Year of Quality education 18th

Code No. **Series AG-TS4**

CLASS X

TMG-D/79/89

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 5questions 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. If HCF(24,x)= 6 and LCM(24,x) = 144, then what is the value of x ?
2. If one zero of the quadratic polynomial $2x^2 + px + 4$ is 2, what is the other zero?
3. Given below are three equations which two of them infinite number of solutions?
   $3x - 2y = 4; 6x + 2y = 4; 9x - 6y = 12.$
4. Write the discriminate of the quadratic equation: $3x^2 - 2x + \frac{1}{3} = 0.$
5. If an AP $\{a_n\}$ is defined by $a_n = \begin{cases} 0 & if n is odd \\ 1 & if n is even \end{cases}$ .find its 21st term.
6. What is the ratio of the v olume of a cube to that of a sphere which will exactly fit inside the cube .
7. Write the value of $\frac{3\cos 51^\circ}{\sin 39^\circ} - \frac{\sin 15^\circ}{2\cos 75^\circ}$.
8. What is the distance between the points(7, -1) and (3,2) ?
9. Three cubes each of volumes 8cu cm are joined end-to-end. What is the volume of the resulting cuboid?
10. If a number x is chosen at random from the numbers -2, -1, 0, 1, 2,what is the probability that $x^2 < 1$?

SECTION B

11. Find the points of intersection of the line represented by the equations 7y-3x = 3 with (i)x-axis and (ii) y-axis.
12. Find the 27th and the nth term of the AP: 5, 2, -1, -4, -7, ……..
13. Find the value of θ if $\sin 4\theta = \cos(\theta - 20^\circ)$ where 4θ is an acute angle.

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14. One end of a diameter of a circle is at (2,30 and the centre is (-2, 5). What are the coordinates of the other end of this diameter?

OR

If A(4, -8), B(-9, 7) C(18, 13) are the vertices of a ΔABC, find the length of the median through the vertex B.

15. Find the coordinates of the points of trisection of the line segment joining A(-3, 2) and B(9, 5).

SECTION C

16. Show that the cube of any positive integer is the either of the form 9m, 9m + 1 or 9m + 8 for some integer m.

OR

Prove that $2\sqrt{5}-3$ is an irrational number.

17. On dividing $3x^3+4x^2+5x-13$ by a polynomial g(x), the quotient and remainder are 3x + 10 and 16x -43 respectively. Find the polynomial g(x).

18. Find the number of terms if an AP: 20, $19\frac{1}{3}, 18\frac{2}{3}$, ….. of which the sum is 300.

19. Draw a circle of radius 3.5 cm. From a point P, 6cm away from its centre, construct a pair of tangents to the circle. Measure the lengths of the tangents.

20. The bisectors of $\angle B$ and $\angle C$ of a ΔABC, meet the opposite sides in D and E respectively. If ED II BC, then prove that the tringle ABC is isosceles.

21. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

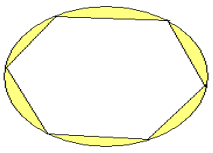
OR

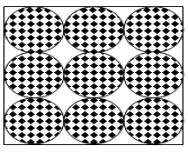
Two concentric circes of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

22. Prove the following identity : secA (1- sin A) (sec A + tan A) = 1 .

23. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, then find the value of x and y.

24. A round table cover has six equal designs as shown in the figure. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of Rs. 0.35 per square centimeter (Use $\sqrt{3}=1.7$) .





OR

On a square handkerchief, nine circular designs of each of radius 7 cm are made in the figure. Find the area of the remaining portion of the handkerchief.

25. Savita and Anita are friends . What is the probability that both will have (i) the same birthday (ii) different day ? (Ignore the leap year)

SECTION D

26. In a class test, the sum of Shefali's marks in mathematics and English is 30. Had she got 2 more marks in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

OR

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The difference of squares of two positive numbers is 180. The square of the smaller number is 8 times the greater number. Find the two numbers.

27. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.
    using the above theorem prove the following:
    The area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.
28. The angles of elevation of the top of tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with if are complementary. Prove that the height of the tower is 6 m.
29. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand.

    OR

    A copper wire, 3 mm in diameter, is wound about a cylinder whose length is 12 cm and diameter 10 cm, so as to lower the curved surface of the cylinder. Find rthe length and mass of the wire, assuming the density of copper to be 8.88 g per cu cm.
30. Age (in years) of 100 persons of a small locality were recorded and data is presented below:

Age (in years)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Number ofpersons	5	15	20	23	17	11	9

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