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CLASS : X **REVISION TEST (Unit-5,6)** **MARKS : 100**
SUBJECT : MATHEMATICS **Date : 22-01-2020** **TIME : 3hrs**

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PART – A 14X1=14

Answer All The Questions :

1. The measure of steepness is called
   a) Angle of inclination b) Slope c) Intercept d) Equation
2. The inclination of X axis and every line parallel to X axis is
   a) $0°$ b) $30°$ c) $60°$ d) $90°$
3. The straight line given by the equation $x = 11$ is
   a) parallel to X axis c) parallel to Y axis
   b) passing through the origin d) passing through the point (0,11)
4. The slope of vertical line is
   a) 0 b) 1 c) -1 d) undefined
5. The slope of the line which is perpendicular to a line joining the points (0,0) and (–8,8) is
   a) -1 b) 1 c) 8 d) -8
6. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is
   a) $\sqrt{3}$ b) $-\sqrt{3}$ c) $-\frac{1}{\sqrt{3}}$ d) 0
7. If a line with slope $m, m \neq 0$ makes x intercept d, then the equation of the straight line is
   a) $y = m(x - d)$ b) $x = m(y - d)$ c) $y = mx$ d) $y = mx + c$
8. Who is "Father of Trigonometry"?
   a) Gauss b) Srinivasa Ramanujan c) Hipparchus d) Pythagoras
9. $\cot\theta = \tan\theta$ if θ is
   a) $0°$ b) $30°$ c) $45°$ d) $60°$
10. The value of $sin^2\theta + \frac{1}{1+tan^2\theta}$ is equal to
    a) $tan^2\theta$ b) 1 c) $cot^2\theta$ d) 0
11. $\tan\theta\, cosec^2\theta - \tan\theta$ is equal to
    a) $\sec\theta$ b) $cot^2\theta$ c) $\sin\theta$ d) $\cot\theta$
12. If $5x = \sec\theta$ and $\frac{5}{x} = \tan\theta$, then $x^2 - \frac{1}{x^2}$ is equal to
    a) 25 b) $\frac{1}{25}$ c) 5 d) 1
13. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}:1$ then the angle of elevation of the sun has measure
    a) $45°$ b) $30°$ c) $90°$ d) $60°$
14. A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is $45°$ than when it has been $30°$, then x is equal to
    a) 41.92m b) 43.92m c) 43m d) 45.6m

PART – B 10x2=20

Answer 10 Questions : (Q.No 28 is compulsory).

15. If the three points $(5,7), (3,p)$ and $(6,6)$ are collinear, find the value of p.
16. Find the equation of a line passing through the point $(3,-4)$ and having slope $\frac{-5}{7}$.

17. The hill in the form of a right triangle has its foot at $(19,3)$. The inclination of the hill to the ground is 45°. Find the equation of the hill joining the foot and top.
18. Find the equation of the straight line passing through the points $(-1,1)$ and $(2,-4)$.
19. Calculate the slope and y intercept of the straight line $8x-7y+6=0$.
20. The equation of a straight line is $2(x-y)+5=0$ .Find its slope, inclination and intercept on the Y axis.
21. Find the equation of the straight line parallel to the line $x-8y+13=0$ and passing through the point $(2,5)$.
22. Prove that $\frac{\sin A}{1+\cos A}=\frac{1-\cos A}{\sin A}$.
23. Prove that $\sec\theta-\cos\theta=\tan\theta\sin\theta$.
24. Prove that $\cot\theta+\tan\theta=\sec\theta\, cosec\,\theta$.
25. Prove that $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}=\sec\theta+\tan\theta$.
26. Find the angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of a tower of height $10\sqrt{3}m$.
27. A player sitting on the top of a tower of height 20m observes the angle of depression of a ball lying on the ground as 60°. Find the distance between the foot of the tower and the ball. $(\sqrt{3}=1.732)$.
28. Prove the identity $(\sin\theta+cosec\,\theta)^2+(\cos\theta+\sec\theta)^2=7+tan^2\theta+cot^2\theta$.

PART – C **10x5=50**

Answer Any 10 Questions : (Q.No 42 is compulsory).

29. Find the area of the quadrilateral formed by the points $(8,6),(5,11),(-5,12)$ and $(-4,3)$.
30. If the points $A(-3,9)$, $B(a,b)$ and $C(4,-5)$ are collinear and if $a+b=1$, then find a and b.
31. Without using Pythagoras theorem, show that the points $(1,-4),(2,-3)$ and $(4,-7)$ form a right angled triangle.
32. Prove analytically that the line segment joining the mid-points of two sides of a triangle is parallel to the third side and is equal to half of its length.
33. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through $(-3,8)$.Find its equation.
34. If the points $A(2,2), B(-2,-3), C(1,-3)$ and $D(x,y)$ form a parallelogram then find the value of x and y.
35. Find the equation of a straight line through the intersection of lines $5x-6y=2$, $3x+2y=10$ and perpendicular to the line $4x-7y+13=0$.
36. If $\cos\theta+\sin\theta=\sqrt{2}\cos\theta$, then prove that $\cos\theta-\sin\theta=\sqrt{2}\sin\theta$.
37. If $\frac{\cos\theta}{1+\sin\theta}=\frac{1}{a}$, then prove that $\frac{a^2-1}{a^2+1}=\sin\theta$.
38. If $\frac{\cos\alpha}{\cos\beta}=m$ and $\frac{\cos\alpha}{\sin\beta}=n$, then prove that $(m^2+n^2)cos^2\beta=n^2$.
39. From a point on the ground, the angle of elevation of the bottom and top of a tower fixed at the top of a 30m high building are 45° and 60° respectively. Find the height of the tower. $(\sqrt{3}=1.732)$.
40. An aeroplane at an altitude of 1800m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats.$(\sqrt{3}=1.732)$

41. From the top of a tree of height 13m the angle of elevation and depression of the top and bottom of another tree are $45°$ and $30°$ respectively. Find the height of the second tree. $(\sqrt{3} = 1.732)$.
42. If $x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$, then prove that $x^2 - y^2 = a^2 - b^2$.

PART – D **2x8=16**

Answer All The Questions :

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4} > 1$). **(OR)**

b) Draw a circle of radius $3cm$. From an external point $7cm$ away from its centre, construct the pair of tangents to the circle and measure their lengths.

44. a) Discuss the nature of the solution of the quadratic equation $x^2 - 2x - 3 = 0$. **(OR)**

b) Draw the graph of $y = x^2 + 4x + 3$ and use it to solve $x^2 + x + 1 = 0$.

ALL THE BEST

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