SCIENCE OLYMPIAD FOUNDATION

SOF INTERNATIONAL MATHEMATICS OLYMPIAD 2025-26

CLASS 9

QUESTION PAPER SET A

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 1 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: Navya purchased a hand bag for ₹ 345.50, a pair of shoes for ₹ 480.25 and a cap for ₹ 75.50. How much money did she spend in all?

   A. ₹ 901.25 B. ₹ 785.50 C. ₹ 895.75 D. ₹ 920.25

   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.:.....

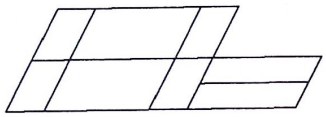
Contact No.:.....

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

1. During a Marathon race, Aditya runs 3 km towards East. He then turns right and runs 5 km and then turns left and runs 4 km. He again turns left and runs 8 km. Finally, he turns left and runs 2 km to reach the finishing point. How far and in which direction is he now from the starting point?

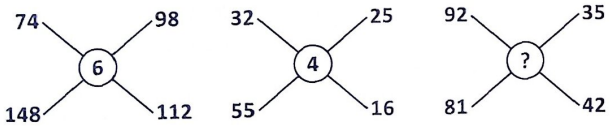
A. $5\sqrt{9}$ km, North-East
B. $\sqrt{34}$ km, South-West
C. $5\sqrt{9}$ km, South-East
D. $\sqrt{34}$ km, North-East

2. Find the number of parallelograms formed in the given figure.



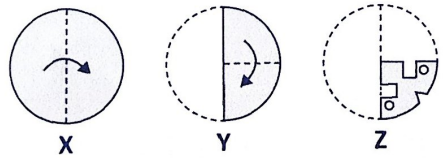
A. 20
B. 19
C. 18
D. More than 20

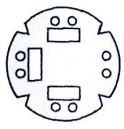
3. Find the missing number, if same rule is followed in all the three figures.

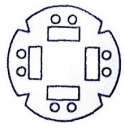


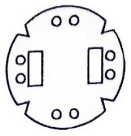
A. 7
B. 5
C. 3
D. 4

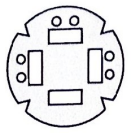
4. There is a set of three figures X, Y and Z showing a sequence of folding of a piece of paper. Fig. Z shows the manner in which the folded paper has been cut. Select a figure from the options which would most closely resembles the unfolded form of Fig Z.



A. 

B. 

C. 

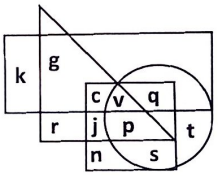
D. 

5. In the given letter series, some of the letters are missing which are given in that order as one of the options below it. Select the correct option.

b_c_aa_c_abba_bbcc

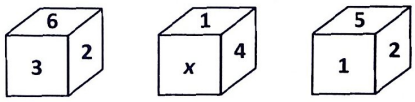
A. bccaa
B. bcaab
C. cbaca
D. acbbc

6. In the given Venn diagram, circle represents mathematicians, square represents scientists, rectangle represents men and triangle represents government employees. Which of the following letter represents women mathematicians who are scientists but not a government employee?



A. p
B. v
C. j
D. s

7. Three different positions of a cube are given below. Which of the following numbers will come in place of *x*?

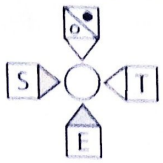


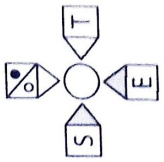
A. 5
B. 3
C. 6
D. 2

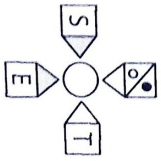
8. How many such pairs of letters are there in the word MASTERY each of which have as many letters between them in the word as in the English alphabets?

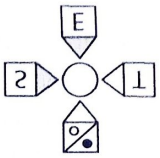
A. One
B. Two
C. Three
D. More than three

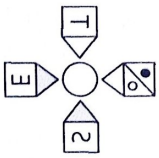
9. Select the correct water image of the given figure.



