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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.

SET 'Q' CLASS X _ 2011-2012 (SA-1)

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

SECTION A

Q.1 The product of the HCF and LCM of the smallest prime number and the smallest composite number is :
(A) 2 (B) 4 (C) 6 (D) 8

Q.2 If $\sin\theta = \cos\theta$, then value of θ is :
(a) 0^0 (b) 45^0 (c) 30^0 (d) 90^0

Q.3 The quadratic polynomial whose sum of zeroes is +3 and product of zeroes is +2 is :
(a) x^2+3x-2 (b) x^2-2x+3 (c) x^2-3x+2 (d) x^2-3x-2

Q.4 If $\cot A = \frac{12}{5}$, then the value of $(\sin A+\cos A)\times \cos ecA$ is :
(a) $\frac{13}{5}$ (b) $\frac{17}{5}$ (c) $\frac{14}{5}$ (d) 1

Q.5 The number of solutions of the pair of linear equations $x+2y-8=0$ and $2x+4y=16$ have :
(a) 0 (b) 1 (c) Infinitely many (d) None

Q.6 $9\sec^2\theta - 9\tan^2\theta$ is equal to :
(a) 1 (b) -1 (c) 9 (d) -9

Q.7 If n is any natural number , then which of the following expressions ends with 0 :
(a) $(3\times 2)^n$ (b) $(4\times 3)^n$ (c) $(2\times 5)^n$ (d) $(6\times 2)^n$

Q.8 $\cos 1^0, \cos 2^0, \cos 3^0 ..... \cos 180^0$ is equal to :
(a) 1 (b) 0 (c) ½ (d) -1

Q.9 Which measure of central tendency is given by the x co-ordinate of the point of intersection of the more than Ogive and less than Ogive.
(A) Mean (B) Median (C) Mode (D) All the above

Q.10 In the figure – 1, $PQ \| BC$ and $AP : PB = 1:2$
Find $\frac{ar(\Delta APQ)}{ar(\Delta ABC)}$

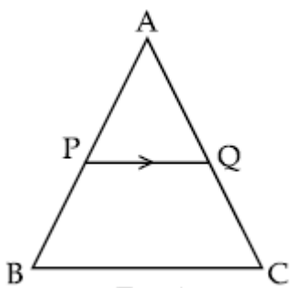

Fig. 1

(A) 1 : 4 (B) 4 : 1 (C) 1 : 9 (D) 2 : 9

SECTION B

Q.11 Using Euclid.s division algorithm, find the HCF of 135 and 225.

Q.12 In the given figure-2, ABCD is a trapezium in which $AB \| DC$. The diagonals AC and DB intersects at O.

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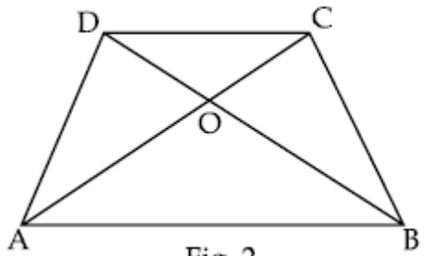

Fig. 2

Prove that $\frac{OA}{OC}=\frac{OB}{OD}$

Q.13 ABC is an isosceles triangle with AC=BC. If $AB^2=2AC^2$. Prove that ABC is an right angled triangle.

Q.14 If $\tan(A+B)=\sqrt{3}$ and $\tan(A-B)=\frac{1}{\sqrt{3}}, 0^0<A+B\le 90^0; A>B$, find A and B.

OR

If $\sin 3A=\cos(A-26)$ where 3A is an acute angle, find the value of A.

Q.15 Find the mean of the following data.

Class Intervals	1 - 3	3 - 5	5 - 7	7 - 9	9 - 11
Frequency	7	8	2	2	1

Q.16 Divide $6x^3+13x^2+x-2$ by $2x+1$, and find quotient and remainder.

Q.17 Convert the following data into a more than type distribution.

