- 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 34 questions.


## GENERAL INSTRUCTIONS :

1. All question are compulsory.
2. The question paper consists of 34 questions divided into four sections $A, B, C$ and $D$. Section - A comprises of 10 question 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 lf 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 है, जो चार खण्डों में अ, ब, स व द में विभाजित है। खण्ड - अ में 10 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड - ब में 8 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड - स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड - द में 6 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको 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 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको 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 लिऐ 15 मिनिट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न-पत्र को पढेंगे और वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगें।

## Pre-Board Examination 2011-12

Time : 3 to $31 / 4$ Hours
Maximum Marks : 80
Total No. Of Pages : 4

अधिकतम समय : 3 से $31 / 4$
अधिकतम अंक : 80
कुल पृष्ठों की संख्या : 4

| CL | S X CBSE (SA-2) MATHEMATICS |
| :---: | :---: |
| SECTION A |  |
| Q. 1 | If a and b are the roots of $x^{2}-p x+q=0$, then $a^{2}+b^{2}=$ <br> (a) $p^{2}+q^{2}$ <br> (b) $p^{2}+2 q$ <br> (c) $p^{2}-q^{2}$ <br> (d) $p^{2}-2 q$ <br> . 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 <br> (a) 10 m <br> (b) 15 m <br> (c) 20 m <br> (d) 24 m . Ans a |
| Q. 3 | Which term of the A.P. $24,21,18,15, \ldots \ldots \ldots$ is the first negative term? <br> (a) $8^{\text {th }}$ <br> (b) $10^{\text {th }}$ <br> (c) $12^{\text {th }}$ <br> (d) $6^{\text {th }}$ <br> . 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 <br> (a) $\sqrt{a b}$ <br> (b) ab <br> (c) $\frac{a}{b}$ <br> (d) $\sqrt{\frac{a}{b}}$ <br> Ans a |
| Q. 5 | The circumference of a circle is 100 cm . the side of a square inscribed in the circle is <br> (a) $50 \sqrt{2} \mathrm{~cm}$. <br> (b) $\frac{100}{\pi} \mathrm{~cm}$. <br> (c) $\left(\frac{50 \sqrt{2}}{\pi}\right) \mathrm{cm}$. <br> (d) $\left(\frac{100 \sqrt{2}}{\pi}\right) \mathrm{cm}$. Ans c |
| TMC/D | 11 P.T.O. |


| Q. 6 | A solid toy is in the from 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) $4 \pi \mathrm{~cm}^{3}$ <br> (b) $6 \pi \mathrm{~cm}^{3}$ <br> (c) $8 \pi \mathrm{~cm}^{3}$ <br> (d) $\frac{16}{3} \pi \mathrm{~cm}^{3}$ <br> Ans d |
| :---: | :---: |
| Q. 7 | The point of intersection of medians of a triangle whose vertices are ( $-1,0$ ), (5,-2) and $(8,2)$ is <br> (a) $(4,0)$ <br> (b) $\left(-8, \frac{4}{3}\right)$ <br> (c) $\left(\frac{4}{3}, 8\right)$ <br> (d) $\left(\frac{4}{3},-8\right)$ <br> Ans a |
| Q. 8 | A quadrilateral ABCD is drawn to circumscribe a circle. $\mathrm{If} \mathrm{AB}=5 \mathrm{CM}, \mathrm{CD}=9 \mathrm{CM}, \mathrm{BC}$ <br> $=8 \mathrm{CM}$, the $\mathrm{AD}=$ <br> (a) 7 cm <br> (b) 6 cm <br> (c) 5 cm <br> (d) 4 cm Ans b |
| Q. 9 | In Fig. 3, the length of PR is : <br> Fig. 3 <br> (A) 20 cm <br> (B) 26 cm <br> (C) 24 cm <br> (D) 28 cm <br> Ans b |
| Q. 10 | The probability of guessing the correct answer to certain question is $\frac{\mathrm{p}}{12}$. If the probability of not guessing the correct answer to same question is $\frac{3}{4}$, the value of $p$ is : <br> (A) 3 <br> (B) 4 <br> (C) 2 <br> (D) 1 <br> Ans. A |
| 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 | Determine ' $a$ ' so that $2 a+1, a^{2}+a+1$ and $3 a^{2}-3 a+3$ are consecutive terms of an A.P. Ans $: a=1,2$ <br> For terms to be in A.P. $\begin{array}{ll}  & a^{2}+a+1-(2 a+1)=3 a^{2}-3 a+3-\left(a^{2}+a+1\right) \\ \text { or } & a^{2}-3 a+2=0 \\ \Rightarrow & a=1 \quad \text { or } \quad a=2 \end{array}$ |
| Q. 13 | A chord of a circle of radius 12 cm subtends an angle of $120^{\circ}$ at the centre. Find the area of the corresponding segment of the circle. Ans $36 \sqrt{3}$ <br> OR <br> 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 $12 \sqrt{3} \mathrm{~cm}$. find the edges of the three cubes. . Ans $\mathrm{a}=$ $12 x=2,6,8,10$ |
| Q. 14 | If PA and PB are two tangents from external point P to a circle with centre O and $\angle A P B=35^{\circ}$, find the angle OAB. Ans $145^{\circ}$ |
| 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) $4 / 65$ (ii) $1 / 5$ |
| Q. 16 | In the following A.P. find the missing terms -4, ${ }^{*, *, *, *, 6 ~ A n s ~ 2,0,2,4 ~}$ |
| Q. 17 | Determine the ratio in which the line $3 x+4 y-9=0$ divides the line segment joining the points $(1,3)$ and $(2,7)$. Ans 6:25 |
| Q. 18 | Solve for x: $12 a b x^{2}-\left(9 a^{2}-8 b^{2}\right) x-6 a b=0$ Ans $\left\{\frac{3 a}{4 b}, \frac{-2 b}{3 a}\right\}$ |
| SECTION - C |  |


