## Aryabhatta Inter School Maths Competition-2003

### Class-VIII

Time Allowed: 2½ Hours

Max. Marks: 100

**General Instruction:** *As given in Aryabhatta Inter-School Maths Competition - 2002*

## PART I

**Ans. to Questions Nos. 1, 2 and 3 are to be given in the space provided in the question.**

**Q.1.** State whether true or false :

$(1 \times 10 = 10)$

(i) If $x \star y = \sqrt{x(y+1)}$ then $4 \star 15 = 8$. ........................

(ii) An altitude of a triangle is a line segment passing through one vertex and perpendicular to the opposite side. ........................

(iii) Difference of the squares of two odd natural numbers is always even ........................

(iv) $3^{-2} + 2^{-2} = 5^{-2}$ ........................

(v) The product of sum and difference of two numbers is the difference between their squares ........................

(vi) If the radius of a sphere is doubled, its volume will become 4 times ........................

(vii) If a transversal intersects two lines and the bisectors of one pair of alternate interior angles are parallel, then lines are not parallel ........................

(viii) The angle that an arc subtends at the centre is equal to the angle it subtends at any point on the remaining part of the circle ........................

(ix) The circumcentre and the incentre of a triangle coincides if the triangle is scalene ........................

(x) The H.C.F. of two numbers is 1, then their L.C.M. is the product of the number. ........................

**Q.2.** Fill in the blanks :

(i) 10 % of 20 % of x is 50, then x = ........................

$(1 \times 10 = 10)$

(ii) $1 + \dfrac{1}{2} + \dfrac{1}{3} + \dfrac{1}{4} =$ ........................

(iii) 2.5 ares = ........................ $M^2$

(iv) A man sold his watch for Rs. 75 and got a percentage of profit equal to the cost price. The cost price of watch is ........................

(v) A triangle ABC is inscribed in a cirlce. If m $\overparen{AB} = 110°$ and m $\overparen{BC} = 160°$, then $\angle B$ is ........................

(vi) Two parallel lines are intersected by a transversal and one pair of cointerior angles is $(2x - 40)°$ and $(3x + 10°)$ then x is ........................

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(vii) In a circle of radius 13 cm, a chord is drawn at a distance of 12 cm from the centre. Length of the chord is
...........................................

(viii) If circumference of a circle is 7.7 m, then its radius is ...........................................

(ix) The diameter of a sphere is 10 cm. Its surface area is ...........................................

(x) The data arranged in ascending order is called ...........................................

**Q.3.** Tick ($\checkmark$) against the correct answer: $(1 \times 10 = 10)$

(i) The product of two number is 168 and their difference is 2. Their sum is
(a) 39      (b) 36      (c) 26      (d) 29

(ii) If $A : B = B : C = C : D = 3 : 5$ and $A = 27$. Then D is
(a) 45      (b) 60      (c) 75      (d) 125

(iii) The sum of the squares of two numbers is 306 and the ratio of the numbers is 3 : 5. The greater of the number is
(a) 10      (b) 45      (c) 20      (d) 25

(iv) If the number 934$\star$652 is divisible by11. Then missing digit $\star$ is
(a) 5      (b) 4      (c) 3      (d) 2

(v) When 60 % of a number is added to 60, the result is number itself. The number is
(a) 80      (b) 120      (c) 140      (d) 150

(vi) The perimeters of two square fields are 96 metres and 28 metres respectively. The perimeter of the third square field whose area is the sum of the areas of the (above) two square fields is
(a) 90 m      (b) 92 m      (c) 96 m      (d) 100 m

(vii) The least possible number which must be added to 10500 to make it a perfect square is
(a) 49      (b) 69      (c) 89      (d) 109

(viii) If 1 is added to both numerator and denominator of a fraction, it becomes 4/5 and if 5 is subtracted from both numerator and denominator it becomes. 1/2 the fraction is
(a) 6/7      (b) 7/9      (c) 3/4      (d) 5/6

(ix) How many days will there be from 26th January, 1988 to 15th may 1988 (both dates included) ?
(a) 110      (b) 111      (c) 112      (d) 113

(x) The areas of three adjacent faces of a rectangular box are known. The product of these areas is equal to :
(a) the volume of the box      (b) twice the volume of the box
(c) the square of the volume of the box      (d) cube root of its volume

