ΣXEMPLAR POINT ΣP PVT. LTD.

X MATHS TEST ON REAL NOS, POLYNOMIALS, LINEAR, QUADRATIC, TRIGO AND APLLICATION, A.P. AND SIMILAR TRIANGLES.

TIME: 2 HOURS **M.M.: 60**

1. Find the 12th term from the end of A.P. 3, 8, 13, ... 253; ? **1**

2. Find the value of $\cos(40°-A)-\sin(50°+A)$ **1**

3. If the roots of the equation $x^2 - 5x + k = 0$ differ by unity then find k. **1**

4. Perimeter of two similar triangles ABC & PQR are respectively 36 cm and 24 cm. If PQ = 10 cm, find AB. **1**

5. Prove that the diagonals of a trapezium divide each other proportionally. **2**

6. If the mth term of an A.P. be $1/n$ & n^{th} term be $1/m$, then show that $(mn)^{th}$ terms is 1. **2**

7. ABC is a triangle in which AB = AC and D is a point on AC such that $BC^2 = AC \times CD$. Prove BD = BC. **2**

8. Find the maximum sum of the series $20 + 19\frac{1}{3} + 18\frac{2}{3} + 18 + ...$ **2**

9. Solve using method of cross multiplication $\frac{x}{a}+\frac{y}{b}=a+b$ and $\frac{x}{a^2}+\frac{y}{b^2}=2$. **3**

10. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides. **3**

11. Find the greatest 6-digit number which when divided by 6,12,18,24 leaves remainder 5 in each case? **3**

12. The sum of n terms of two AP are in the ratio of (3n+8):(7n+15), find ratio of 12th term. **3**

13. If the remainder on division of $x^3 + 2x^2 + kx + 3$ by $(x − 3)$ is 21, then find the quotient and the value of k. Hence, find the zeroes of the cubic polynomial $x^3 + 2x^2 + kx −18$. **3**

14. Prove that $(sinA + secA)^2 + (cosA + cosecA)^2 = (1 +secA\ cosecA)^2$. **3**

15. If a line divides any two sides of a triangle in the same ratio, then the line must be parallel to the third side. Prove converse of this result. **3**

16. P is any point in the interior of rectangle ABCD. Find the value of PA, if PB = 4, PD=3 & PC =2. **3**

17. In an equilateral triangle ABC, the side BC is trisected at D. Prove that $9AD^2 = 7AB^2$. **4**

18. A peacock is sitting on the top of a pillar which is 9m high. From a point, 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake, the peacock pounces it. If their speeds are equal, at what distance from the hole is the snake caught ? **4**

19. Two poles of height a metres and b are p metres apart. Prove that the height of the point of intersection of lines joining the top of each pole to the foot of the opposite pole is given by ab/(a+b) metres. **4**

20. After covering a distance of 30 km with a speed there is some defect in a train engine and therefore , its speed is reduced to 4/5 of its original speed. consequently, the train reaches its destination late by 45 minutess. had it happened after covering 18 kilometres more, the train would have reached 9 minutes earlier. find the speed of the train and the distance of journey. **4**

21. A parachutist is descending vertically and makes angles of depression of 45^0 and 60^0 at two observing points to 100 m apart from each other on the left sides of himself. Find the maximum height from which he falls and the distance of the point where he falls on the ground from the just observation point. **4**

22. If sec A = $x + \frac{1}{4x}$ then prove that secA + tanA = 2x or $\frac{1}{2x}$. **4**