



Code No. **Series AG-FA**

TMG-D/79/89

- Please check that this question paper contains 4 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.

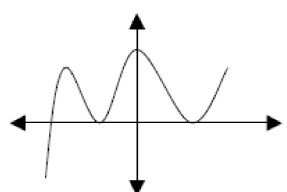
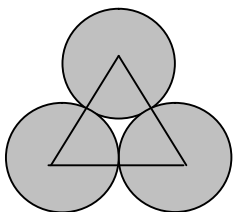
M.M.: 80

CLASS – X

MATHEMATICS

Section A

Q.1	Find n if $140 = 2^n \times 5 \times 7$
Q.2	If the sum of zeros of the polynomial $2x^3 - kx^2 + 4x - 5$ is 6, find value of k.
Q.3	In an A.P. if common difference $d = 6$, find $a_5 - a_{11}$.
Q.4	If $(\operatorname{cosec} \theta - \sin \theta)(\sec \theta - \cos \theta)(\tan \theta + \cot \theta) = k$, find the value of k.
Q.5	Find the perimeter of quadrant of a circle whose circumference is 22 cm.
Q.6	A card is drawn from a deck of 52 cards, find the probability that the card drawn is a honour card.
Q.7	In the formula of mode of a grouped data, $\text{Mode} = 1 + \left\{ \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right\} \times h$, where symbols have their usual meaning, what does f_0 represent.
Q.8	In a trapezium ABCD, AB \parallel CD and the diagonals intersect each other at O. If $AO = (x - 1)$ cm, $OC = (x + 6)$ cm, $OD = (x + 4)$ CM and $BO = (X - 2)$ cm, find the value of x.
Q.9	If PA and PB are two tangents from external point P to a circle with centre O and angle $APB = 35^\circ$ find the angle OAB.

<p>Q.10</p>	<p>The graph of $y=f(x)$ is given. Find the number of zeroes of $f(x)$.</p> 
<p>Section B</p>	
<p>Q.11</p>	<p>If the sum of the squares of the polynomial $x^2 - 8x + k$ is 40, find the value of k.</p>
<p>Q.12</p>	<p>Find the value of $\sin 60^\circ$ geometrically.</p>
<p>Q.13</p>	<p>Find the probability that the card drawn from deck of 52 cards is (i) red card and ace (ii) neither queen nor black card (iii) face card or king (iv) face card and diamond.</p> <p style="text-align: center;">OR</p> <p>Find the probability of getting 53 Sunday and Monday in a leap year.</p>
<p>Q.14</p>	<p>Find the relation between x and y if the points (x,y), $(1,2)$ and $(7,0)$ are collinear.</p>
<p>Q.15</p>	<p>If all sides of a parallelogram touch a circle, show that parallelogram is a rhombus.</p>
<p>Section C</p>	
<p>Q.16</p>	<p>Prove that $1/\sqrt{3}$ is irrational number.</p>
<p>Q.17</p>	<p>If the polynomial $6x^4 + 8x^3 - 5x^2 + ax + b$ is exactly divisible by the polynomial $2x^2 - 5$, then find value of a and b.</p>
<p>Q.18</p>	<p>α, β, γ are the zeroes of the cubic polynomial $x^3 - 12x^2 + 44x + c$. If α, β, γ are in A. P., find the value of c.</p> <p style="text-align: center;">OR</p> <p>Three numbers are in the ratio 3: 7: 9. If 5 is subtracted from the second, the resulting numbers are in A.P. Find the original numbers.</p>
<p>Q.19</p>	<p>Determine graphically the co-ordinate of the vertices of the triangle, the equations whose sides are: $y = 0, 2x - y + 6 = 0, 4x + 5y = 16$.</p>
<p>Q.20</p>	<p>Solve $(a + 2b)x + (2a - b)y = 2, (a - 2b)x + (2a + b)y = 3$.</p>
<p>Q.21</p>	<p>In figure, a crescent is formed by two circles which touch at A. C is the centre of the large circle. The width of crescent at BD is 9 cm and at EF is 5 cm. Find the area of the shaded region.</p> <p style="text-align: center;">or</p> <p>Find the area of the unshaded region in Fig. if the perimeter of the equilateral triangle is 42cm.</p> 

Q.22	Draw a $\triangle ABC$ with side $BC = 7\text{cm}$, $\angle B=45^\circ$, $\angle A=105^\circ$. Then construct a \triangle whose sides are $\frac{4}{3}$ times the corresponding sides of $\triangle ABC$.												
Q.23	The vertices of a triangle are $(2,a)$, $(1,b)$ and $(c^2,-3)$, (i) Prove that its centroid cannot lie on the y-axis. (ii) Find the condition that the centroid may lie on the x-axis.												
Q.24	If $a \sin^3 x + b \cos^3 x = \sin x \cos x$ and $a \sin x - b \cos x = 0$ prove that $a^2 + b^2 = 1$. or If $\operatorname{cosec} \theta - \sin \theta = l$ and $\sec \theta - \cos \theta = m$, prove that $l^2 m^2 (l^2 + m^2 + 3) = 1$.												
Q.25	The vertices of a $\triangle PQR$ are $P(4, 6)$, $Q(1, 5)$ and $R(7, 2)$. A line is drawn to intersect sides PQ and PR at S and T respectively, such that $\frac{PS}{PQ} = \frac{PT}{PR} = \frac{1}{4}$. Calculate the area of the $\triangle PST$ and compare it with the area of $\triangle PQR$.												
Section D													
Q.26	Find the mean, median and mode of the following data: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Class Interval</td> <td>0-100</td> <td>100-200</td> <td>200-300</td> <td>300-400</td> <td>400-500</td> </tr> <tr> <td>Frequency</td> <td>6</td> <td>9</td> <td>15</td> <td>12</td> <td>8</td> </tr> </table>	Class Interval	0-100	100-200	200-300	300-400	400-500	Frequency	6	9	15	12	8
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Q.27	Prove that the ratio of the areas of two similar triangles is equal to the ratio of square of their corresponding sides. Using the above, prove the following: In a $\triangle ABC$, $XY \parallel BC$ and it divides $\triangle ABC$ into two parts equal in area. Prove that $\frac{BX}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}}$												
Q.28	A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an angle of elevation 30° . A girl standing on the roof of 20m high building finds the angle of elevation of the same bird, at the same time, to be 45° . Both the boy and the girl are on opposite sides of the bird. Find the distance of bird from the girl. or The angle of elevation of a cloud from a point 200m above the lake is 30° and the angle of depression of the reflection of the cloud in the lake is 60° . Find the height of the cloud.												
Q.29	A train overtakes two persons who are walking in the same direction in which the train is going, at the speed of 2 km/hr and 4 km/hr and passes them completely in 9 and 10 seconds respectively. Find the length and speed of the train.												
Q.30	A hollow cone is cut by a plane parallel to the base and upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line-segments into which the cone's altitude is divided by the plane.												

or

A sector of a circle of radius 12 cm has the angle 120° . It is rolled up so that two bounding radii are joined together to form a cone. Find the volume of the cone.

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