



Code No. **Series AG-F2**

TMG-D/79/89

- 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.

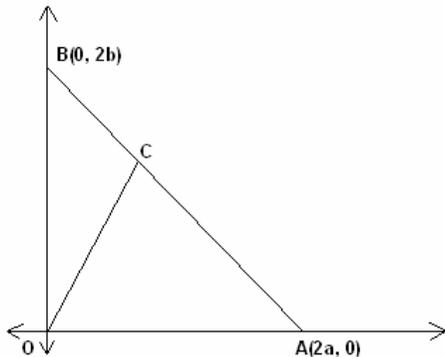
Pre-Board Examination 2009 -10

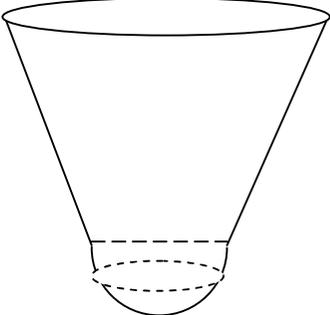
Time: 3 hrs.

M.M.: 80

CLASS – X MATHEMATICS

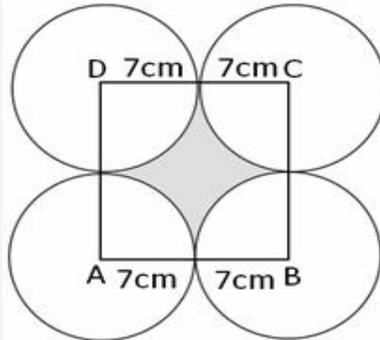
Q.1	How do you find median of the data using graph of less than and more than ogive.
Q.2	What is the ratio of the area of a circle and an equilateral triangle whose diameter and a side are respectively equal.
Q.3	What is the perimeter of a sector of angles 45° of a circle with radius 7 cm? (Use $\pi = \frac{22}{7}$).
Q.4	Two tangents TP and TQ are drawn from an external point T to a circle with centre O, as show in fig. If they are inclined to each other at angle 100° the what is the value of $\angle POQ$
Q.5	Express $\sin 67^\circ + \cos 75^\circ$ in terms of trigonometric ratios of angles between 0° and 45°
Q.6	If in $\triangle ABC$, $DE \parallel BC$, $AD=2.4$, $DB=3.6$, $AC=5$ find AE.

Q.7	A box contains cards marked with numbers 5 to 20. A card is drawn from the bag at random. Find the probability of getting a number which is a perfect square.
Q.8	The prime factorization of 2310 is $2 \times 3 \times a \times 7 \times b$. Find a and b.
Q.9	Two friends were born in the year 2000. What is the probability that they have the same birthday?
Q.10	If the sum of the first n terms of an A.P. is given by $3n^2 - n$, determine its 25 th term.
Section B	
Q.11	Two black kings are removed from a pack of 52 cards and a card is drawn. Find the probability of getting (i) a spade (ii) a king
Q.12	A circle touches the side BC of a $\triangle ABC$ at P and AB and AC when produced at Q and R respectively. Show that $AQ = \frac{1}{2}$ (perimeter of $\triangle ABC$)
Q.13	Solve for x and y: $\frac{ax}{b} - \frac{by}{a} = a + b$ and $ax - by = 2ab$
Q.14	If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, find the value of k and a if the remainder $x + a$.
Q.15	Rahul saved Rs 5 the first week of the year and then increased his weekly savings by Rs 1.75 each week. In what week will his saving be Rs 20.75? or A sum of Rs 280 is to be used to award four prizes. If each prize after the first is Rs 20 less than the next most valuable one, find the value of each of the prizes.
Section C	
Q.16	A square field and an equilateral triangular park have equal perimeter. If cost of ploughing the field at rate of Rs. 5/m ² is Rs. 720 find the cost of maintaining the park at the rate of Rs.10/m ²
Q.17	In the given figure, a right triangle AOB is given. C is the mid point of the hypotenuse AB. Show that it is equidistant from the vertices O, A and B.  Or Given two fixed points P(-3, 4) and Q(5, -2). Calculate the co-ordinates of points A and B in between PQ, such that $5PA = 3PQ$ and $3PB = 2PQ$.

