

Code No. **Series AG-1899-P**

- 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. Please check that this question paper contains 3 printed pages.
2. All questions are compulsory.
3. The question paper consists of 34 questions divided into four sections A, B and C & D .Section A contains 10 multiple choice type of questions of 1 marks each . Section B is of 8 questions of 2 marks each , Section C is of 10 questions of 3 marks each and Section D is of 6 questions of 4 marks each .
4. Write the serial number of the question before attempting it.
5. If you wish to answer any question already answered, cancel the previous answer.

Pre-Board Examination 2010 -11

Time: 3 hrs.

M.M.: 80

CLASS – X MATHEMATICS

Section A

Q.1	Which of the following equations has two distinct real roots ? (a) $2x^2 - 3\sqrt{2}x + \frac{9}{4} = 0$ (b) $x^2 + 4x - 3\sqrt{2} = 0$ (c) $x^2 - 4x - 3\sqrt{2} = 0$ (d) $5x^2 - 3x + 1 = 0$
Q.2	Sum of first n terms of a series is $5n^2 + 2n$, then its second term is (a) 15 (b) 16 (c) 17 (d) none of these
Q.3	The probability that a card drawn from a pack of 52 cards will be a diamond or a king is (a) $\frac{2}{13}$ (b) $\frac{4}{13}$ (c) $\frac{1}{13}$ (d) $\frac{1}{52}$
Q.4	Two concentric circles are of radii 13cm and 5cm. The length of the chord of larger circle which touches the smaller circle is (a) 12cm (b) 20cm (c) 24cm (d) 26cm
Q.5	The coordinates of the middle points of the sides of a triangle are (4, 2) (3, 3) and (2, 2), then the coordinates of its centroid are (a) (3, 7/3) (b) (3, 3) (c) (4,3)(d) none of these
Q.6	There are 25 tickets bearing numbers from 1 to 25. One ticket is drawn at random. The probability that the number on it is a multiple of 5 or 6 is (a) $\frac{7}{25}$ (b) $\frac{9}{25}$ (c) $\frac{11}{12}$ (d) $\frac{13}{25}$
Q.7	If one roots of the equation $px^2 - 14x + 8 = 0$ is six times the other, then p is equal to (a) 2 (b) 3 (c) 1 (d) none of these
Q.8	Find the angle of elevation of the top of a tower $100\sqrt{3}$ m long, from a point at a distance of 100m ,

TMC/D/79/89

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P.T.O.

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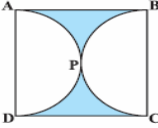
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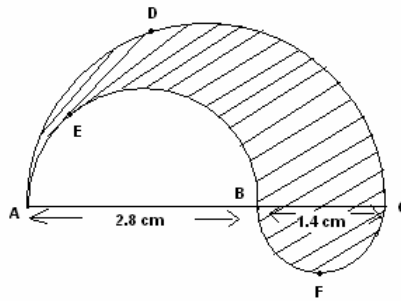
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	<p>from the foot of the tower in a horizontal plane. (a) 45° (b) 30° (c) 60° (d) NONE</p>
Q.9	<p>The area of the shaded region in Fig. , if ABCD is a square of side 14 cm and APD and BPC are semicircles. (a) $24cm^2$ (b) $42cm^2$ (c) $420cm^2$ (d) none of these</p>
Q.10	<p>TP and PQ are the two tangents to a circle with centre O, so that $\angle POQ = 100^{\circ}$, then $\angle PTQ$ is equal to (a) 60° (b) 70° (c) 80° (d) 90°</p>
Section B	
Q.11	<p>A solid sphere of radius 6cm is melted and recast into small spherical balls each of diameter 0.6cm. Find the number of balls thus obtained.</p>
Q.12	<p>Write the nature of roots of the quadratic equation $\sqrt{5}x^2 - 3\sqrt{6}x - \sqrt{20} = 0$.</p>
Q.13	<p>What is the perimeter of a sector of angles 45° of a circle with radius 7 cm? (Use $\pi = \frac{22}{7}$).</p> <p style="text-align: center;">OR</p> <p>The diameter of a circle is 84 cm. find the number of revolutions it will make in moving 792 meters.</p>
Q.14	<p>There are four male and six female candidates for the selection of a vacancy of a teacher in a school. If the selection is made, find the probability that (i) Male is selected (ii) Female is selected.</p>
Q.15	<p>The distance between A (x,7) and B (1,3) is 5. calculate x.</p>
Q.16	<p>The encircle of ΔABC touches the side AB, BC & CA at P, Q & R respectively. Show that $AP + BQ + CR = \frac{1}{2}$ (perimeter of ΔABC).</p>
Q.17	<p>Determine k so that $4k + 8, 2k^2 + 3k + 6, 3k^2 + 4k + 4$ are three consecutive terms of an A. P.</p>
Q.18	<p>If the coordinates of the middle point of the line segment joining the point (2, 1) (1, -3) be (α, β), prove that $6\alpha + \beta - 8 = 0$.</p>
Section C	
Q.19	<p>Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is</p> <ol style="list-style-type: none"> an even number a number less than 14 a number which is a perfect square a prime number less than 20. <p style="text-align: center;">OR</p> <p>Two customers SEAROSE and POOJA are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day so on another day . What is the probability that both will visit the shop on (i) same day ?(ii) consecutive days?(iii) different days ?</p>
Q.20	<p>In fig, find the perimeter of shaded region where ADC, AEB and BFC are semi-circles on diameters</p>



