paper.

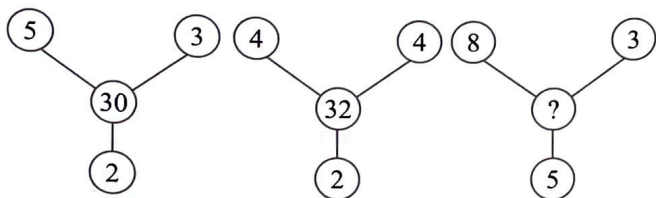
16. ● (B) (C) (D)



Name:.....

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

1. Find the missing number, if same rule is followed in all the three figures.



- A. 110  
B. 120  
C. 80  
D. 95

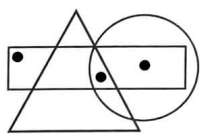
2. How many such pairs of letters are there in the word **ORDINAL** each of which has the same number of letters between them as in the English alphabets?

- A. One  
B. Two  
C. Three  
D. None

3. If '-' stands for division, '+' stands for multiplication, '÷' stands for subtraction and '×' stands for addition, then find the value of  $75 \times 5 \div 80 - 16 + 3$ .

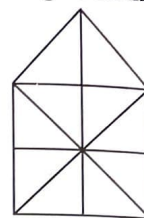
- A. 60  
B. 70  
C. 80  
D. 65

4. Which of the following options does not satisfy the same conditions of placement of dots as in the given figure?



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

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

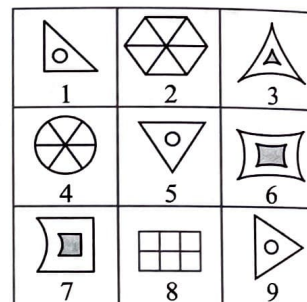


- A. 18  
B. 15  
C. 17  
D. More than 18

6. Select the odd one out.

- A. 43  
B. 80  
C. 15  
D. 90

7. Group the given figures into three classes on the basis of their identical properties using each figure only once.



- A. 1, 2, 3; 4, 6, 9; 5, 7, 8  
B. 1, 5, 6; 2, 3, 4; 7, 8, 9  
C. 1, 5, 9; 2, 4, 8; 3, 6, 7  
D. 1, 2, 4; 5, 6, 8; 3, 7, 9

8. How many 2's are there in the given sequence each of which is immediately preceded by an odd number but not immediately followed by 4?

4 5 2 9 7 6 2 1 5 2 8 9 3 4 5 7 9 2 4

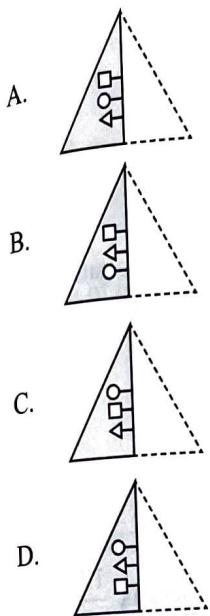
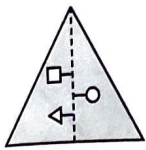
- A. None  
B. One  
C. Two  
D. More than two

9. There is a certain relationship between the terms on the either side of ::. Identify the relationship on left pair and find the missing term.

BHN : EKQ :: DJP : ?

- A. EKQ  
B. GMS  
C. HLR  
D. JPV

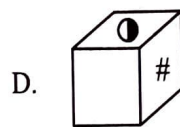
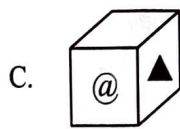
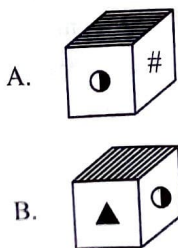
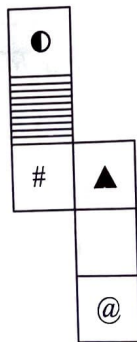
10. A transparent sheet with a pattern and a dotted line on it is given. Select a figure from the options as to how the pattern would appear when the transparent sheet is folded along the dotted line.