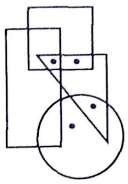
A. 

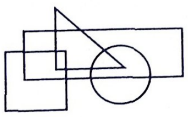
B. 

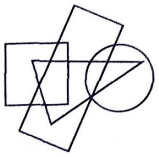
C. 

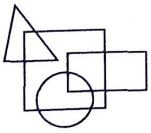
D. 

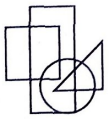
10. Which of the following options satisfies the same conditions of placement of the dots as in the given figure?



A. 

B. 

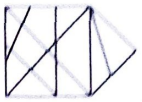
C. 

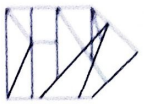
D. 

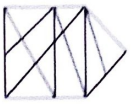
11. Seven teachers K, L, M, N, O, P and Q are sitting in a circle facing opposite to the centre of the circle. P is third to the left of L. K is fourth to the left of O. N is second to the right of P and M is sitting exactly between O and L. What is the position of Q with respect to K?

A. Third to the left
B. Second to the left
C. Fourth to the right
D. Third to the right

12. Select a figure from the options in which the given figure is not exactly embedded as one of its parts.

A. 

B. 

C. 

D. 

13. There is a certain relationship between the pair of numbers on the either side of ::. Identify the relationship of the given pair and find the missing number.

4 : 68 :: 6 : ?

A. 222
B. 234
C. 216
D. 228

14. Study the given information carefully and answer the following question.

'S + T' means 'S is the brother of T';

'S ÷ T' means 'S is the daughter of T';

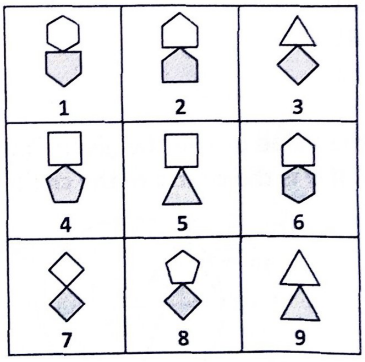
'S – T' means 'S is the father of T' and

'S × T' means 'S is the daughter-in-law of T'.

Which of the following is definitely true for the expression A – R + N ÷ P × L?

A. L is the grandfather of R.
B. P is the father of R.
C. N is the daughter of L.
D. A is the son of L.

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



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

16. If $p + q + r = 0$, then the value of $\frac{(q+r)^2}{qr} + \frac{(p+r)^2}{pr} + \frac{(p+q)^2}{pq}$ is

A. 1
B. 3
C. 2
D. 0

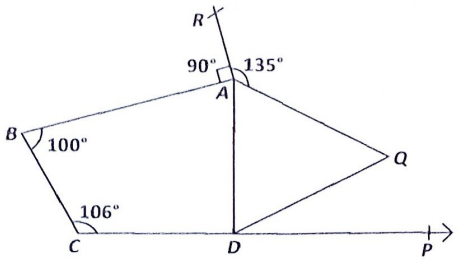
17. The ratio of volume of two spheres is 216 : 125 and the sum of their radii is 11 cm. The difference of their total surface areas is _____. (Use: $\pi = 3.14$)

A. 183.16 cm^2
B. 138.16 cm^2
C. 34.54 cm^2
D. 766.16 cm^2

18. If $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, then $\frac{x^2}{y} + \frac{y^2}{x}$ equals

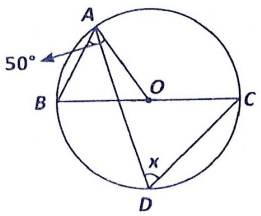
A. 76
B. 64
C. 52
D. 4

19. In the given figure (not drawn to scale), CDP is a straight line, $\triangle AQD$ is an equilateral triangle, $\angle BAR = 90°$, $\angle QAR = 135°$, $\angle BCD = 106°$ and $\angle ABC = 100°$. Then, $\angle PDQ$ equals



A. 39°
B. 21°
C. 41°
D. 53°

20. Find the value of x in the given figure (not drawn to scale), if O is the centre of the circle and $\angle OAB = 50°$.