<p>Q.18</p>	<p>Prove that $2(\sin^6 \theta + \cos^6 \theta) - 3(\sin^4 \theta + \cos^4 \theta) + 1 = 0$.</p> <p style="text-align: center;">Or</p> <p>Prove that : $\left(\frac{1}{\sec^2 \theta - \cos^2 \theta} + \frac{1}{\cos^2 \theta - \sin^2 \theta} \right) \sin^2 \theta \cos^2 \theta = \frac{1 - \sin^2 \theta \cos^2 \theta}{2 + \sin^2 \theta \cos^2 \theta}$.</p>
<p>Q.19</p>	<p>For what value of k, does $(k-12)x^2 + 2(k-12)x + 2 = 0$ have equal roots?</p> <p style="text-align: center;">Or</p> <p>Solve $(a-b)x + (a+b)y = a^2 - 2ab - b^2, (a+b)(x+y) = a^2 + b^2$.</p>
<p>Q.20</p>	<p>Any point 'X' inside DEF is joined to its vertices. From a point 'P' in DX, PQ is drawn parallel to DE meeting XE at 'Q' and QR is drawn parallel to EF meeting XF in R. Prove that PR//DF.</p>
<p>Q.21</p>	<p>A shuttle cock used for playing badminton has the shape of a frustum of a cone mounted on a hemisphere. The external diameters of the frustum are 5cm and 2cm, the height of the entire shuttle cock is 7cm. Find its external surface area.</p> <div style="text-align: center;">  </div>
<p>Q.22</p>	<p>Construct an isosceles triangle, whose base is 10 cm and altitude 5 cm and then another triangle whose sides are $1\frac{1}{2}$ times the corresponding sides of the isosceles triangle.</p>
<p>Q.23</p>	<p>Determine graphically the co-ordinates of the vertices of the triangle formed by the lines representing the equations: $x + y = 5$; $x - y = 5$; $x=0$.</p>
<p>Q.24</p>	<p>If the mth terms of an A.P. is equal to n times its nth term, find the (m+n)th term of the A.P.</p>
<p>Q.25</p>	<p>In a class test, the sum of Gagan's marks in Mathematics and English is 45. If he had 1 more mark in Mathematics and 1 less in English, the product of marks would have been 500. Find the original marks obtained by Gagan in Mathematics and English separately.</p>
<p>Section D</p>	
<p>Q.26</p>	<p>The height of a house subtends a right angle at the opposite window. The angle of elevation of the window from the base of the house 60°. If the width of the road is 6 m, find the height of the house.</p> <p style="text-align: center;">or</p> <p>A straight highway leads to the foot of tower. A man standing at the top of the tower</p>

observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six second later, the angle of depression of car is found to be 60° . Find the time taken by car to reach the foot of the tower from this point.

Q.27 Four equal circles, each of radius 7cm touch each other as shown in figure. Find the area included between them.



Q.28 The height (in cm) of 60 persons of different age groups are shown in the following table:

Height (in cm)	145-150	150-155	155-160	160-165	165-170	170-175
Number of Persons	8	10	9	15	10	8

Using the above table, draw (i) less than ogive (ii) more than ogive on the same graph and find median also.

Q.29 A solid consisting of a right circular cone of height 120 cm and radius 60 cm surmounted on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm.

or

A circular tent of total height 50 meters is to be made in the form of right circular cylinder surmounted by a right circular cone. If the height and radius of the conical portion of the tent are 15 m and 20 m respectively, find the cost of the cloth required, at the rate of Rs 14 per square meter to make the tent.

Q.30 Prove that in a right angle triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.
Using the above result prove the following: In $\triangle ABC$, D is mid point on BC, $AE \perp BC$. If $AC > AB$ then show that $AB^2 = AD^2 - BC \cdot DE + \frac{1}{4}BC^2$.