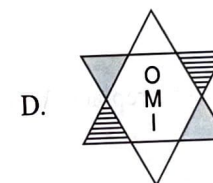
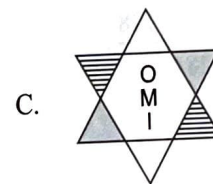
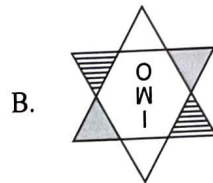
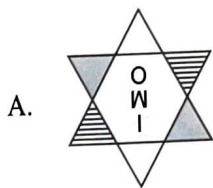
11. Pointing towards Shikha, Vansh said, "She is the daughter of the only child of my grandfather." How is Shikha related to Vansh?

- A. Daughter  
B. Mother  
C. Sister  
D. Aunt

12. Choose a box from the options that is similar to the box formed when the given sheet is folded to form a box.



13. Find the correct water image of the given figure.



14. In a certain code language, INACTIVE is coded as CXGVACKL. How will OPERATOR be coded in the same code language?

- A. PGNQPQRC  
B. NODQBUPS  
C. PQRCPGNQ  
D. PQFSBUPS

15. Manish walks 10 m towards South. From there, he walks 6 m towards North. Then he walks 3 m towards West. How far and in which direction is he now with respect to his starting point?

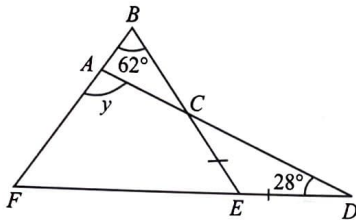
- A. 7 m, North-West  
B. 5 m, South-East  
C. 5 m, South-West  
D. 7 m, North-East

# MATHEMATICAL REASONING

16.  $\frac{25\% \text{ of } 50\% \text{ of } 100\%}{25 \text{ of } 100 \times 50\% \text{ of } 100}$  is equal to \_\_\_\_\_.

- A. 0.0001%
- B. 0.1%
- C. 0.01%
- D. 1%

17. In the figure (not drawn to scale),  $ADF$  and  $BEF$  are triangles and  $EC = ED$ , find the value of  $y$ .



- A.  $90^\circ$
- B.  $91^\circ$
- C.  $92^\circ$
- D.  $93^\circ$

18. Find the value of  $\frac{(21)^{17} \times (18)^{21} \times 128}{(6)^7 \times (28)^4}$ .

- A.  $2^{11} \times 3^{53} \times 7^{14}$
- B.  $2^{13} \times 3^{53} \times 7^{13}$
- C.  $2^{14} \times 3^{23} \times 7^{13}$
- D.  $2^{13} \times 3^{52} \times 7^{13}$

19. Which of the following value will replace  $X$  in the given expression?

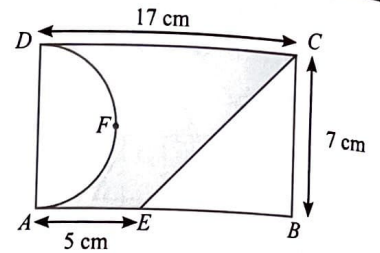
$$(-91) \div X + 68 \div (-17) = -11$$

- A. 13
- B. 7
- C. 12
- D. 9

20. The sum of the digits of a two-digit number is 10. If ten's digit is one more than two times of unit's digit, then find the number.

- A. 82
- B. 73
- C. 64
- D. 91

21. In the given figure (not drawn to scale),  $ABCD$  is a rectangle in which  $CE$  intersects  $AB$  at point  $E$  and  $ADFA$  is a semicircle whose diameter is  $AD$ . What is the area of the unshaded region of the given figure?



- A.  $71.25 \text{ cm}^2$
- B.  $67.75 \text{ cm}^2$
- C.  $61.25 \text{ cm}^2$
- D.  $77.75 \text{ cm}^2$

22. If two supplementary angles are in the ratio 4 : 5, then find the difference between the angles.

- A.  $78^\circ$
- B.  $54^\circ$
- C.  $126^\circ$
- D.  $20^\circ$

23. The sum of three rational numbers is  $\frac{17}{48}$ . If two of them are  $\frac{-7}{8}$  and  $\frac{5}{12}$ , then find the third rational number.

