**INSTRUCTION:** Write your Name, Class Roll No. etc. in the answersheet. Select the correct answer out of (a), (b), (c) and (d) of particular item and fill the specific rectangle ■ with blue/black ball pen denoting the correct answer. For example, if (c) is the correct answer to Q. No. X: blacken like this: Q. No. X: □ □ ■ □. Rough work is to be done on separate paper. Marks will be deducted for wrong answer. Don't waste time for answering a question which appears difficult to you, better try the next question.

**[Students of West Bengal Board will answer Group A and Group B, students reading in ICSE and CBSE board will answer Group A and Group C]**

## Group A

1.  In the adjoining figure $AB \parallel CD$, $\angle APO = 30°$ and $\angle CQO = 55°$, find $\angle POQ$.

    

    (a) 90°          (b) 85°

    s(c) 75°          (d) none of these
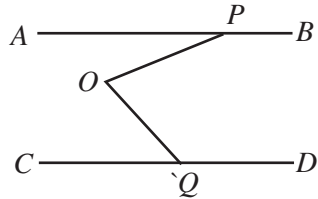
2.  The ratio of the three sides of an isosceles right angled triangle is

    (a) 1 : 1 : 2    (b) 1 : $\sqrt{2}$ : $\sqrt{2}$  (c) 1 : 1 : $\sqrt{2}$   (d) 1 : 2 : 3

3.  One angle of a triangle is 130°. The measure of the angle between the bisectors of the other two angles is

    (a) 135°          (b) 145°          (c) 55°          (d) 155°

4.  The ratio of two complementary angles is 1 : 5; the measure of the larger angle is

    (a) 60°          (b) 65°          (c) 85°          (d) 75°

5.  *ABCD* is a circle with its centre at *O*. Write the condition of congruency of the triangles *AOB* and *COD*.
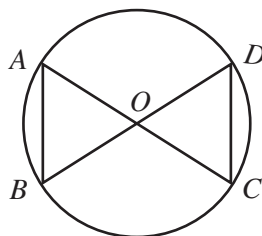


   (a) *AAS*        (b) *SSS*

   (c) *SAS*        (d) *AAA*

6.  The straight lines *AB* and *CD* intersect each other at *O*; if $\angle AOD + \angle BOC = 70°$, then $\angle AOC =$

   (a) 145°        (b) 70°        (c) 135°        (d) 110°

7.  In the $\triangle ABC$ and $\triangle DEF$, $AB = DF$, $EF = AC$ and $\angle BAC = \angle DFE$, then which one is correct?

   (a) $\angle DEF = \angle ABC$        (b) $\angle BAC = \angle EBF$

   (c) $\angle EDF = \angle ABC$        (d) none of these

8.  In the adjoining figure *ABCDE* is a pentagon. *CD* is produced both ways to *F* and *G*. $\angle ABC = \angle AED = x°$, $\angle BCF=60°$, $\angle EDG=70°$, and $\angle BAE=30°$, find *x*.
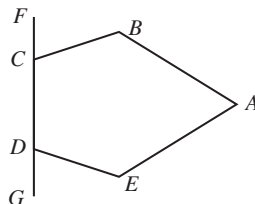


   (a) 175°        (b) 105°

   (c) 135°        (d) 140°

9.  The diagonals *AC* and *BD* of the parallelogram *ABCD* intersect at *O*. *OA* = 3 cm and *OD* = 2 cm, then the length *AC* + *BD* =

   (a) 5 cm        (b) 10 cm        (c) 12 cm        (d) 15 cm

10. The sum of an angle and 10 times its complement is 450°. The measure of the angle is—

   (a) 60°        (b) 45°        (c) 40°        (d) 50°

11. To construct a unique parallelogram the minimum number of measurements required is—

    (a) 2        (b) 3        (c) 4        (d) 5

12. The ratio of the diagonals of a rhombus is 3 : 4 and the perimeter is 40 cm, the area of the rhombus is—

    (a) 96 cm$^2$     (b) 112 cm$^2$     (c) 192 cm$^2$     (d) 168 cm$^2$

13. $ABCD$ is an isoscles trapezium in which $AB\|CD$ and $\angle BAD = 57°$. Find the value of $\angle BCD + \angle ADC$.