| Q. 19 | 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 . <br> OR <br> If $\mathrm{h}, \mathrm{c}$ and V respectively are the height, the curved surface and volume of cone, prove that $3 \pi v h^{3}-c^{2} h^{2}+9 v^{2}=0$. |
| :---: | :---: |
| Q. 20 | In a simultaneous throw of a pair of dice, find the probability of getting (i) 8 as the sum <br> (ii) a doublet (iii) a doublet of prime numbers (iv) a doublet of odd numbers (v) a sum greater than 9 (vi) an even number on first (vii) an even number on one and a multiple of 3 on the other (viii) neither 9 nor 11 as the sum of the numbers on the faces (ix) a sum less than 6 (x) a sum less than 7 (xi) a sun more than 7 (xii) different number of both die. ans (i) $\frac{5}{36}$ (ii) $\frac{1}{6}$ (iii) $\frac{1}{12}$ (iv) $\frac{1}{12}$ (v) $\frac{1}{6}$ (vi) $\frac{1}{2}$ (vii) $\frac{11}{36}$ (viii) $\frac{5}{6}$ (ix) $\frac{5}{18}$ (x) $\frac{5}{12}$ (xi) $\frac{5}{12}$ |
| Q. 21 | Find the area of the quadrilateral whose vertices in order are $\mathrm{A}(-5,-3), \mathrm{B}(-4,-6), \mathrm{C}(2,-1)$ and $D(1,2)$. Ans 23 sq. units |
| Q. 22 | 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 <br> OR <br> How many terms of the series $54,51,48, \ldots$ be taken so that their sum is 513 ? Explain the double answer. Ans $\mathrm{n}=18$ or 19 Explaination :- Sum of 18 term is equal to sum of 19 term because $19^{\text {th }}$ term is zero . |
| Q. 23 | In the given figure, quadrilateral ABCD is circumscribing a circle with centre O . Find x if $\mathrm{GC}=3 \mathrm{~cm}, \mathrm{BC}=7 \mathrm{~cm}, \mathrm{AH}=5 \mathrm{~cm}$ and $\mathrm{AB}=\mathrm{x} \mathrm{cm}$. |
| Q. 24 | Find the coordinates of the points which divide the line segment joining the points $(-8$, 0 ) and ( $4,-8$ ) in four equal parts . Ans $(-5,-2),(-2,-4),(1,-6)$ |
| Q. 25 | A boy is standing on the ground and flying a kite with a string of length 150 m at an angle of elevation of $30^{\circ}$. Another boy is standing on the roof of a 25 meter height building and is flying his kite at an elevation of $45^{\circ}$. 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. Ans length of string $=70.71 \mathrm{~m}$ |
| Q. 26 | The co-ordinates of $\mathrm{A}, \mathrm{B}, \mathrm{C}$ are $(6,3),(-3,5)$ and $(4,-2)$ respectively and P is any point on ( $\mathrm{x}, \mathrm{y}$ ). show that the ratio of the areas of triangles PBC and ABC is $\left\|\frac{x+y-2}{7}\right\|$. |
| Q. 27 | Prove that the parallelogram circumscribing a circle is a rhombus. |
| Q. 28 | 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 .Ans $523.53 \mathrm{~cm}^{3}$ <br> OR <br> Water is being pumped out through a circular pipe whose internal diameter is 7 cm . If the flow of water is 72 cm per second, how many litres of water are being pumped out in one hour? Ans volume of water flow out per hour $=9979200$ cubic $\mathrm{cm}=9979.2$ 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 $60^{\circ}$. |
| :---: | :---: |
| 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 $60^{\circ}$. When it is vertically above point $B$, its angle of elevation as observed from $A$ is found to be $45^{\circ}$. 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 $1,5,9 \ldots .$. |
| Q | A tent is in the shape of a right circular cylinder upto a height of 3 m and conical above it. The <br> total height of the tent is 13.5 m and radius of base is 14 m . Find the cost of cloth required to make the tent at the rate of ₹ 80 per sq . m. Ans $l=17,5 m ; A=1034 m ; \cos t=82720 \mathrm{Rs}$ <br> OR <br> The radii of circular ends of a solid frustum of a cone are 33 cm and 27 cm and its slant height is 10 cm . Find its total surface area. Ans $7599.4 \mathrm{~cm}^{2}$ |
| Q. 33 | The area of an equilateral triangle is $49 \sqrt{3} \mathrm{~cm}^{2}$. 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 $=\left\{49 \sqrt{3}-3\left(\frac{60}{360} \times \frac{22}{7} \times 7^{2}\right)\right\}=\{49 \sqrt{3}-77\}=7.77 \mathrm{~cm}^{2}$ |
| 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. $\begin{gathered} \text { Ans } \frac{1}{x}+\frac{1}{x+10}=\frac{8}{75} ; 25 \text { hours } \\ \text { OR } \end{gathered}$ <br> 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 $\frac{80}{x}-\frac{80}{x+4}=1$; 16Books |
|  | $\times$ |
|  | BELIEVE ONE WHO HAS PROVED IT. BELIEVE AN EXPERT. |