- A.  $\frac{7}{16}$
- B.  $\frac{5}{18}$
- C.  $\frac{13}{16}$
- D.  $\frac{11}{18}$

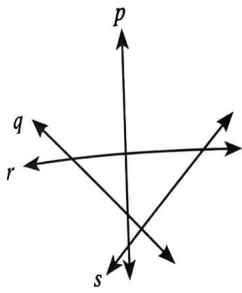
24. Find the value of  $2a^2 + b^2 + 5ab + 9$ , when  $a = -3$  and  $b = -2$ .

- A. 14
- B. 61
- C. 74
- D. 45

25. The average weight of 10 students of class 7 is 36 kg. If the average weight of 8 of them is 34 kg, then find the sum of weights of remaining two students.

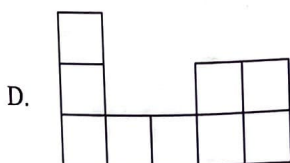
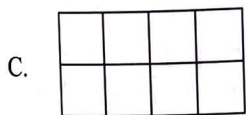
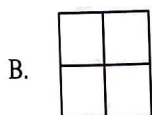
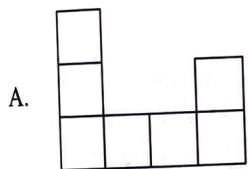
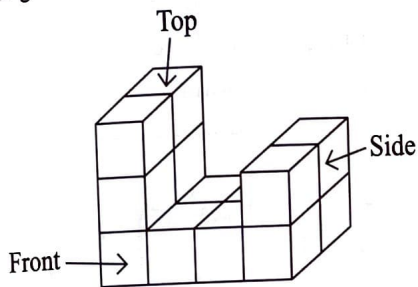
- A. 88 kg
- B. 45 kg
- C. 70 kg
- D. None of these

26. Find the number of pairs of intersecting lines in the given figure.



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

27. Which of the following options shows the front view of the given figure?



28. If  $\frac{3}{7}$  of a number is 33.75, then what is the value of  $\frac{5}{7}$  of that number?

- A. 78.50  
B. 65.75  
C. 68.25  
D. 56.25

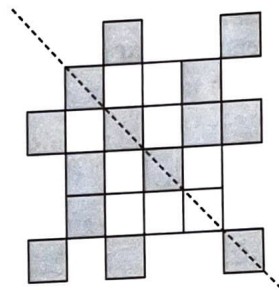
29. Which of the following options shows the integers arranged in descending order?

- A.  $-43, -37, -12, 0, 6, 18$   
B.  $-43, -12, -37, 0, 6, 18$   
C.  $18, 6, 0, -12, -37, -43$   
D.  $18, 6, 0, -43, -37, -12$

30. Which of the following numbers is not divisible by 8?

- A. 765176  
B. 556764  
C. 772648  
D. 555112

31. How many minimum number of shaded squares must be unshaded to make the given figure symmetric along the dotted line?

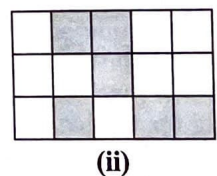


- A. 1  
B. 2  
C. 3  
D. 4

32. Find the difference between the place values of two 7's in 476785.

- A. 9300  
B. 67400  
C. 25700  
D. 69300

33. Find the sum of shaded fractions of the given figures.



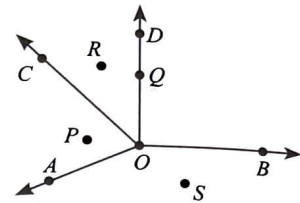
- A.  $\frac{23}{25}$   
B.  $\frac{31}{40}$   
C.  $\frac{27}{40}$   
D.  $\frac{13}{27}$

34. For which value of  $x$ , the given ratios will form a proportion?

$$35 : 65 :: 56 : x$$

- A. 91  
B. 78  
C. 117  
D. 104

35. Which of the following points will lie to the exterior of  $\angle COD$ ?



- A.  $Q, B$  and  $S$   
B.  $Q, B, S$  and  $P$   
C.  $B, S, A$  and  $P$   
D.  $C, P, A$  and  $S$

## EVERYDAY MATHEMATICS

36. The given observations shows the number of masks sold by a shopkeeper on different days of a week.

37, 57, 48, 33, 39, 64, 86

Find the average sale of masks sold.

