Agyat gupta (TARGET MATHEMATICS)
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PREMIER INSTITUTE for X , XI & XII .

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 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 Sections – 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 mark each. You have to attempt only one lf the alternatives in all such questions.
5. Use of calculator is not permitted.

CLASS X _ 2011-2012 (SA-1)

Time : 3 Hours 15 Minutes **Maximum Marks : 80**

SECTION A

Q.1 If $p(x)=ax^2+bx+c$ & a + c = b, then one of the zeros is

a) $\frac{b}{a}$ (b)$\frac{c}{a}$ (c)$\frac{-c}{a}$ (d)$\frac{-b}{a}$.

Q.2 If $mean=(3median-\mathrm{mod}\,e).k$ then the value of 'k' is

(a)1 (b)2 (c)1/2 (d)3/2.

Q.3 $\Delta ABC \approx \Delta PQR$ AB=24cm AC=30cm BC=9cm PQ=16cm PR= a cm QR= b cm, then the values of 'a' & 'b' are

(i)10,6 (ii) 20, 6 (iii) 6, 20 (iv) 6, 10.

Q.4 If the zeroes of the quadratic polynomial $x^2+(a+1)x+b$ are 2 and -3, then :
(a) a = -7 b = -1 (b) a = 5 b = -1 © a = 2 b = -6 (d) a = 0 b = - 6

Q.5 If $\sqrt{3}\tan\theta=3\sin\theta$, then $(\sin^2\theta-\cos^2\theta)=$
(A) 1 (B) 3 (C) 1/3 (D) ½

Q.6 Given that $\cos\theta=\frac{m}{n}$ then $\tan\theta$ is equal to

(a) $\frac{n}{\sqrt{n^2-m^2}}$ (b) $\frac{\sqrt{n^2-m^2}}{m}$ (c) $\frac{\sqrt{n^2-m^2}}{n}$ (d) $\frac{n}{m}$

Q.7 The product of two irrational numbers is
(A) a rational number (B) an irrational number
(C) either A or B (D) neither A nor B

Q.8 For the following distribution The modal class is :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of students	3	12	27	57	75	80

(A) 10 - 20 (B) 20 - 30 (C) 30 - 40 (D) 50 - 60

Q.9 If a, b are coprime, then a^2, b^2 are :
(a) Coprime(B)Not coprime ©Odd numbers (d)Even numbers

Q.10 $\cos1^0.\cos2^0.\cos3^0.....\cos180^0$ is equal to :
(a) 1 (b) 0 (c) -1 (d) ½

SECTION B

Q.11 ABC is a right Δ right angled at B, AD & CE are two medians drawn from A & C respectively. If AC=5cm & AD=$\frac{3\sqrt{5}}{2}$ Find the length of CE.

Q.12 If one zero of the polynomial $p(x)=(k^2+4)x^2+13x+4k$ is reciprocal of other, then prove that k = 2 .

OR

Find the quotient q(x) and remainder r(x) on dividing f(x) = $10x^4 + 17x^3 - 62x^2 + 30x - 3$ by b(x) = $2x^2 - x + 1$.Also verify by division algorithm .

Q.13 Two towers of heights 10 m and 30m stand on a plane ground. If the

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	distance between their feet is 15m, find the distance between their tops.
Q.14	The HCF & LCM of two numbers are 33 & 264 respectively. When the first number is divided by 2 the quotient is 33. Find the second number.
Q.15	Mean of the following data is 21.5.Find the missing value 'k'.