AC, AB and BC respectively

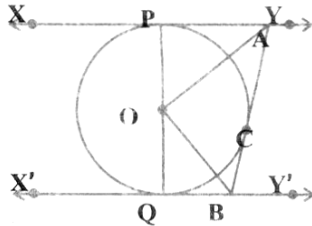
- Q.21** Find the number of terms in the series $20, 19\frac{1}{3}, 18\frac{2}{3}, \dots$ of which the sum is 300, explain the double answer.
- Q.22** There are two poles, one each on either bank of a river. just opposite to each other. One pole is 60m high. From the top of this pole, the angles of depression of the top and the foot of the other pole are 30° and 60° respectively. Find the width of the river and the height of the other pole.
- Q.23** The rain water from a roof $22\text{m} \times 20\text{m}$ drains into a cylindrical vessel having diameter of base 2m and height 3.5 m . If the vessel is just full, find the rainfall in cm.
OR
Water flows at the rate of 10m per minute through a cylindrical pipe having its diameter as 5mm. How much time will it take to fill a conical vessel whose diameter of base is 40cm and depth 24cm ?
- Q.24** In what ratio does the point P (p,-5) divide the line segment joining A(-3,5) and B (4,-9) ? Also find p .
- Q.25** Prove that, the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the center of the circle.
- Q.26** Draw a circle of 3.4 cm radius. Take a point P outside the circle. Draw two tangents to the circle from the point P without using the center .
- Q.27** An iron solid sphere of radius 3 cm is melted and recast into small spherical balls of radius 1cm each. Assuming that there is no wastage in the process, find the number of small spherical balls made from the given sphere.
- Q.28** The co-ordinates of the vertices of ΔABC are A (4,1), B (-3,2) and C (0 , k). Given that the area of ABC is 12unit^2 , find the value of k.

Section D

- Q.29** The denominator of a fraction is 1 more than twice the numerator. The sum of the fraction and its reciprocal is $2\frac{16}{21}$. Find the fraction .
OR
Some students planned a picnic. The budget for food was Rs.500. But 5 of these failed to go and thus the cost of food for each student increased by Rs. 5. How many students attended the picnic .
- Q.30** The sum of the first, p, q, r terms of an A.P. are a, b, c respectively. Show that $\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$.
- Q.31** A metallic right circular cone 20 cm high and whose vertical angle is 60° is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\frac{1}{16}$ cm, find the length of the wire. (Use $\pi = \frac{22}{7}$)

Q.32

In Fig., XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that $\angle AOB = 90^\circ$.



Q.33

A bucket of height 8 cm and made up of copper sheet is in the form of frustum of a right circular cone with radii of its lower and upper ends as 3 cm and 9 cm respectively. Calculate: (i) the height of the cone of which the bucket is a part (ii) the volume of water which can be filled in the bucket. (iii) the area of copper sheet required to make the bucket (leave the answer in terms of π).

Q.34

A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 12 minutes for the angle of depression to change from 30° to 45° how soon after this, will the car reach the tower?

OR

A boy is standing on the ground and flying a kite with 150 m of string at an elevation of 30° . Another boy is standing on the roof of a 25 m high building and is flying his kite at an elevation of 45° . Both the boys are on opposite sides of both the kites. Find the length of the string that the second boy must have so that the two kites meet.

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