Class Intervals	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
Frequency	2	8	12	24	38	16

Q.18 For which value of k will the following pair of linear equations have no solution.
$3x+y=1; (2k-1)x+(k-1)y=2k+1$

SECTION C

Q.19 Prove that $\sqrt{2}$ is an irrational number.

OR

Prove that $\sqrt{3}+\sqrt{5}$ is an irrational number.

Q.20 Show that the square of any positive odd integer is of the form 8m + 1, for some integer m.

Q.21 Find the zeroes of the quadratic polynomial x^2+5x+6 and verify the relationship between the zeroes and the coefficient.

Q.22 Solve for x and y : $(a-b)x+(a+b)y=a^2-2ab-b$ & $(a+b)(x+y)=a^2+b^2$

OR

The sum of the digits of a two digit number is 12. The number obtained by interchanging the two digits exceeds the given number by 18. Find the number.

Q.23 In the figure-3, $XY \| AC$ and XY divides triangular region ABC into two parts equal in area. Find the ratio of $\frac{AX}{XB}$.

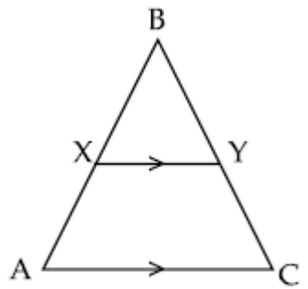

Fig. 3

Q.24 In the figure - 4, if $AD \perp BC$. Prove that $AB^2+CD^2=BD^2+AC^2$

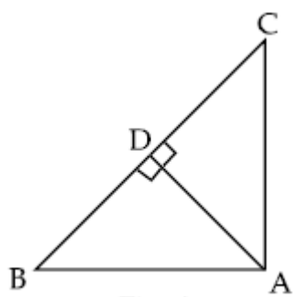

Fig. 4

Q.25 Evaluate :

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	$Sin(50^0+\theta)-\cos(40^0-\theta)+\tan 1^0\tan 10^0\tan 20^0\tan 70^0\tan 80^0\tan 89^0+\sec(90-\theta).$ $\cos ec\theta-\tan(90-\theta).\cot\theta$
Q.26	Prove that $(\sin\theta+\cos ec\theta)^2+(\cos\theta+\sec\theta)^2=7+\tan^2\theta+\cot^2\theta$ **OR** Prove that $(\cos\ ec\ \theta-\sin\ \theta)(\sec\ \theta-\cos\ \theta)=\dfrac{1}{\tan\ \theta+\cot\ \theta}$
Q.27	Find the mode of the following data .

Class Intervals	25 - 35	35 - 45	45 - 55	55 - 65	65 - 75	75 - 85
Frequency	7	31	33	17	11	1

Q.28	Find the median of the following data.

Class Intervals	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	Total
Frequency	8	16	36	34	6	100

	SECTION D
Q.29	Prove that the line drawn parallel to one side of a triangle to intersect the other two sides at distinct points, the other two sides are divided in the same ratio. **OR** Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of other two sides.
Q.30	Find all the zeroes of the polynomial $x^4+x^3-9x^2-3x+18$ if it is given that two of its zeroes are $-\sqrt{3}$ and $\sqrt{3}$
Q.31	Show that $\dfrac{\sin\theta-2\sin^3\theta}{2\cos^2\theta-\cos\theta}=\tan\theta$ OR Prove that $\sin A(1+\tan A)\cos A(1+\cot A)=\sec A+\cos ecA$
Q.32	Prove that $\dfrac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1}=\dfrac{1+\sin\theta}{\cos\theta}$
Q.33	Draw the graph $2x+y=6$ and $2x-y+2=0$ .Shade the region bounded by these lines and x-axis. Find the area of the shaded region.
Q.34	Convert the following data to a less than type distribution and draw its Ogive. Also find median from the graph.

Class Interval	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200
Frequency	12	14	8	6	10

_____x_____

THEORY IS BLIND WITHOUT PRACTICAL .

KNOWLEDGE IS USELESS WITHOUT APPLICATION .

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