



# RISE OF NATION ACADEMY

"We Create the Impeccable Creature"

## Test Paper

Standard – X

Subject – Mathematics SET-A

Topic – Full Course

Date – 08/02/2018

Times – 03:00 hrs.

Max. Marks - 80

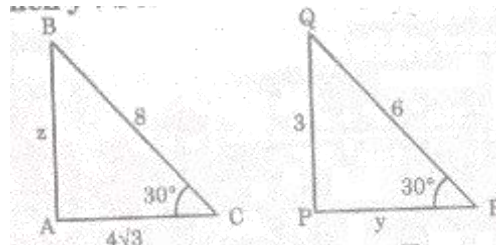
Min. Marks – 40

### General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of **30** questions divided into four sections **A, B, C and D**.
- (iii) Section **A** contains **6** questions of **1** mark each. Section **B** contains **6** questions of **2** marks each. Section **C** contains **10** questions of **3** marks each. Section **D** contains **8** questions of **4** marks each.
- (iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of **calculators** is not permitted.

### Section-A

- Q 1.** The H.C.F. and L.C.M. of two positive integers are 'h' and 'l' respectively, if one integer is  $a$ , then find other integer.
- Q 2.** Find the Discriminant of quadratic equation  $4\sqrt{5}x^2 - \sqrt{5}x - \sqrt{20} = 0$ .
- Q 3.** In figure,  $\triangle ABC \sim \triangle PQR$ , then find  $y + z$ .



- Q 4.** If  $\tan\theta + \frac{1}{\tan\theta} = 2$ , then find the value of  $\tan^2\theta + \frac{1}{\tan^2\theta}$ .
- Q 5.** A semicircular sheet of metal of diameter 28 cm is bent into an open conical cup. Find the depth and capacity of the cup.

**Q 6.** Card is marked with numbers 2 to 90 are placed in a box and mixed thoroughly, one card is drawn at random from the box, find the probability that the card drawn shows a number which is a perfect square.

### Section-B

**Q 7.** Check whether  $15^n$  can end with digit zero for any natural number  $n$ .

**Q 8.** Find the middle term of the AP: -11, -7, -3.....,45.

**Q 9.** Prove that the points (1, 5), (3, 4) and (-1, 6) are the Vertices of isosceles triangle.

**Q 10.** TP is a tangent to the circle with centre O .If  $\angle TOQ = 120^\circ$  find the diameter of the circle when  $OT=10\text{cm}$ .

**Q 11.** If  $A, B$  and  $C$  are the interior angles of  $\Delta ABC$ , then prove that

$$\tan\left(\frac{A+B}{2}\right) = \frac{c}{2}$$

**Q 12.** Radius and height of a cone are in the ratio 4 : 3. Area of the base of the cone is 2464 sq.cm. Find its height.

### Section-C

**Q 13.** An army contingent of 616 members is to march behind an army band of 56 members in a parade. Two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

**Q 14.** The students of a class are made to stand in rows. If three students are extra in each row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class.

**Q 15.** A peacock is sitting on the top of a pillar which is 9 m high .From a point 27 m away from the bottom of the pillar. A snake is coming to its hole at the base of pillar. Seeing the snake the peacock pounces on it .If their speeds are equal at what distance from the hole is the snake caught.

**Q 16.** The digits of a positive number of three digits are in A.P. and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

**Q 17.** The vertices of an equilateral triangle ABC are A(0,0), B(3,√3), C(0,2√3). Find its area. Also verify Your answer using the formula. Find its area .Also verify your answer using the formula  $(\frac{\sqrt{3}a^2}{4})$  .where a is length of each Side of an equilateral triangle.

**Q 18.** Prove that :  $(\frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta}) (\frac{1-\sin \theta}{\cos \theta}) = 1$

**Q 19.** Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60°. Find the distance between the two men.

**Q 20.** The perimeters of the ends of the frustum of a cone are 207.24 cm and 169.56 cm. if the height of the frustum be 8 cm, find the whole surface area of the frustum.

**Q 21.** The mean of the distribution given below is 14.4. find the values of x and y, if the sum of frequency is 20.

Class Interval	0-6	6-12	12-18	18-24	24-30
Frequency	4	x	5	y	1

**Q 22.** A box consists of 100 shirts of which 88 are good, 8 have minor defects and 4 have major defects. Ramesh, a shopkeeper will buy only those shirts which are good but ‘kewal’ another shopkeeper will not buy shirts with major defects. A shirt is taken out of the box at random. What is the probability that.

- I. Ramesh will buy the selected shirt?
- II. Kewal will buy the selected shirt?

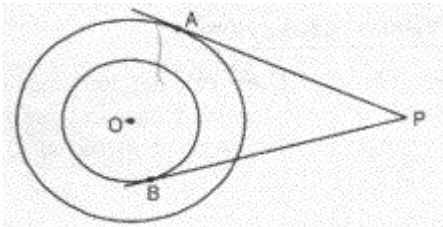
### Section-D

**Q 23.** A part of monthly expenses of a family is constant and the remaining varies with the price of rice. When the cost of rice is 250 Rs. per quintal, the monthly expenditure of the family is 1000 Rs. and when the cost of rice is 240

Rs. per quintal the monthly expenditure is 980 Rs. find the monthly expenditure of the family when the cost of rice is 300 Rs. per quintal.

**Q 24.** Ridhima required 2500 Rs. after 12 weeks to send her daughter to school She saved 100 Rs. in the first week and increased her weekly saving by 20 Rs. every week. Find whether she will be able to send her daughter after 12 weeks. What value is generated in the above situation?

**Q 25.** In figure, there are two concentric circles, with centre O and of radii 5 cm and 3 cm. from an external point P, tangents PA and PA and PB are drawn to these circles. If AP = 12 cm, find the length of BP.



**Q 26.** Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact and write the value of angle in semi-circle.

**Q 27.** Draw a right  $\Delta ABC$  in which  $AB = 6\text{ cm}$ ,  $BC = 8\text{ cm}$  and  $\angle B = 90^\circ$ . Draw BD perpendicular from B on AC and draw a circle passing through the points B, C and D. Construct tangents from A to this circle.

**Q 28.** A vertical tower stands on a horizontal plane and is surmounted by a flagstaff of height 5 m. From a point on the ground the angles of elevation of the top and bottom of the flagstaff are  $60^\circ$  and  $30^\circ$  respectively. Find the height of the tower and the distance of the point from the tower. (take  $\sqrt{3} = 1.732$ )

**Q 29.** A cylindrical tub, whose diameter is 12 cm and height 15 cm is full of ice-cream. The whole ice-cream is to be divided into 10 children in equal ice-cream cones, with conical base surmounted by hemispherical top. If the height of conical portion is twice the diameter of base, find the diameter of conical part of ice-cream cones.

**Q 30.** 200 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in English alphabets in the surnames was obtained as follows:

No. of letters	1-5	5-10	10-15	15-20	20-25
No. of surnames	20	60	80	32	8

Find the median.

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