## PART-II

*Answer to Question Nos. 4 to 9 are to be given in the space provided at the end of Q. No. 9*

$(3 \times 4 = 12)$

**Q.4.** (i) Solve : $\dfrac{4}{5}\left[2\dfrac{1}{2} + 2\dfrac{2}{5} \text{ of } \left\{\dfrac{2}{3} + \dfrac{5}{6}\left(1\dfrac{2}{3} + 1\dfrac{5}{6}\right)1\dfrac{1}{5}\right\}\right]$

(ii) Arrange the fractions given below in ascending order : $\dfrac{5}{6}, \dfrac{6}{8}, \dfrac{7}{9}$ and $\dfrac{11}{13}$

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(*iii*) Find the greatest number that will divide 729 and 901 leaving remainder 9 and 5 respectively.

(*iv*) Annual incomes of Vidur and Ishan are in the ratio of 4 : 3 and their expenses are in the ratio 3 : 2, if each of them saves Rs. 600 at the end of the year, find the annual income of each.

**Q. 5.** (*i*) Divide Rs. 12,540 among A, B and C, so that A receives 3/7 of B and C together, and B may receive 2/9 of what A and C together receive.

$(3 \times 4 = 12)$

(*ii*) A batsman has a certain average of runs for 16 innings. In the 17$^{th}$ innings, he scores 85 runs, thereby increasing his average by 3. What is the average after the 17$^{th}$ inning ?

(*iii*) A sum of money is lent at simple interest at the rate of 11 % per annum for two different periods 3½ years and 4½ years. If the difference in interests for two periods is Rs. 412.50, find the sum ?

(*iv*) In how many years will a sum of Rs. 800 at 10 % p.a. compounded semi annually become Rs. 926.10 ?

**Q. 6.** (*i*) The difference in simple and compound interest on a certain sum of money in 2 years at 15 % per annum is Rs. 144. What is the sum ?

$(4 \times 3 = 12)$

(*ii*) Six men earn as much as 8 women, 2 women earn as much as 3 boys and 4 boys earn as much as 5 girls. If a girl earns Rs. 50 a day, then find earning of a man.

(*iii*) A and B can do a piece of work in 24 days, B and C can do it in 48 days and A and C in 32 days. In how many days, they will finish the work if they work together.

**Q.7.** (*i*) Pranay goes to school at the rate of 2½ km/hr and reaches 6 minutes late from the scheduled time. If he travels at the speed of 3 km/hr, he is 10 minutes early. What is the distance of his school ?

$(4 \times 3 = 12)$

(*ii*) The perimeter of a square and a rectangle is 48 m each. The difference between the areas of the two is 4 sq. m. Find the length and breadth of rectangle.

(*iii*) The arc of a segment of a circle has measure 120°. If the radius of the circle is 6 cm. Find the area of the segment.

**Q.8.** (*i*) A sphere of copper with diameter 18 cm, is melted and converted into a wire having its diameter 4 mm. Find the length of the wire.

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(*ii*) Factorize the following :

(a) $a^3 (b-c)^3 + b^3 (c-a)^3 + c^3 (a-b)^3$

3

(b) $x^6 - y^6$

3

(*iii*) The sides (in cm) of a right angled triangle containing the right angle are 5x and 3x − 1. If the area of the triangle is 60 cm², find the sides of the triangle.

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**Q.9.**(*i*) Find the area of the trapezium given in the adjacent figure

$(2 \times 4 = 8)$

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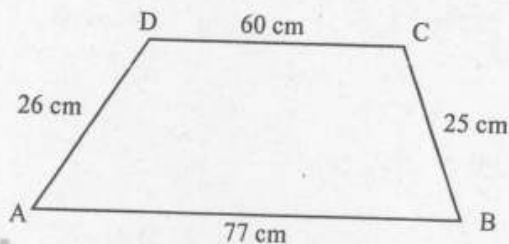
(ii) The following is the frequency distribution of marks of 50 students : 4

| Marks | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
|---|---|---|---|---|---|---|---|---|
| No. of students | 5 | 13 | 17 | 10 | 1 | 0 | 2 | 1 |

(a) Find the class mark of fourth class interval.

(b) How many students got less than 80 marks ?

(c) What is the lower limit of 5th class ?