A. 80°
B. 100°
C. 50°
D. 130°

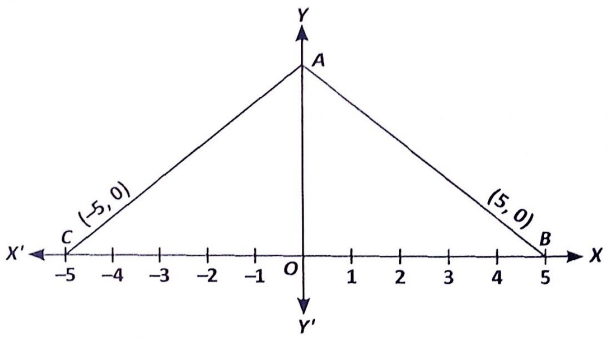
21. If $\sqrt[3]{\frac{x}{729}} + \sqrt[3]{\frac{27x}{3375}} = 1$, then find the value of x.

A. $\frac{79507}{3375}$
B. $\frac{91125}{2744}$
C. $\frac{2025}{196}$
D. $\frac{443}{125}$

22. Which of the following options is correct?

A. The bisector of the vertical angle of an isosceles triangle bisects the base at acute angles.
B. If two sides and included angle of one triangle are equal to the two sides and included angle of the other triangle, then the two triangles are congruent by ASA rule.
C. In an isosceles triangle, the angles opposite to equal sides are equal.
D. All of these

23. In the given figure (not drawn to scale), ABC is an equilateral triangle. The coordinates of vertices B and C are (5, 0) and (–5, 0) respectively. Find the coordinates of vertex A.



A. $(0, 5\sqrt{3})$
B. $(0, -25\sqrt{3})$
C. $(25\sqrt{3}, 0)$
D. None of these

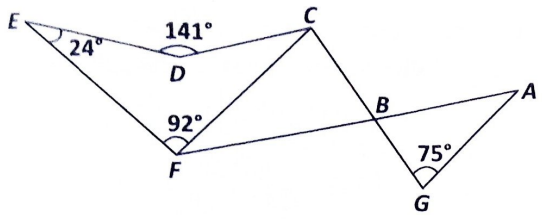
24. One of the factors of $y^2 + \frac{1}{y^2} + 2 - 2y - \frac{2}{y}$ is

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

25. Which of the following is not a Euclid's axiom?

A. The whole is greater than the part.
B. Things which are double of the same things are equal to one another.
C. Thing which are halves of the same things are equal to one another.
D. If two things are equal, then their sum is equal to $\frac{1}{3}$ of the one thing.

26. In the given figure (not drawn to scale), find the value of $\angle GCD$, if $AG \| CF$.



A. 25°
B. 75°
C. 100°
D. None of these

27. If $\frac{2.5(x-3)+3(x-4)}{1.25} = 5x - 19$, then $3x - 7 =$

A. 34
B. 10
C. 35
D. 85

28. The product of two rational numbers is $-\frac{16}{35}$. If one of the numbers is $-\frac{15}{14}$, then find the additive identity of the other number.

A. $-\frac{2}{5}$
B. 0
C. $-\frac{32}{75}$
D. $-\frac{75}{32}$

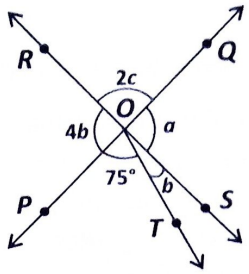
29. The point (3, 6) is the solution of the linear equation $3x - (p - 1)y = 2p - 1$. If the same point is also the solution of the linear equation $5x + (1 - 2p)y = 3q$, then find the value of q.

A. −1
B. 1
C. 0
D. 3

30. There is a 60% increase in an amount in 6 years at simple interest. What will be the compound interest of ₹ 15000 after 3 years at the same rate of interest per annum?