- A. 54  
B. 47  
C. 49  
D. 52

37. A farmer borrowed ₹ 5500 at 8% per annum. After 5 years, he cleared the account by giving ₹ 6000 and a cow. Find the cost of the cow.

- A. ₹ 2100  
B. ₹ 1900  
C. ₹ 1700  
D. ₹ 1500

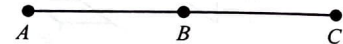
38. Radhika earns ₹ 20000 per month. She spends  $\frac{1}{5}$  of her income on food,  $\frac{3}{10}$  of the income on house rent and  $\frac{9}{20}$  of income on the education of children. How much money is still left with her?

- A. ₹ 1000  
B. ₹ 8500  
C. ₹ 1050  
D. ₹ 9500

39. Aayush bought a school bag for ₹ 736.45 and a belt for ₹ 384.85. He gave a note of ₹ 2000 to the shopkeeper. How much amount will he get back from the shopkeeper?

- A. ₹ 878.70  
B. ₹ 935.35  
C. ₹ 694.75  
D. ₹ 782.65

40. There are three places  $A, B, C$  in a straight line as shown below. If distance between place  $A$  and  $B$  is  $(2.4 \times 10^6)$  m and distance between place  $B$  and  $C$  is  $(5.2 \times 10^5)$  m, then find the distance between place  $A$  and  $C$  in standard form.



- A.  $(292 \times 10^6)$  km  
B.  $(2.92 \times 10^6)$  m  
C.  $(292 \times 10^5)$  m  
D.  $(2.92 \times 10^4)$  m

41. To reach school from his house, Rachit went 12 km towards South, then 5 km towards West. What is the shortest distance between Rachit's house and his school?

- A. 13 km  
B. 14 km  
C. 15 km  
D. 16 km

42. Samar divides his wealth among his three sons Sahil, Varun and Amit in the ratio of 5 : 3 : 7. If Varun gets ₹ 73,125, then find the total wealth of Samar.

- A. ₹ 2,75,875  
B. ₹ 3,65,625  
C. ₹ 3,75,825  
D. ₹ 2,65,675

43. Amaira purchased a rectangular colour paper sheet of length 222 cm and breadth 138 cm to make greeting cards. How many greeting cards of square shape having side 6 cm can she make from it?

- A. 876  
B. 768  
C. 851  
D. None of these

44. Ankush got ₹ 500 on his birthday. On the next day, he got ₹ 350 as pocket money from his father and spent ₹ 275 on repairing his cycle. On the next day, his sister gave him ₹ 170 as a reward. Now, how much total money will be left with him?

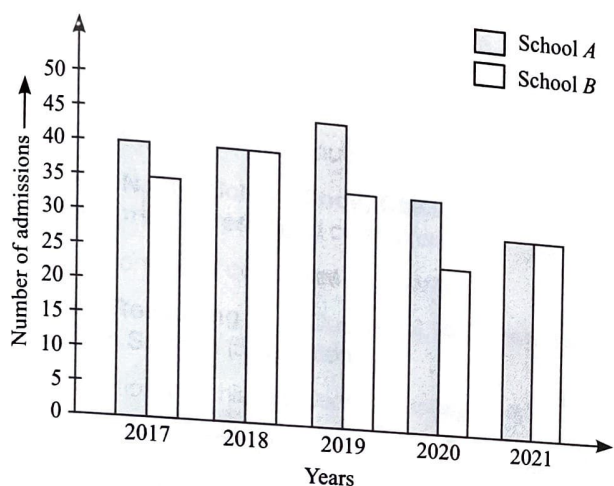
- A. ₹ 745  
B. ₹ 650  
C. ₹ 750  
D. ₹ 845

45. In an examination, the maximum marks obtained is 3 more than 5 times the minimum marks obtained. If the maximum marks obtained is 24, then form the equation which will calculate the minimum marks.

