



Code No. **Series AG-5-3689**

General Instructions :

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A, B, C and D. Section – A comprises of 10 questions of 1 mark each. Section – B comprises of 8 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 6 questions of 4 marks each.
3. Question numbers 1 to 10 in Section – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculator is not permitted.
6. An additional 15 minutes time has been allotted to read this question paper only.

सामान्य निर्देश :

1. सभी प्रश्न अनिवार्य हैं।
2. इस प्रश्न पत्र में 34 प्रश्न हैं, जो चार खण्डों में अ, ब, स व द में विभाजित हैं। खण्ड – अ में 10 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 8 प्रश्न हैं और प्रत्येक प्रश्न 2 अंकों का है। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंकों का है। खण्ड – द में 6 प्रश्न हैं और प्रत्येक प्रश्न 4 अंकों का है।
3. प्रश्न संख्या 1 से 10 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही विकल्प चुनें।
4. इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंकों में, 3 प्रश्न 3 अंकों में और 2 प्रश्न 4 अंकों में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
5. कैलकुलेटर का प्रयोग वर्जित है।
6. इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न-पत्र को पढ़ेंगे और वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

Pre-Board Examination 2010 - 11

Time : 3 to 3 1/2 Hours

Maximum Marks : 80

अधिकतम समय : 3 से 3 1/2

अधिकतम अंक : 80

Total No. Of Pages : 14

कुल पृष्ठों की संख्या : 14

CLASS – X MATHEMATICS

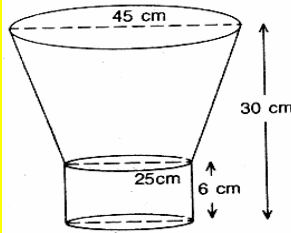
Section A

Q.1	If a and b are the roots of $x^2 - px + q = 0$, then $a^2 + b^2 =$ (a) $p^2 + q^2$ (b) $p^2 + 2q$ (c) $p^2 - q^2$ (d) $p^2 - 2q$. Ans d
Q.2	It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameter 16 m and 12 m in a locality. The radius of the new park would be (a) 10 m (b) 15 m (c) 20 m (d) 24 m . Ans a
Q.3	Which term of the A.P. 24, 21, 18, 15, is the first negative term? (a) 8 th (b) 10 th (c) 12 th (d) 6 th . Ans b
Q.4	If the angles of elevation of the top of a tower from two points at distances a and b from the base and in the same straight line with it are complementary, then the height of the tower is

	(a) \sqrt{ab} (b) ab (c) $\frac{a}{b}$ (d) $\sqrt{\frac{a}{b}}$. Ans a
Q.5	The circumference of a circle is 100 cm. the side of a square inscribed in the circle is (a) $50\sqrt{2}$ cm. (b) $\frac{100}{\pi}$ cm. (c) $\left(\frac{50\sqrt{2}}{\pi}\right)$ cm. (d) $\left(\frac{100\sqrt{2}}{\pi}\right)$ cm. . Ans c
Q.6	A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and diameter of base is 4 cm. if a right circular cylinder circumscribes the solid, find how much more space it will cover. (a) $4\pi cm^3$ (b) $6\pi cm^3$ (c) $8\pi cm^3$ (d) $\frac{16}{3}\pi cm^3$. Ans d
Q.7	The point of intersection of medians of a triangle whose vertices are (-1,0), (5,-2) and (8,2) is (a) (4,0) (b) $\left(-8, \frac{4}{3}\right)$ (c) $\left(\frac{4}{3}, 8\right)$ (d) $\left(\frac{4}{3}, -8\right)$. Ans a
Q.8	A quadrilateral ABCD is drawn to circumscribe a circle. If AB = 5CM, CD = 9CM, BC = 8CM, the AD = (a) 7cm (b) 6cm (c) 5cm (d) 4cm . Ans b
Q.9	A right ΔABC right angled at A drawn to circumscribe a circle of radius 5cm with centre O. If AC = 17cm and AB = 18cm, then OC is equal to (a) 10cm (b) 9cm (c) 12cm (d) 13cm . Ans d
Q.10	From the word 'POSSESSIVE', a letter is chosen at random. The probability of it to be S is (a) $\frac{3}{10}$ (b) $\frac{4}{10}$ (c) $\frac{3}{6}$ (d) $\frac{4}{6}$. Ans (b)
Section B	
Q.11	Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre.
Q.12	If $T_n = \frac{2T_{n-1} + 3}{4}$ find T_2 where $T_1 = 3$. Ans : $T_2 = \frac{9}{4}$
Q.13	A chord of a circle of radius 12cm subtends an angle of 120° at the centre. Find the area of the corresponding segment of the circle. . Ans $36\sqrt{3}$ OR Three cubes of a metal whose edges are in the ratio 3:4:5 are melted and converted into a single cube whose diagonal is $12\sqrt{3}$ cm. find the edges of the three cubes. . Ans a = 12 x = 2 ,6,8,10
Q.14	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. . Ans 145°
Q.15	A box contains cards bearing numbers from 6 to 70. if one card is drawn at random from the box, find the probability that it bears. (i) a one digit number (ii) a number divisible by 5. . Ans (i) $\frac{4}{65}$ (ii) $\frac{1}{5}$
Q.16	In the following A.P. find the missing terms -4, *, *, *, *, 6 . Ans 2,0,2,4
Q.17	Determine the ratio in which the line $3x + 4y - 9 = 0$ divides the line segment joining the points (1,3) and (2,7). . Ans 6:25
Q.18	Solve for x: $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$. Ans $\left\{\frac{3a}{4b}, \frac{-2b}{3a}\right\}$