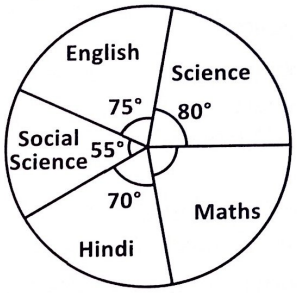
A. ₹ 3794
B. ₹ 3714
C. ₹ 4612
D. ₹ 4965

31. In the given figure (not drawn to scale), two straight lines PQ and RS intersect each other at O. If $\angle POT = 75°$, then find the values of a, b and c respectively.



A. 21°, 84°, 48°
B. 48°, 84°, 21°
C. 84°, 21°, 48°
D. 57°, 21°, 48°

DIRECTIONS (32-33) : The pie chart given below shows the marks obtained by a student in an examination. If the total marks obtained by him in the examination was 720, then answer the questions given below based on this pie chart.



32. In which of the following two subjects, did the student obtain a total of 250 marks?

A. Science, English
B. Hindi, Social Science
C. Science, Maths
D. Hindi, English

33. What percentage of total marks did he obtain in Maths?

A. $23\frac{1}{5}\%$
B. $22\frac{2}{9}\%$
C. $25\frac{1}{9}\%$
D. None of these

34. If each side of a newly formed triangle is five times the original triangle, then find the ratio of areas of new triangle formed to the original triangle.

A. 25 : 1
B. 5 : 1
C. 1 : 25
D. 1 : 5

35. Find the value of $\frac{25^{\frac{3}{2}} - 4 \times 3^0 - (16^{-\frac{3}{4}})^{-2}}{\left(\frac{27}{125}\right)^{-\frac{1}{3}} + 7^0 \times 8^0 + \frac{\sqrt{9}}{\sqrt[3]{216}}}$.

A. $\frac{-1}{15}$
B. 18
C. $\frac{3}{7}$
D. None of these

36. The number of trees in each row of a garden was equal to the total number of rows in the garden. After 111 trees have been uprooted in a storm, there remain 10914 trees in the garden. The number of rows of trees initially in the garden was

A. 100
B. 105
C. 115
D. 125

37. The sum of present ages of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be

A. 20 years
B. 18 years
C. 14 years
D. None of these

38. 12 labourers working 8 hours per day complete a piece of work in 10 days. To complete the same work in 8 days, working 15 hours a day, the number of labourers required, is

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

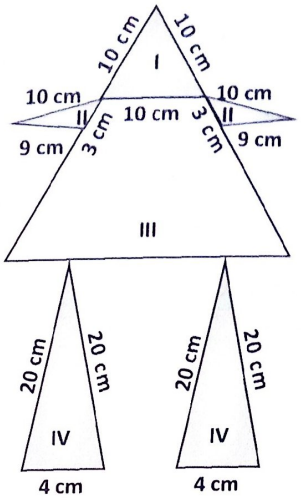
39. *A* and *B* enter into a partnership investing ₹ 16000 and ₹ 12000 respectively. After 3 months, *A* withdrew ₹ 5000 while *B* invested ₹ 5000 more. After 3 more months, *C* joins the partnership with a capital of ₹ 21000. The share of *B* exceeds that of *C*, out of a total profit of ₹ 17600 after one year by

A. ₹ 7200
B. ₹ 3600
C. ₹ 4800
D. ₹ 2400

40. The price of an article is first increased by 40% and later on price were decreased by 10% due to reduction in sales. Find the net percentage change in final price of the article.

