PERIODIC TEST – 3, 2018-19

CLASS – X

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MATHEMATICS

Time : 3 Hours] **[Max. Marks : 80**

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.]

1. Given that HCF (306, 657) = 9, find LCM (306, 657).

2. If $\sin\theta = \cos\theta$, find the value of θ.

3. If ABC and DEF are similar triangles such that $\angle A = 57°$ and $\angle E = 73°$, what is the measure of $\angle C$?

4. 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.

6. 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.]

7. 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.

$a+(n-1)d$
$p+(n-1)d$
$(n-1)=p$
ap^2+bp^2
$(a+p)^2+bp^2$
$a+b$

180
126

P.T.O.

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

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

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

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.

14. 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° at the centre. Find the areas of the corresponding minor and major segment of the circle. (Use $\pi = 3.14$)

17. 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.

18. 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.

19. Draw a triangle ABC with side BC = 7 cm, ∠B = 45°, ∠A = 105°. Then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of ΔABC.

20. 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 –

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A.$$

$\frac{4}{3}\pi r^3 h$ $\pi(r^2+l)$

22. 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).

$\frac{\sqrt{3}}{2} \times \frac{h}{80}$ $40 \tan 60$ $h = 8 \times 20$ $\sqrt{3} = \frac{h}{80}$ $h = 80\sqrt{3}$

SECTION – D

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

23. Draw the graph of $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the traingle these lines and x-axis. Calculate the area bounded by these lines and x-axis.

24. State and prove the converse of Pythagoras Theorem.

25. Solve by the method of cross-multiplication.

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

$$ax - by = a^2 - b^2$$

26. A circle is touching the side BC of ΔABC at P and touching AB and AC produced at Q and R respectively. Prove that AQ = $\frac{1}{2}$(Perimeter of ΔABC)

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 $\dfrac{p^2 - 1}{p^2 + 1} = \sin\theta$.

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