- A.  $x = 24 + 8$   
B.  $24 = 5x + 3$   
C.  $24x + 3 = 5$   
D. None of these

### ACHIEVERS SECTION

46. The given bar graph shows the number of admissions taken by schools A and B in Science stream from 2017 to 2021. Study the graph carefully and answer the following questions.



- (a) Find the average number of admissions taken by school A from year 2017 to 2021.  
(b) What is the ratio of number of admissions taken by school A to that by school B in years 2018, 2019 and 2021 altogether?

- |    | (a) | (b)     |
|----|-----|---------|
| A. | 74  | 21 : 19 |
| B. | 38  | 18 : 17 |
| C. | 71  | 18 : 17 |
| D. | 38  | 23 : 21 |

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

**Statement-I :** If  $3m - 2 = \frac{6}{5}m + 1$ , then the value of  $3m$  is 5.

**Statement-II :** A number  $m$  is 5 less than three times of the number  $n$ . If the value of  $m$  is 49, then the value of  $n$  is 16.

- 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.

48. Match the following and select the correct option.

**Column I**

**Column II**

- (P) If  $(16)^{2x+\frac{3}{2}} = (8)^{\frac{2x}{3} + \frac{19}{6}}$ , then  $x =$  \_\_\_\_\_ (i)  $\frac{1}{(3)^2}$   
(Q)  $\frac{5^2 \times 35^2 \times 9^0}{49 \times 125 \times 45} =$  \_\_\_\_\_ (ii)  $2^0 \times 2^1$   
(R)  $(-1)^4 - (-1)^5 =$  \_\_\_\_\_ (iii)  $\frac{7}{2^2 \times 3}$

- A. (P) → (iii); (Q) → (ii); (R) → (i)  
B. (P) → (ii); (Q) → (i); (R) → (iii)  
C. (P) → (iii); (Q) → (i); (R) → (ii)  
D. (P) → (i); (Q) → (ii); (R) → (iii)

49. Read the given statements carefully and state 'T' for true and 'F' for false.

- (i) In a shop, there are 1500 oranges. If 45% of the oranges are rotten, then the number of rotten oranges is 675.  
(ii) In a school, if 35% of the students are girls and 260 students are boys, then number of girls in the school is 150.  
(iii) 80% of 5 is 4.

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

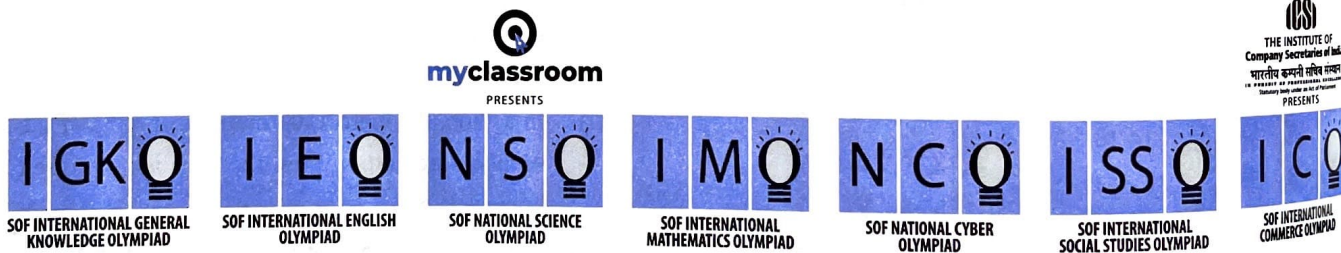
50. Answer the following questions and select the correct option.

- (a) A wire of length 352 cm is bent to form a circle. What is the area of the circle formed?
- (b) A parallelogram PQRS has two sides PQ and QR are 14 cm and 8 cm. If the height corresponding

to PQ is 4 cm, then find the height corresponding to QR.

- |    | (a)                  | (b)  |
|----|----------------------|------|
| A. | 9896 cm <sup>2</sup> | 8 cm |
| B. | 6844 cm <sup>2</sup> | 6 cm |
| C. | 6844 cm <sup>2</sup> | 8 cm |
| D. | 9856 cm <sup>2</sup> | 7 cm |

SPACE FOR ROUGH WORK



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