    (a) 123°      (b) 224°      (c) 303°      (d) 246°

14. One of the equal sides of an isosceles triangle is 13 cm and the length of the altitude drawn to the unequal side is 5 cm. The area of the triangle is

    (a) 50 cm$^2$     (b) 60 cm$^2$     (c) 38 cm$^2$     (d) 156 cm$^2$

15. $ABCD$ is a rectangle and $CD = CP\backslash AC$ and $DP$ are joined. $AC$ intersects $DP$ at $O$ and $\angle BAC = 50°$, The measure of $\angle AOD$ is—

    (a) 100°

    (b) 135°

    (c) 95°

    (d) 130°
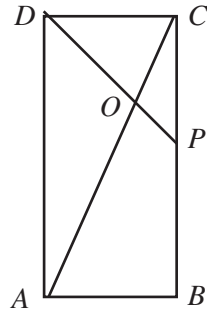
16. $ABC$ is an equilateral triangle, $D$, $E$, $F$ are the mid-points of $AB$, $BC$, $AC$ respectively then the quadrilateral $BEFD$ is a—

    (a) square     (b) rhombus     (c) rectangle     (d) kite

17. The area of a rectangle is $A$ cm$^2$ and its length is x cm, find its perimeter.

(a) $\frac{1}{2}\left(\frac{x^2 + A}{x}\right)$ cm

(b) $2\left(\frac{A + x^2}{x}\right)$ cm

(c) $2(A + x)$ cm

(d) $\frac{A + x^2}{2x}$ cm

18. The angle $A$, $B$, $C$, $D$ of a quadrilateral $ABCD$ taken in order are in the ratio $3 : 7 : 6 : 4$; then $ABCD$ is a

(a) square     (b) rectangle     (c) trapezium     (d) kite

19. The supplementary angle of $1°$ is—

(a) $89°$       (b) $179°$       (c) $199°$       (d) $99°$

20. In a regular polygon all the sides are produced in order, if each exterior angle measures $22.5°$ then the numebr of sides of the polygon is—

(a) 8       (b) 16       (c) 20       (d) 32

21. If $x^6 + 64y^6 \equiv (Ax^2 + By^2)(Cx^4 + Dx^2y^2 + Ey^4)$ then

$A + B + C + D + E =$

(a) 21       (b) 18       (c) 26       (d) 20

22. If $p = 2 - a$ then the value of $a^3 + 6ap + p^3 - 8 =$

(a) 4       (b) $- 4$       (c) 2       (d) 0

23. $\left[\dfrac{1}{(x+3)(x+4)} + \dfrac{1}{x^2 + 5x + 6}\right] - \dfrac{2}{x^2 - 4} =$

(a) $\dfrac{12}{(x+2)(x-2)(x+4)}$

(b) $\dfrac{-12}{(x+2)(x-2)(x+4)}$

(c) $\dfrac{1}{(x-2)(x+2)(x+4)}$

(d) $\dfrac{6}{(x^2-4)(x+4)}$

24. One factor of $(25x^2 - 1) + (1 + 5x)^2$ is

    (a) $5x + 1$      (b) $5x - 1$      (c) $5x^2 - 1$      (d) $5x^2 + 1$

25. The co-efficient of $x$ in $(x + 3)^3$ is—

    (a) 9            (b) 27            (c) 3            (d) 1

26. If $p$ and $q$ are in direct proportion then

    (a) $\dfrac{1}{p}$ and $\dfrac{1}{q}$ inverse proportion

    (b) $\dfrac{1}{p}$ and $\dfrac{1}{q}$ are in direct proportion

    (c) $p + q$ is constant

    (d) $\dfrac{p}{q}$ is constant

27. If $(6x)^6 = 6^8$ then $x =$

    (a) $6^3$            (b) $6^4$            (c) $\sqrt[4]{6}$            (d) $\sqrt[3]{6}$

28. If $\dfrac{x - 2}{3} + \dfrac{x + 3}{4} = \dfrac{x + 4}{5} + 15$ then $x =$

    (a) 47            (b) 31            (c) 41            (d) 39

29. If $a^3 + b^3 + c^3 - 3abc$ is divided by $(a + b + c)$ then the quotient is—

    (a) $a^2 + b^2 + c^2 - 2ab - 2bc - 2ca$

    (b) $a + b + c$

    (c) $a^2 + b^2 + c^2 - bc - ca - ab$

    (d) $a^2 + b^2 + c^2$

30. Three numbers are in the ratio $5 : 6 : 7$. The sum of their cubes is 18468. The largest among these numbers is—

    (a) 27            (b) 18            (c) 63            (d) 21

31. If $\frac{x^2}{x} = 1$, then the value of $x$ is

(a) 1 or $-1$    (b) 1    (c) 0, 1    (d) 0

32. If $12x^4 + 5x^3 - 33x^2 - 3x + 16$ is divided by $4x^2 - x - 5$, the remainder is

(a) $3x + 4$    (b) $4x + 3$

(c) $x - 4$    (d) $3x - 4$

33. Find $x$ and $y$ satisfying $\sqrt{x} + y = 7$ and $x + \sqrt{y} = 11$

(a) $x = 9, y = 64$    (b) $x = 16, y = 9$

(c) $x = 9, y = 4$    (d) $x = 16, y = 3$

34. If $7^{5x-8} \times 5^{x+2} = 30625$, then the value of $x$ is—

(a) 1    (b) 2    (c) 3    (d) 4

35. The length of a rectangle is $(3x - 4y + 6z)$ cm  and perimeter is $(7x + 8y + 17z)$ cm, find the breadth of the rectangle

(a) $(x + 16y + 5z)$ cm    (b) $\left(\frac{x}{2} - 8y - \frac{5}{2}z\right)$ cm

(c) $\frac{1}{2}(x - 16y + 5z)$ cm    (d) $\frac{1}{2}(x + 16y + 5z)$ cm

36. Find the solution set of the equation $x^2 + \frac{25}{x^2} = 26$

(a) $\{1, 5\}$    (b) $\{-5, -1, 1, 5 \}$

(c) $\{0, 1, 5\}$    (d) $\{-5, -1\}$

37. Simplify : $\left[\dfrac{x}{x+y} + \dfrac{y}{x-y}\right] \div \left[\dfrac{x}{x-y} - \dfrac{y}{x+y}\right]$

(a) 0    (b) 1    (c) $-1$    (d) $xy$

38. The monthly incomes of $A$ and $B$ are in the ratio 4 : 3 and their monthly expenditures are in the ratio 2 : 1. If each saves Rs. 1000 per month, find their monthly incomes.

(a) Income of $A$ = Rs. 1000, Income of $B$ = Rs. 1200

(b) Income of $A$ = Rs. 1500, Income of $B$ = Rs. 2000

(c) Income of $A$ = Rs. 4000, Income of $B$ = Rs. 3000

(d) Income of $A$ = Rs. 2000, Income of $B$ = Rs. 1500

39. If $x = p - 2$ and $\dfrac{x}{p} - \dfrac{x+1}{p} = 1$, find $x + p$.

(a) 4        (b) $-4$        (c) $-2$        (d) $-6$

40. One number is greater by 3 than twice another number and 6-times the smaller number exceeds the greater by 5. The smaller number is—

(a) 2        (b) 7        (c) 5        (d) 4

41. The product of the LCM and HCF of $\dfrac{4}{5}$, $\dfrac{6}{7}$ and $\dfrac{7}{9}$ is

(a) $\dfrac{4}{15}$        (b) $\dfrac{5}{7}$        (c) $\dfrac{3}{7}$        (d) $\dfrac{4}{5}$

42. The unit digit of $(136)^n$, where $n$ is a natural number is

(a) 1        (b) 8        (c) 9        (d) 6

43. By what percent is the sum of Rs. 100 is more than the sum of Rs. 90 ?

(a) 11%        (b) $10\dfrac{1}{9}$%        (c) $11\dfrac{1}{9}$%        (d) 10%

44. What per cent of 3.6 km is 360 m?

(a) 10%        (b) 50%        (c) 1%        (d) 20%

45. The length, breadth and height of a room are 6 m, 5 m and 4 m respectively. The area of the four walls of the room is—

(a) 44 m²                   (b) 176 m²

(c) 88 m²                   (d) 240 m²

46. The length of one diaginal of a square is $1\frac{1}{2}$ m. the area of the square is

(a) 1.25 m²               (b) 1.125 m²

(c) 2.25 m²               (d) 2.125 m²

47. Find the volume of a cubical box whose surface area is 486 cm².

(a) 729 cm³             (b) 81 cm³

(c) 27 cm³              (d) 486 cm³

48. In how much time will a sum become double of itself at 15% per annum simple interest.

(a) 6 yrs                 (b) $6\frac{1}{2}$ yrs

(c) $6\frac{2}{3}$ yrs               (d) 7 yrs

49. A ladder of length 10 m rests against a vertical wall with its foot 6 m away from the wall. Find how high up the wall it reaches.

(a) $2\sqrt{15}$ m            (b) 8 m

(c) 9 m                  (d) 6.5 m

50. What sum of money will amount to Rs. 4230 in $2\frac{1}{2}$ year at 7% per annum simple interest?

    (a) Rs. 4600                    (b) Rs. 3400

    (c) Rs. 3200                    (d) Rs. 3600

51. Express the ratio 17 : 20 as percentage.

    (a) 85%                         (b) $42\frac{1}{2}$%

    (c) 68%                         (d) none of these

52. If $1^2 + 2^2 + 3^2 + \ldots \ldots + 512^2 = m$, then $2^2 + 4^2 + 6^2 + \ldots \ldots$ $1024^2$ is equal to—

    (a) 3 m                         (b) 4 m

    (c) $m^2$                       (d) $m^3$

53. Sudip buys an article for Rs. 80 and marks it at Rs. 120. He then allows a discount of 40%. What is the loss or gain per cent.

    (a) 12% gain                    (b) 12% loss

    (c) 10% gain                    (d) 10% loss

54. The average of the squares of the first 10 natural numbers is

    (a) 38.5                        (b) 40

    (c) 47.5                        (d) 50

55. The difference of 4 square metre and 4 metre square is

    (a) 0          (b) 4 m²          (c) 16 m²          (d) 12 m²

56. I bought a book after giving a discount of 20% on the marked price and was sold making a profit of 20% on the marked price. Find the percentage of profit.

(a) 40%                    (b) 30%

(c) 50%                    (d) 45%

57. A sum of Rs. 6000 amounts to Rs. 6900 in 3 years. What will it amount to if the rate of interest is increased by 2%.

(a) Rs. 7260               (b) Rs. 7110

(c) Rs. 7320               (d) none of these

58. What is the heighest power of 5 that divides

$10 \times 20 \times 30 \times 40 \times 50 \times 60 \times 70 \times 80 \times 90 \times 100$.

(a) 10                     (b) 12
(c) 13                     (d) 14

59. The sum of two rational numbers is −1, if one of them be $-\frac{5}{4}$ then the other is—

(a) $\frac{1}{4}$     (b) $-\frac{9}{4}$     (c) $\frac{5}{4}$     (d) $\frac{3}{4}$

60. Increase the number 60 by 60%. The new number is—

(a) 90                     (b) 99

(c) 96                     (d) 120

61. If $\sqrt{2025} + \sqrt{0.0612 + x} = 45.25$, find the value of $x$.

(a) 0.013                  (b) 0.0013

(c) 0.016                  (d) 0.13

62. The value of $\sqrt{\dfrac{3+\sqrt{5}}{3-\sqrt{5}}}$ correct to two places of decimal.

    (a) 2.62                     (b) 2.60

    (c) 2.63                     (d) 2.64

63. $\left(1+\dfrac{1}{x}\right)\left(1+\dfrac{1}{x+1}\right)\left(1+\dfrac{1}{x+2}\right)\cdots \cdots\left(1+\dfrac{1}{x+n}\right)=$

    (a) $x + n + 1$             (b) $1 + \dfrac{1}{x+n+1}$

    (c) $\dfrac{x+n}{x}$                (d) $\dfrac{x+n+1}{x}$

64. The value of $\dfrac{(0.796)^2-(0.204)^2}{(0.796-0.204)}=$

    (a) 0.5                      (b) 1

    (c) 0.592                   (d) 0.408

65. The base of an isosceles triangle is 10 cm and one of its equal sides is 13 cm. The area of the triangle is

    (a) 120 cm²             (b) 65 cm²

    (c) 60 cm²               (d) 32.5 cm²

66. $\dfrac{1}{x+1}-\dfrac{1}{x-1}-\dfrac{x^2}{x+1}+\dfrac{x^2}{x-1}=$

    (a) 0                      (b) 1

    (c) 2          (d) $-2$

67. Solve for $t$ : $\dfrac{t+2}{3} + \dfrac{1}{t+1} = \dfrac{t+3}{2} - \dfrac{t-1}{6}$

    (a) 1         (b) 2         (c) –2         (d) –1

68. When $N$ is divided by 4, the remainder is 3. What is the remainder when $2N$ is divided by 4.

    (a) 3         (b) 2         (c) 4         (d) 6

69. The unit digit of the number $(515)^{31} + (525)^{90} + (526)^{36}$ is

    (a) 5         (b) 0         (c) 1         (d) 6

70. If $\dfrac{2x}{1+\dfrac{1}{1+\dfrac{x}{1-x}}} = 1$ then the value of $x$ is

    (a) 2         (b) 3         (c) $\dfrac{2}{3}$         (d) $\dfrac{3}{2}$

## Group -B

### [For students under West Bengal Board]

71. If $a + \dfrac{1}{a} = 4$, then the value of $a^2 - \dfrac{1}{a^2}$ is

    (given $a - \dfrac{1}{a} = $ +ive)

    (a) $8\sqrt{3}$         (b) $2\sqrt{3}$         (c) 12         (d) $4\sqrt{3}$

72. $a$, $b$, $c$, $d$ and $e$ are five consecutive even numbers and the average of these even numbers is 82. The product of $c$ and $e$ is—

    (a) 6720                 (b) 7224

    (c) 7062                 (d) 7052

73. If x : y = 7 : 3, then the value of $(xy + y^2) : (x^2 - y^2)$ is

    (a) 10 : 3    (b) 4 : 3    (c) 3 : 4    (d) 1 : 3

74. A man in a train notices that he can count 21 telephone posts in one minute. If they are known to be 50 m apart, then the speed of the train was

    (a) 55 km/hr             (b) 60 km/hr

    (c) 65 km/hr             (d) 72 km/hr

75. *A* lent Rs. 600 to *B* and some amount to *C* at the rate of $8\frac{1}{3}$ % per annum simple interest. After 5 years he got the total interest of Rs. 400 from *B* and *C* together. The amount of money lent by *A* to *C* was

    (a) Rs. 360             (b) Rs. 300

    (c) Rs. 400             (d) Rs 420

76. If $2^x + 2^x + 2^x = 192$. then $x =$

    (a) 5    (b) 6    (c) $\frac{1}{5}$    (d) 10

77. If $28^2$ is added to the square of a number the sum so obtained is 1808, find the number

    (a) 36    (b) 26    (c) 42    (d) 32

78. In the adjoining figure $\angle BAD = a$, $\angle ABC = c$ and $\angle BCD = b$. find $\angle ADC$

    (a) $b - a + c$    (b) $b - a - c$

    (c) $a + b - c$    (d) $a + b + c$
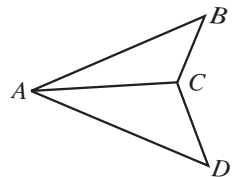
79. *ABCD* is an isosceles trapezium with ∠*BAD* = 115°, find the measure of ∠*BCD*.

   (a) 115°          (b) 105°          (c) 75°          (d) 65°

80. The ratio of an interior angle to an exterior angle of a regular polygon is 5 : 2, then the number of sides of the polygon is
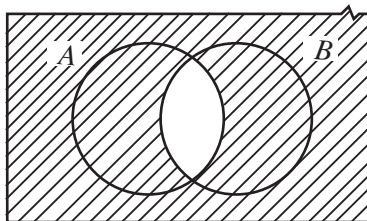
   (a) 13          (b) 11          (c) 7          (d) 9

## GROUP-C

### [For the students reading in ICSE or CBSE syllabus]

71. Given the function $g(x) = 2x - 3$, $x \in \{-1, 0, 1\}$, find x when $g(x) = -5$.

   (a) −1          (b) 1          (c) 0          (d) −2

72. The set representd by the unshaded region is

   (a) $A' \cap B'$

   (b) $(A \cup B)'$

   (c) $A - B$

   (d) $A' \cup B'$



73. In a certan examination, 35 students failed in Mathematics, 40 in Physics and 40 in chemistry, 20 failed in Mathematics and Physics. 17 failed in Physics and Chemistry, 15 failed in Mathematics and Chemistry and 5 failed in all the three subjects. If 200 students appeared in the examination, how many of them did not fail in any subject?

   (a) 68          (b) 140          (c) 132          (d) none of these

Class-VIII-(14)

74. A mother is 21 years older than her daughter . 14 years hence she will be twice as old as her daughter. Find the present age of the mother.

(a) 35 yrs                    (b) 28 yrs

(c) 42 yrs                    (d) 32 yrs

75. $ABC$ is a triangle $P$, $Q$, $R$ are the mid-points of $BC$, $CA$ and $AB$ respectively. If $PQ = 6$ cm, $QR = 7$ cm, $RP = 8$ cm, Find the perimeter of the $\triangle ABC$.

(a) 42 cm                  (b) 21 cm

(c) 63 cm                  (d) 84 cm

76. Which of the following capital letters $A$, $B$, $C$, $D$, $E$, $F$, $H$ have symmetry about the vertical axis—

(a) $A$, $H$                  (b) $A$, $E$, $B$

(c) $A$, $C$ $D$               (d) $H$

77. $ABC$ is a triangle, $P$, $Q$, $R$ are the mid-points of $AB$, $AC$ and $BC$ respectively. If $\angle APR = 75°$ and $\angle QPR = 35°$, find $\angle PAR$.

(a) 55°                     (b) 40°

(c) 60°                     (d) 52.5°

78. In the adjoining figure $ABCD$ is a square and $\triangle DEC$ is an equilateral triangle, then $\angle DAE =$

(a) 30°                     (b) 15°

(c) $22\frac{1}{2}°$                (d) 45°
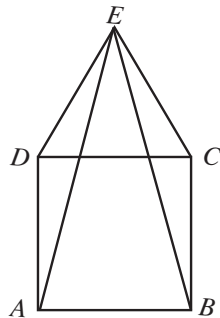
79. The Ramanujan's number is

    (a) 1728                        (b) 1792

    (c) 1727                        (d) 1729

80. The point $P(a, b)$ is first reflected in the $x$-axis and then reflected in the $y$-axis to $P'$. If the co-ordinates of $P'$ are $(-4, 5)$ then evaluate $a$ and $b$.

    (a) $a = 4, b = 5$              (b) $a = -4. b = -5$

    (c) $a = 4. b = -5$            (d) $a = -4, b = 5$

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