HALF YEARLY EXAM : 2019-20

Class : X

Subject : MATHS

Time : 1:30 Hrs.   **M.M. : 40**

SECTION - VSA (4x1)

1. State euclid division leemma.

2. Find the common difference of following A.P.
    1, –3, –5, –7 ....

3. Check the given sides make right triangle or not.

4. Find the value of :
    $$\frac{Sin\ 18°}{Cos\ 72°}$$

SECTION-B (4x2)

5. Prove that $3+5\sqrt{2}$ is an irrational no.

6. Find the value of k for which equas have infinitely many solution :
    $$2x + 10y = 14$$
    $$kx + 15y = 21$$

7. Find the co-ordinates of a point A, where AB is the diameter of a circle whose centre is (2, –5) and B is (1, 7).

8. Prove that :
    $$\frac{1 - Sin\ \theta}{1 + Sin\ \theta} = (sec\ \theta - tan\ \theta)^2$$

SECTION-C (4x3)

9. Find four numbers in A.P. ,whose sum is 50 and in which the greatest number is 4 times the least.

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10. In $\triangle ABC$, $\angle A = 90°$ and $AD \perp BC$. Prove that $AD^2 = BD.CD$.

11. Find a relatin between x and y, if the points (x, y), $(1, 2)$ and $(7, 0)$ are collinear.

12. Prove that:

$$\frac{Sin\,A - 2Sin^3\,A}{2\,Cos^3\,A - Cos\,A} = tan\,A.$$

SECTION-D (4x4)

13. If the equation $(1 + m^2)\,x^2 + 2\,mcx + c^2 - a^2 = 0$ has equal roota, prove that $c^2 = a^2\,(1+m^2)$

14. Show that the sequence 3, 6, 9, 12............ is an A.P. Find its 15th term and the general term.

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

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