## JSUNIL TUTORIAL

### **PERIODIC TEST - 3, 2018-19**

CLASS – X MATHEMATICS S

[ Max. Marks: 80

Time: 3 Hours]

### **General Instructions:**

- (i) All questions are compulsory.
- (ii) This 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) Use of calculator is not permitted.

### SECTION - A

[Question numbers 1 to 6 carry 1 mark each.]

- Given that HCF (306, 657) = 9, find LCM (306, 657).
- If  $\sin \theta = \cos \theta$ , find the value of  $\theta$ .
- If ABC and DEF are similar triangles such that  $\angle A = 57^{\circ}$  and  $\angle E = 73^{\circ}$ , what is the measure of  $\angle C$ ?
- If a square is inscribed in a circle. What is the ratio of the areas of the circle and the square?
- 5. If the sum of first p terms of an AP is  $ap^2 + bp$ , find its common difference.
- Write the condition to be satisfied for which equations  $ax^2 + 2bx + c = 0$  and  $bx^2 2\sqrt{acx} + b = 0$  have equal roots.

### SECTION - B

[Question numbers 7 to 12 carry 2 marks each.]

Find the roots of quadratic equation by factorisation method  $2x^2 - x + \frac{1}{8} = 0$ .

8. Prove that the length of tangents from an external point are equal.

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9/ Find the quadratic polynomial, the sum and product of whose zeroes are -3 and 2 respectively.

19// Given 15 cot A = 8, find sin A and sec A.

11. Find the sum of the odd numbers between 0 and 50.

c 12. Find the point on the x-axis which is equidistant from (2, -5) and (-2, 9).

### SECTION - C

[Question numbers 13 to 22 carry 3 marks each.]

13. Prove that  $\sqrt{7}$  is an irrational number.

Obtain all other zeroes of  $x^4 - 6x^3 - 26x^2 + 138x - 35$ , if two of its zeroes are  $2 \pm \sqrt{3}$ .

15, If the area of two similar triangles are equal, prove that they are congruent.

16. A chord of a circle of radius 12 cm subtends an angle of  $60^{\circ}$  at the centre. Find the areas of the corresponding minor and major segment of the circle. (Use  $\pi = 3.14$ )

Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angle of elevation of the top of the poles are 60° and 30° respectively. Find the height of the poles and the distance of the point from the poles.

A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

Draw a triangle ABC with side BC = 7 cm,  $\angle$ B = 45°,  $\angle$ A = 105°. Then construct a triangle

whose sides are  $\frac{4}{3}$  times the corresponding sides of  $\triangle ABC$ .

The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

21. Prove the identity -

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \csc A + \cot A$$

Determine the ratio in which the line 2x + y - 4 = 0 divides the line segment joining the points A(2, -2) and B(3, 7).

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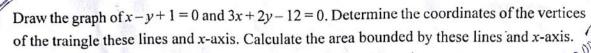
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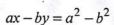
### SECTION - D

[Question numbers 23 to 30 carry 4 marks each.]



- 24. State and prove the converse of Pythagoras Theorem.
- 25. Solve by the method of cross-multiplication.

$$\frac{x}{a} + \frac{y}{b} = 2$$





- 26. A circle is touching the side BC of  $\triangle$ ABC at P and touching AB and AC produced at Q and R respectively. Prove that AQ =  $\frac{1}{2}$  (Perimeter of  $\triangle$ ABC)
- 27. Which term of A.P.: 3, 15, 27, 39, ...., will be 132 more than its 54th term.
- 28. Prove that the parallelogram circumscribing a circle is a rhombus.
- 29. A two-digits number is four times the sum of digits and three times the product of its digits, find the number.
- 30. If  $\sec \theta + \tan \theta = p$ , show that  $\frac{p^2 1}{p^2 + 1} = \sin \theta$