X	5	15	25	35	45
f	6	4	3	k	2

Q.16	In ΔPQR, S is any point on QR such that $\angle RSP = \angle RPQ$. Prove that $RS \times RQ = RP^2$.
Q.17	A book seller purchased 117 books out of which 45 books are of mathematics and the remaining 72 books are of physics. Each books has same size. Mathematics and Physics books are to be packed in separate bundles and each bundle must contain same number of books. Find the least number of bundles which can be made for these 117 books.
Q.18	Solve for x and y : $47x + 31y = 63; 31x + 47y = 15$
	SECTION C
Q.19	Romila went to a stationery shop and purchased 2 pencil and 3 erasers for Rs 9. Her friend Sonali saw the new variety of pencils and erasers with Romila, and she also bought 4 pencils and 6 erasers of the same kind for Rs 18, Represent this situation algebraically and graphically.
Q.20	Show that $2\sec^2\theta - \sec^4\theta - 2\operatorname{cosec}^2\theta + \operatorname{cosec}^4\theta = \cot^4\theta - \tan^4\theta$.
Q.21	If α and β are the two zeros of the quadratic polynomial $x^2 - 2x + 5$, find a quadratic whose zeros are $\alpha + \beta$ and $\frac{1}{\alpha} + \frac{1}{\beta}$.
Q.22	Prove the identity : $\frac{1}{\operatorname{cosec}\theta - \cot\theta} - \frac{1}{\sin\theta} = \frac{1}{\sin\theta} - \frac{1}{\operatorname{cosec}\theta + \cot\theta}$.
Q.23	ABCD is a parallelogram .E is mid point of CD. The line segment joining B and E intersect AC in L and AD produced in M. Prove that $LM = 2BL$.
	OR
	Prove that the area of the equilateral triangle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles drawn on the other two sides of the triangle.
Q.24	The height (in cm) of 60 person of different age groups are shown in the following table :

Height in cm	No. of persons
145-150	8
150-155	10
155-160	9
160-165	15
165-170	10
170-175	8

	Using the above data draw 'more than' ogive curve also find the median of the data from the graph.
Q.25	State and prove converse of Pythagoras theorem
	OR
	Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
Q.26	Find values of a and b for which the system of linear equations has infinite number of solutions : $(a+b)x - 2by = 5a + 2b + 1; 3x - y = 14$
Q.27	In ΔABC, right angled at B, if tan A = $1/\sqrt{3}$ find the value of $\sin A + \cos C = \cos A + \sin C$.
Q.28	If $\operatorname{cosec}\theta - \sec\theta = m$ and $\sec\theta - \cos\theta = n$, prove that $\left(m^2 n\right)^{2/3} + \left(mn^2\right)^{2/3} = 1$.
	OR

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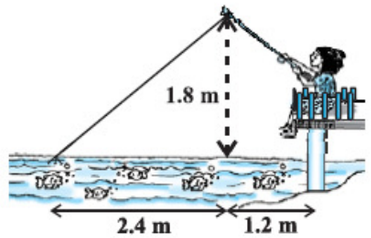
	$\frac{\sec^2(90^0-\theta)-\cot^2\theta}{2(\sin^2 25^0+\sin^2 65^0)}+\frac{2\sin^2 30^0\tan^2 32^0.\tan^2 58^0}{3(\sec^2 33-\cot^2 57)}$.
	SECTION D
Q.29	Find the mode of following distribution : Daily Wages: 31-36 | 37-42 | 43-48 | 49-54 | 55-60 | 61-66 No. of workers: 6 | 12 | 20 | 15 | 9 | 4
Q.30	Solve for x and y : $(a-b)x+(a+b)y=a^2-2ab-b^2;(a+b)(x+y)=a^2+b^2$. **OR** Seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If the difference between the digit is 3, find the number.
Q.31	(I) Prove that $\frac{\cos(90^0-\theta)}{1+\sin(90-\theta)}+\frac{1+\sin(90^0-\theta)}{\cos(90^0-\theta)}=2\cos ec\,\theta$. (II) Evaluate : $\frac{\sec^2(90^0-\theta)-\cot^2\theta}{2(\sin^2 25^0+\sin^2 65^0)}+\frac{2\cos^2 60^0\tan^2 28^0\tan^2 62^0}{3(\sec^2 43^0-\cot^2 47^0)}+\frac{\cot 40^0}{\tan 50^0}$.
Q.32	What must be added to the polynomial $p(x)=5x^4+6x^3-13x^2-44x+7$ so that the resulting polynomial is exactly divisible by the polynomial $Q(x)=x^2+4x+3$ and the degree of the polynomial to be added must be less than degree of the polynomial $Q(x)$.
Q.33	Show that one and only one out of n , n + 3 , n + 6 , n + 9 is divisible by 4 , where n is any positive integer . **OR** Prove that the product of three consecutive positive integer is divisible by 6 .
Q.34	Nazima is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod.

	Assuming that her string (from the tip of her rod to the fly) is taut, how much string does she have out (see Fig. 6.64)? If she pulls in the string at the rate of 5 cm per second, what will be the horizontal distance of the fly from her after 12 seconds?  Fig. 6.64 **OR** In an isosceles triangle ABC with AB=AC. $BD\perp AC$. Prove that $BD^2-CD^2=2CD.AD$
	_____x_____
	"CONFIDENCE IS THE COMPANION OF SUCCESS"

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