A. 21% decrease
B. 12% increase
C. 32% decrease
D. 26% increase

41. Suman made a picture with some white paper and a single coloured paper as shown in the figure. White paper is available at her home and free of cost. The cost of coloured paper used is at the rate of 10 paise per cm^2. Find the total cost of the coloured paper used. (Take : $\sqrt{3} = 1.732$ and $\sqrt{11} = 3.32$)



A. ₹ 14.95
B. ₹ 14
C. ₹ 16
D. ₹ 13

42. Sneha bought *x* notebooks at ₹ 5.60 each and *y* pencils at 80 paise each. If the notebooks costs ₹ 15 more than the pencils, then the equation involving *x* and *y* is

A. $28x - 4y = 15$
B. $28x - 4y = 75$
C. $560x - 8y = 100$
D. $560x - 8y = 15$

43. A bag contains 50 cards each labelled with a unique number from 51 to 100. One card is picked at random. The probability that the number on the card is not a prime number, is

A. $\frac{1}{5}$
B. $\frac{3}{5}$
C. $\frac{2}{5}$
D. $\frac{4}{5}$

44. The ratio of the incomes of P and Q is 5 : 4 and the ratio of their expenditures is 3 : 2. If at the end of the year, each saves ₹ 1600, then the income of P is

A. ₹ 3400
B. ₹ 3600
C. ₹ 4000
D. ₹ 4400

45. A carpenter makes a wooden box in the shape of a cuboid. The volume of the box is given by the polynomial $V(x) = x^3 + x^2 - 12x$. Which of the following could be the possible dimensions of the box?

A. $x, (x + 3), (x - 4)$
B. $x, (x - 3), (x + 4)$
C. $x, (x - 3), (x - 4)$
D. $x^2, (x^2 + 3x), (x + 4)$

ACHIEVERS SECTION

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

(i) If abscissa of a point is two more than three times of its ordinate and ordinate of the point is -4, then the coordinates of the point is _____.

(ii) If the signs of both the coordinates of point $P(5, -4)$ are interchanged, then a point P' is obtained. So, Q (sum of abscissae of P and P', sum of ordinates of P and P') = _____.

(iii) The mirror image of the point (4, 9) along the x-axis is _____.

	(i)	(ii)	(iii)
A.	(10, 4)	(0, 1)	(4, 9)
B.	(−10, −4)	(0, 0)	(4, −9)
C.	(−4, −10)	(0, 0)	(4, −9)
D.	(−10, −4)	(−5, 4)	(−4, 9)

47. Match the following and select the correct option.

	Column-I		Column-II
P.	If 15 be the upper class limit of a frequency distribution and 10 be the mid-value of the class, then _____ is the lower class limit.	(i)	20
Q.	The range of the data 71, 18, 20, 54, 86, 65, 75, 93 is _____.	(ii)	5
R.	In a bar graph, 0.4 cm length of a bar represents 50 people. The length of bar which represents 2500 people is _____ cm.	(iii)	75

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

48. Which of the following options is incorrect?

A. A cone of radius 10 cm is filled with water. If the water poured in a cylinder of radius 15 cm, the height of the water rises 4 cm, then the height of cone is 27 cm.
B. The radius and height of a cone are in the ratio 3 : 4. If its volume is 2411.52 cm^3, then its slant height is 20 cm. (Use $\pi = 3.14$).
C. The volume of the largest sphere that can be carved out of a cube of side 7 cm is 185.76 cm^3.
D. None of these

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

(i) If $\frac{1}{x} = 2 - \sqrt{3}$, then the value of $x^3 - 2x^2 - 7x + 5$ is 5.

(ii) Square root of a positive real number is always an irrational number.

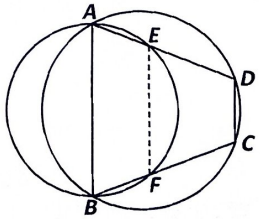
(iii) If $a = \sqrt{6 - \sqrt{11}}$ and $b = \sqrt{6 + \sqrt{11}}$, then the value of $a + b$ is $\sqrt{23}$.

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

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

Statement-I : The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, then the distance of the other chord from the centre is 3 cm.

Statement-II : In the given figure (not drawn to scale), $ABCD$ is a cyclic quadrilateral. A circle passing through A and B meets AD and BC in the points E and F respectively. Then $EF \| DC$.



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.

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK