Roll No. | | | | | | |

A

- Please check that this questionnaire contains 11 printed pages.
- Code A, B or C given on the right hand top corner of the questionnaire should be written on the answer sheet in the space provided.
- Please check that this questionnaire contains 60 questions.

28th ARYABHATTA INTER-SCHOOL MATHEMATICS COMPETITION – 2011

CLASS - VIII

Time Allowed: 2 Hours   Max. Marks: 100

GENERAL INSTRUCTIONS:

1. Do not write your name on the questionnaire.
2. Write your roll no. on each page of the questionnaire and the Answer Sheet in the space provided.
3. All the questions are compulsory.
4. Read questions carefully; think twice before you write the answer. **No overwriting or cutting is allowed on the Answer Sheet.** Another copy of the questionnaire or answer sheet will not be provided.
5. Do your rough work in the space provided in the questionnaire.
6. The questionnaire contains four sections. Section A contains 10 questions on Logical Reasoning of 1mark each, Section B contains 20 Multiple Choice Questions of 1 mark each, Section C contains 20 Free Response Type Questions of 2 marks each and Section D contains 10 Free Response Type Questions of 3 marks each.
7. No working or descriptive answers of any question is to be given. Only the Answers are to be written on the Separate Answer sheet provided to you.
8. Use Blue or Black pens to write the answer on the Answer Sheet.
9. Answers should be clearly written in the space provided on the Answer sheet.
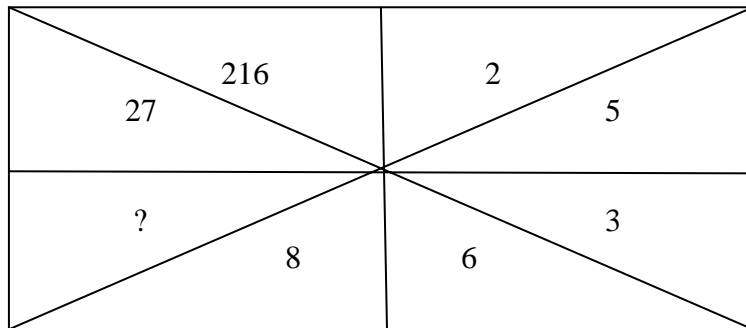10. Use of calculator is not allowed.

SECTION –A

Write the correct option in the Answer Sheet.

1. Find the missing number in the series: 2, 4, 5, 15, 17, 68, 71, 355, 359, _____.
   a) 445
   b) 2345
   c) 2154
   d) 1795

2. In the following questions, the numbers have been arranged according to a pattern. Find the pattern and fill the missing number.


	4			9			4	
81	270	25	49	672	16	36	?	64
	9			64			81	

   a) 864
   b) 624
   c) 215
   d) 179
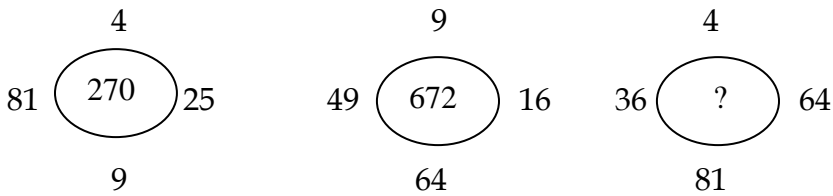
3. Observe the pattern and find the number to fill the blank :

   a) 25
   b) 125
   c) 215
   d) 625

4. If K = 11 and KAMAL = 38, then PRIZE = _____.
   a) 76
   b) 78
   c) 72
   d) 74

5. What is the angle between the minute hand and the hour hand of a clock at 15 minutes past 7?
   a) 72.5°
   b) 67.5°
   c) 127.5°
   d) 120°

6. If MACHINE is coded as 197914152011, how will you code DANGER?
   a) 10720131124
   b) 10930131124
   c) 10720120124
   d) 10820112054

7. Observe the pattern and fill in the blank space .
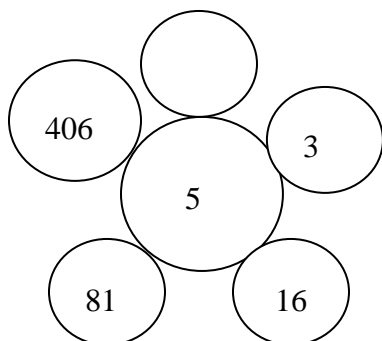
   a) 125
   b) 2031
   c) 4035
   d) 6250

8. A, B, C, D, E, F, G and H are the family members. B is the sister of G and G is the brother of C. E is the wife of A, whose father is H. D is the husband of B and F is the son of G. A is the father of B. How 'F' is related to 'E'?
   a) Son
   b) Grandson
   c) Father
   d) Brother

9. Solve the following questions if the symbols are as given below :

×	=	-
+	=	÷
÷	=	×
-	=	+

Then 40 ÷ 20 + 10 x 2 – 14 = _____.
a) 96
b) 94
c) 92
d) 102

10. Five poles are standing in a row. M is on the left of N, O is on the right of P which is on the right of N. If L is on the left of M, which pole is in the centre?
a) M
b) N
c) O
d) P

SECTION - B

Write the correct option in the Answer Sheet.

11. Ankit goes straight 6 km eastwards, then turns right and goes straight 2 km and turns right again and goes straight 8 km. In which direction is he from the starting point?
a) North-East
b) North-West
c) South-East
d) South-West

12. If $5^a \times 5^b = \dfrac{5^c}{5^d}$, what is d in terms of a, b and c?

a) $\dfrac{c}{ab}$
b) $c-a-b$
c) $a+b-c$
d) $c-ab$

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13. If the perimeter of a semicircular protractor is 36cm, its diameter is :
    a) 10cm
    b) 12cm
    c) 15cm
    d) 14cm

14. A purchased 4 chairs and 3 tables for Rs. 1650. B purchased 3 chairs and 2 tables for Rs. 1150. The cost per chair is :
    a) Rs. 150
    b) Rs. 125
    c) Rs. 185
    d) Rs. 140

15. If the height of a cone is halved and its radius is doubled , then its volume is increased by :
    a) 100%
    b) 200%
    c) 300%
    d) 400%

16. An equilateral triangle is formed on a diagonal of a square of side '*a*'cm. The area of the triangle is :

    a) $\dfrac{\sqrt{3}}{2}a^2$ cm²
    b) $\dfrac{\sqrt{3}}{4}a^2$ cm²
    c) $\sqrt{3}a^2$ cm²
    d) a^2 cm²

17. If 0<*a*<*b*<1 , which of the following is (are) true:

    I. *a*–*b* is negative   II. $\dfrac{1}{ab}$ is positive III. $\dfrac{1}{b} - \dfrac{1}{a}$ is positive

    a) I only
    b) II only
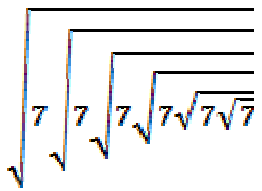   c) I and III only
    d) I and II only

Rough Work

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18. In a quadrilateral ABCD, AB ☐ CD and AD=BC=7cm. If
    $\angle$A = 70º, then the measure of $\angle$C is :
    a) 70º
    b) 100º
    c) 80º
    d) 110º

19. A triangle and a trapezium are equal in area. They also have
    the same altitudes. If the base of the triangle is 36 cm, the
    mean of the parallel sides of the trapezium is :
    a) 72cm
    b) 9 cm
    c) 18 cm
    d) 36 cm

20. The maximum number of points of intersection of 8 lines is:
    a) 30
    b) 28
    c) 25
    d) 32

21. If $\triangle$ABC and $\triangle$DEF are similar triangles such that $\angle$A = 47º
    and $\angle$E = 83º , Then $\angle$C is :
    a) 50º
    b) 60º
    c) 70º
    d) 80º

22. The minute hand of a wall clock is of the length 10.5cm. The
    area covered by it in 1 hour is :
    a) 346.5 cm²
    b) 348.5 cm²
    c) 300.5 cm²
    d) 350 cm²

23. The unit digit in (7^{27} - 3^{14}) is :
    a) 0
    b) 7
    c) 4
    d) 6

Rough Work

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24. When n is divided by 4, the remainder is 3. What is the remainder when $2n$ is divided by 4?
    a) 0
    b) 2
    c) 6
    d) 3

25. If $\dfrac{1}{a} + \dfrac{1}{b} = \dfrac{1}{c}$ and $ab = c$, then the average of a and b is :

    a) 1
    b) 0
    c) $\dfrac{1}{2}$
    d) $\dfrac{c}{2}$

26. 9 men visited a hotel, 8 of them spent Rs.4 each over their meal and the 9th spent Rs. 2 more than the average of all the nine. The total money spent by them on the meal is :
    a) Rs. 38.25
    b) Rs. 40
    c) Rs. 38
    d) Rs. 38.50

27. Of the three numbers, the first is twice the second and is half the third. If the average of three numbers is 56 , the three numbers in order are :
    a) 48,24,96
    b) 48,36,96
    c) 48,12,14
    d) 24,12,48

28. The circumradius of a triangle whose sides are 6cm, 8 cm and 10 cm is :
   a) 3cm
    b) 4cm
    c) 5cm
    d) 7cm

Rough Work

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29. If *a, b, c, d* and *e* are five consecutive odd integers , then their mean is :
    a) *a* +4
    b) 5(*a+b+c+d+e*)
    c) $\dfrac{abcde}{5}$
    d) *a* + 5

30. $\sqrt{7\sqrt{7\sqrt{7\sqrt{7\sqrt{7\sqrt{7}}}}}}$ is equal to :

    a) 0
    b) 7
   c) $7^{63/64}$
    d) $7^{31/32}$

SECTION – C

Write only the answers of the following questions in the Answer Sheet.

31. Express $0.34676767\ldots$ + 0.1333…. as vulgar fraction.

32. The sum of a two digit number and the number obtained by interchanging the digits of the number is 121. If the digits of the number differ by 5 , then find the number.

33. P and Q can do a piece of work in 12 days. Q and R in 15 days, R and P in 20 days. In how many days R alone can do the same work?

34. In the figure , AB ⊓ CD ⊓ EF , PQ ⊓ RS . ∠RQD = 25° and ∠CQP = 60°, find ∠QRS .
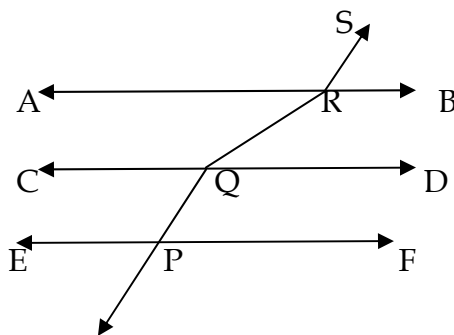
35. In the figure, $\angle A = 60^\circ$, $\angle ABC = 80^\circ$. Find the value of $\angle BQC$.
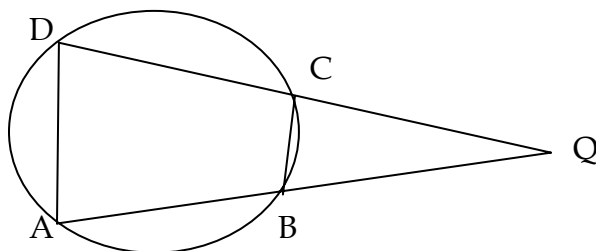
36. Two cylinders of same volume have their heights in the ratio 1 : 3. Find the ratio of their radii.

37. Find the number of spherical bullets, each 0.6cm in diameter be made out of a rectangular solid 9cm x 11 cm x 12 cm.

38. The largest sphere is cut off from a cube of diagonal $5\sqrt{3}$ cm. Find the volume of the sphere.

39. In the figure, find a.
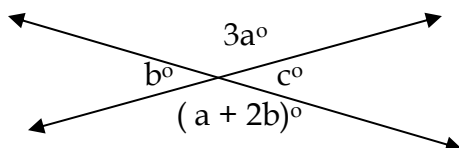
40. A cylindrical vessel 60cm in diameter is partially filled with water. A sphere 60cm in diameter is gently dropped into the vessel. To what height will water rise in the cylinder?

41. If I drive at a speed of 24 kmph, I reach school 5 minutes late and if I drive at 30kmph , I reach 4 minutes too soon. Find the distance of the school from my residence.

42. A chord of a circle is 12cm in length and its distance from the centre is 8cm. Find the length of the chord of the same circle whose distance from the centre is 6cm.

43. A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle BEC = 132^\circ$ and $\angle ECD = 37^\circ$, then find $\angle BAC$.

44. How many integers are there between 100 and 1000 all of whose digits are odd?

45. If $a^m \times a^n = a^{mn}$, then find $m(n-2) + n(m-2)$.

46. What is the area of a circle that is inscribed in a square of area 4 sq cm? (Write the answer in terms of π).

47. If $(x - a)$ is a factor of $x^6 - ax^5 + x^4 - ax^3 + 3x - a + 2$, then find the value of a.

48. The average age of eleven-member cricket team reduces by 2 years when two players of ages 30 years and 32 years leave the team and two new players of equal age join it. Find the age of each of the new comer.

49. The following observations have been arranged in the ascending order. If the median of the data 29, 32, 48, 50, x, x+2, 72, 78, 84 and 95 is the mean of 75, 64, 136, 25, 15, then find the value of x.

50. Find the square root of $\sqrt{\dfrac{3}{7}}$ upto 2 places of decimal.

SECTION -D

Write only the answers of the following questions in the Answer Sheet.

51. If line a $\parallel$ b and $\angle R = 90^\circ$. $x : y = 3 : 2$ and $y + z = 100^\circ$, then find the value of s.
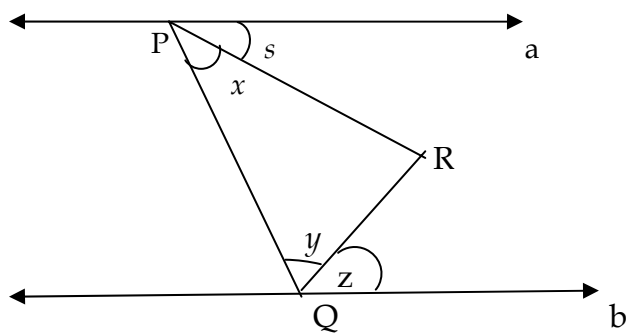
52. A hemispherical bowl is made of steel of 0.25cm thickness. The inner radius of the bowl is 5cm. Find the volume of the steel used.

53. One vertex of a rhombus lies on the centre of the circle and the rest of the vertices are on the circle. If the area of the rhombus is $32\sqrt{3}$ cm², find the longer diagonal of the rhombus.

54. In the figure PQRS is a square and SRT is an equilateral triangle. Then find ∠TQR.
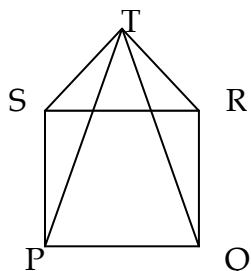
55. Three numbers are in the ratio 2 : 3 : 4 and the sum of their cubes is 0.334125. Find the largest number.

56. Find the area of an isosceles triangle having base a cm and one side b cm.

57. The compound interest on a certain sum of money for 2 years at 5% per annum is Rs102.50. Find the compound interest on the same sum for the same period at 4% per annum.

58. A train travelling with a constant speed crosses a 96m long platform in 12 seconds and another 141 m long platform in 15 seconds. Find the length of the train.

59. If $2^x = 4^y = 8^z$ and $\dfrac{1}{2x} + \dfrac{1}{4y} + \dfrac{1}{6z} = \dfrac{12}{5}$, find the value of z.

60. A shopkeeper makes a profit of 20% even after giving a discount of 10% on the advertised price of a printer. If he makes a profit of Rs. 450, find the advertised price.

Rough Work

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