Section C	
Q.19	<p>A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel ? Ans WATER LEVEL RAISED BY 1 CM .</p> <p style="text-align: center;">OR</p> <p>If h, c and V respectively are the height, the curved surface and volume of cone, prove that $3\pi v h^3 - c^2 h^2 + 9v^2 = 0$.</p>
Q.20	<p>Two dice are thrown simultaneously. What is the probability that (i) 4 will not come up either times? (ii) 4 will come up at least once? . Ans (i) 25/36 (ii) 11/36</p>
Q.21	<p>Find the area of the quadrilateral whose vertices in order are A(-5,-3), B(-4,-6), C(2,-1) and D(1,2). Ans 23 sq. units</p>
Q.22	<p>The sum of three terms of an A.P. is 21 and the product of the first and the third terms exceeds the second term by 6, find three terms. Ans 1 , 7 , 13</p> <p style="text-align: center;">OR</p> <p>How many terms of the series 54, 51, 48, ... be taken so that their sum is 513 ? Explain the double answer. Ans n = 18 or 19 Explanation :- Sum of 18 term is equal to sum of 19 term because 19th term is zero .</p>
Q.23	<p>In the given figure, quadrilateral ABCD is circumscribing a circle with centre O. Find x if GC = 3 cm,</p> <div style="text-align: center;"> </div> <p>BC = 7 cm, AH = 5 cm and AB = x cm. Ans 9cm</p>
Q.24	<p>Find the coordinates of the points which divide the line segment joining the points (-8, 0) and (4,-8) in four equal parts. Ans (-5,-2),(-2,-4), (1,-6)</p>
Q.25	<p>A boy is standing on the ground and flying a kite with a string of length 150 m .at an angle of elevation of 30°. Another boy is standing on the roof of a 25 meter heigh building and is flying his kite at an elevation of 45° . Both the boys are on opposite side of both the kites . Find the length of string correct to two decimal places , that the second boy must have so that the two kites meet . and the angle of depression of the base of the hill as 30°. Calculate the distance of the hill from the ship and the height of the hill. Ans length of string = 70.71m</p>
Q.26	<p>The co-ordinates of A,B,C are (6,3), (-3,5) and (4,-2) respectively and P is any point on (x,y). show that the ratio of the areas of triangles PBC and ABC is $\left \frac{x + y - 2}{7} \right$.</p>
Q.27	<p>Prove that the parallelogram circumscribing a circle is a rhombus.</p>
Q.28	<p>A metallic bucket is in the shape of a frustum of a cone mounted on a hollow cylindrical base given in the figure. If the diameters of two circulars ends of the bucket are 45cm and 25 cm, total vertical height is 30 cm and that of the cylindrical portion is 6 cm . Also find the volume of water it can hold. $\left(\pi = \frac{22}{7} \right)$ Ans: Height of frustum = 30-6=24 cm</p> <p>Radi of circular end = 22.5 & 12 . 5 ; Volume of bucket it can hold = volume of frustum =</p>

$$\frac{\pi h}{3} (r_1^2 + r_2^2 + r_1 r_2) = 772.388 \text{ cm}^3$$



OR

Water is being pumped out through a circular pipe whose internal diameter is 7 cm. If the flow of water is 72cm per second, how many litres of water are being pumped out in one hour ? **Ans volume of water flow out per hour = 9979200 cubic cm = 9979.2 liters**

Section D

Q.29 Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.

Q.30 A balloon moving in a straight line, passes above two points A and B on the ground. When it is vertically above point A, its angle of elevation at point B is found to be 60°. When it is vertically above point B, its angle of elevation as observed from A is found to be 45°. Points A and B are 1000 m apart. Find the distance of the point from A, where it touches the ground. **Ans 2366meter**

Q.31 The first term of an A.P. is unity and the ratio of the sum of the first five terms to the sum of the next five terms is 9 : 29. Find the A.P. **Ans 1,5,9.....**

Q.32 A tent is in the shape of a right circular cylinder upto a height of 3m and conical above it. The total height of the tent is 13.5m and radius of base is 14m. Find the cost of cloth required to make the tent at the rate of ₹ 80 per sq. m. **Ans l = 17,5m; A = 1034m; cost = 82720Rs**

OR

The radii of circular ends of a solid frustum of a cone are 33cm and 27cm and its slant height is 10cm. Find its total surface area. **Ans 7599.4cm²**

Q.33 The area of an equilateral triangle is $49\sqrt{3} \text{ cm}^2$. taking each vertex as centre; a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the triangle not included in the circles. **Ans Required area = $\left\{ 49\sqrt{3} - 3 \left(\frac{60}{360} \times \frac{22}{7} \times 7^2 \right) \right\} = \{ 49\sqrt{3} - 77 \} = 7.77 \text{ cm}^2$**

Q.34 Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The larger tap takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

$$\text{Ans } \frac{1}{x} + \frac{1}{x+10} = \frac{8}{75} ; 25 \text{ hours}$$

OR

A shopkeeper buys a number of books for ₹ 80. If he had thought 4 more books for the same amount, each book would have cost ₹ 1 less. How many books did he buy? **Ans $\frac{80}{x} - \frac{80}{x+4} = 1 ; 16 \text{ Books}$**
