Code No. **Series AG-TS4**   **CLASS X**   **TMG-D/79/89**

18th

Time Allowed : 3 hours   **Maximum Marks : 80**

- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5 questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

SECTION A

1. Find the sum and product of zeroes of the polynomial $5x^2 - 7x + 2$.
2. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then find k.
3. If the nth term of the A.P.-1, 4, 9, 14……is 129, find the value of n.
4. If $\frac{p}{q}$ is a rational number $(q \neq 0)$, what is the condition on q so that the decimal

    representation of $\frac{p}{q}$ is terminating?
5. Find the value of $\sin^2 33^0 + \sin^2 57^0$.
6. If $\triangle ABC \sim \triangle DEF$, $\angle A = 36^0$ and $\angle E = 74^0$. find $\angle C$.
7. The sides of a triangle are 5cm, 12cm and 13cm. check if this triangle is a right triangle.
8. A solid sphere of radius r is melted and a solid cone of height r is made from it. Find the radius of the base of the cone.
9. A die is thrown once. Find the probability of getting a number greater than 4.
10. Find the median class of the following distribution:

class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	8	7	13	9	10	3

SECTION B

11. Find the zeroes of the quadratic polynomial $4x^2 + 4x - 3$.
12. Evaluate: $\dfrac{\cos^2 45^0}{\sec^2 30^0 + \cos ec30^0}$.
13. The vertices of a triangle are A(3,4), B(7,2) and C(-2,-5). Find the length of the median through the vertex A.

14. In ΔPQR S and T are point on the side PQ & PR such that $\dfrac{PS}{SQ} = \dfrac{PT}{TR}$ and $\angle PST = \angle PRQ$. prove that ΔPQR is an isosceles triangle.

15. A card is drawn at random from a well shuffled deck of 52 cards. Find the probability of getting a (i) red face card   (ii) queen or a king.

<div align="center">OR</div>

     A bag contains 3 red and 5 white balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is (i) not white   (ii) white

<div align="center">**SECTION C**</div>

16. Prove that $\sqrt{3}$ is irrational.

<div align="center">OR</div>

     Express $0.\overline{3}$ in the form of $\dfrac{a}{b}$ where a and b are coprime and $b \neq 0$

17. By cross multiplication method, solve the pair of the linear equations
$$ax + by + a = 0 \qquad bx + ay + b = 0$$

18. Draw the graph of the following pair of linear equation:
$$x + y = 7, \quad 5x + 2y = 20$$
     Shade the triangular region between these two lines and the x-axis.

19. Find the sum of 1+ 6+ 11+ 16+ ……+81.

<div align="center">OR</div>

     If 8th and 15th terms of an A.P. are 5 and 33 respectively, find its 5th term and the nth term.

20. Prove that $\dfrac{1-\cos\theta}{1+\cos\theta} = (\cot\theta - \cos ec\theta)^2$.

<div align="center">OR</div>

     If $\tan 2A = \cot(A - 18^0)$ and 2A is an acute angle, then find the value of A.

21. Show that the point (7,10),(3,-4) and (-2,5) are the vertices of an isosceles triangle.

22. Find the ratio in which the line 3x+y-9=0 divides the line segment joining the points (1,3) and (2,7).

23. A quadrilateral PQRS is drawn so as to circumscribe a circle. Prove that PS+QR = PQ + RS .

24. Draw a circle of 3cm radius. Take a point P which is 5cm away from the centre of the circle. Draw two tangents to the circle from the point P.

25. In the adjoining figure, a square OABC is inscribed in a quadrant OPBQ. If OA=20cm,
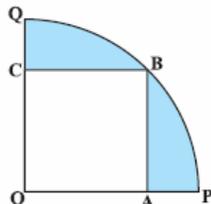
find the area of the shaded region   . (Take $\pi = 3.14$)

<div align="center">**SECTION D**</div>

26. Daily pocket expenses (in Rs) of 80 students of a school are given in the table below:

Expenses(in Rs)	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No. of students	5	15	20	10	10	15	5

Draw 'less than' and 'more than' ogives on the same graph and hence find median of the given frequency distribution.

27. If a line is drawn parallel to one side of a triangle, the other two sides are divided in the same ratio. Prove. Use this result to prove the following: if ABCD is a trapezium in which $ABIIDCIIEF$, then $\dfrac{AE}{ED} = \dfrac{BF}{FC}$

28. A boy is standing on the ground and flying a kite with a string of 150m at an angle of elevation of 30^0 .Another boy is standing on the roof of a 25m high building and is flying his kite at an elevation of 45^0 .Both the boys are on opposite sides of both the kites. Find the length of the string in metres correct to two decimal places, that the second boy must have so that the two kites meet.

OR

The angles of elevation of the top of a tower from two points on the level ground, at distances a and b units (a>b) from the base of the tower and in the same straight line with it, are complementary. Prove that the height of the tower is $\sqrt{ab}$ units.

29. If the radii of the circular ends of a bucket 45cm high are 28cm and 7cm, find the capacity of the bucket. Also find the curved surface area of the bucket.

OR

A toy is in the form of a right circular cylinder with a hemisphere on one end and a cone on the other. The height and radius of the cylindrical part are 13cm and 5cm respectively. The radius of hemisphere and base of the conical part are same as that of the cyclinder. Calculate the surface area of the toy, if the height of the cone is 12cm. (Take $\pi = \dfrac{22}{7}$)

30. The hypotenuse of a right angled triangle is 6 metres more than twice the shortest side. If the third side is 2m less than the hypotenuse, find the sides of the triangle.
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