PERIODIC TEST- 2, 2017-2018

Class: X   **MATHEMATICS**   **Marks: 80**

Date: 24.09.2017   **Time: 3hours**

General Instructions:

➢ *All questions are compulsory*
➢ *The question paper consists of 30 questions divided into four sections A, B, C and D.*
➢ *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 and Section D contains 8 questions of 4 marks each.*
➢ *Use of calculator is not permitted.*

SECTIONA

1. The decimal expansion of $\dfrac{16}{3125}$ will terminate after how many places of decimals.

2. If one zero of the quadratic polynomial $2x^2 - 8x - m$ is $\dfrac{5}{2}$, then find the other zero.

3. If the areas of two similar triangles are in the ratio 25: 64, find the ratio of their corresponding sides.

4. Find the value of ($\tan 2^0 \tan 4^0 \tan 6^0$ …………$\tan 84^0 \tan 86^0 \tan 88^0$)

5. If $x . \tan 45^0 . \cos 60^0 = \sin 60^0 . \cot 60^0$, then find x.

6. If $ax^2 + bx + c = 0$ has equal roots, then find the value of c.

SECTION B

7. The sum and the product of zeros of the polynomial $f(x) = 4x^2 - 27x + 3k^2$ are equal, find the value of k.

8. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB.CD$

9. Two poles of height 6m and 11m stand on a plane ground .If the distance between their foot is 12m, find distance between their tops.

10. Given that $\sin (A + B) = \sin A \cos B + \cos A \sin B$, find the value of $\sin 75^0$.

11. Find the median class for the following distribution.

C I	0 - 10	10 - 20	20 - 30	30 - 40	40- 50
f	6	10	12	8	7

12. Find the values of k for which roots of the equation $x^2 - 8kx + 2k = 0$ are equal.

SECTION C

13. Prove that $n^2 - n$ is divisible by 2 for every positive integer n.

14. Solve by the method of completing the squares; $5x^2 - 2x - 2 = 0$.

15. If α, β are the zeroes of the polynomial $6x^3 + 3x^2 - 5x + 1$, then find the value of $\alpha^{-1} + \beta^{-1} + \gamma^{-1}$.

16. Solve for x and y: $\sqrt{2}\, x + \sqrt{3}\, y = 0$, $\sqrt{3}\, x - \sqrt{8}\, y = 0$.

17. Prove that the diagonals of a trapezium divide each other proportionally.

18. Calculate the mode of the following frequency distribution table:

Marks	Above 25	Above 35	Above 45	Above 55	Above 65	Above 75	Above 85
No. of students	52	47	37	17	8	2	0

19. Solve for x and y: 139 x + 56 y = 641   and   56 x + 139 y = 724

20. Find the mean marks from the following data:

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of students	4	10	18	28	40	70

21. Find acute angles A and B, if sin (A + 2B) = $\dfrac{\sqrt{3}}{2}$ and cos (A + 4B) = 0.

22. Prove that, $\dfrac{1}{\sec x - \tan x} - \dfrac{1}{\cos x} = \dfrac{1}{\cos x} - \dfrac{1}{\sec x + \tan x}$

SECTION D

23. If a and b are two odd positive integers such that a > b, then prove that one of the two numbers $\dfrac{a+b}{2}$ and $\dfrac{a-b}{2}$ is odd and the other is even.

24. Find all the zeros of the polynomial $2x^4 - 3x^3 - 5x^2 + 9x - 3$, two of its zeros are $\sqrt{3}$ and $-\sqrt{3}$.

25. A sailor goes 8km downstream in 40 minutes and returns in 1hour .Find the speed of the Sailor in still water and speed of the current.

26. Out of a group of swans 3.5 times the square root of the number are playing on the shore of a tank.

   The remaining two are playing in the water .Find the total number of swans.

27. Prove that ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

28. Convert the following data to a less than type distribution and draw its ogive.

Class Interval	100 -120	120-140	140 - 160	160 - 180	180 - 200
Frequency	12	14	8	6	10

29. If $\sqrt{3} \cot^2 A - 4 \cot A + \sqrt{3} = 0$, then find the value of $\cot^2 A + \tan^2 A$.

30. Every month Krishna saves some money from his pocket money .He has opened a savings bank account with a bank. He deposits his savings in the account every month .One day he withdrew Rs 2000 from his account, the cashier gave him Rs 50 and Rs 100 notes only.
   (a) If Krishna got 25 notes in all, find how many notes of each kind did he get?
   (b) Do you think saving money is a good habit?

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