##  SAMPLE PAPER-2013

CLASS-X

SUBJECT: MATHS

*1. All questions are compulsory.*

*2. The questions 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.*

SECTION A

1. The decimal expansion of π : (a) is terminating (b) is non terminating, non recurring (c) is non terminating and recurring (d) does not exist.
2. If n and m are positive integers which are not perfect squares then which of the following is not irrational : (a) 2√n (b) √n + √m (c)√ n – √m (d) (√ n+ √m ) ( √n – √m) .
3. A polynomial of degree n can have : (a) atleast n zeros (b) atmost n zeroes (c) exactly n zeroes (d) exactly (n+1 ) zeroes.
4. If x101 + 1001 is divided by x+1, then remainder is : (a) 0 (b) 1 (c) 1490 (d) 1000.
5. A point A is 240m due north of pt. B and C is 180m due east of B. The distance between pt. A and B is : (a) 300m (b) 200m (c) 240m (d) 280m.
6. If cos9α = sinα and 9α < 900, then the value of tan 5α is : (a) 0 (b) ½ (c) 1 (d) √3/2.
7. If cosθ = 0.6, then the value of 5sinθ + 9tan2θ is : (a) 20 (b) 16 (c) 4 (d) 5.
8. The value of x if cosx= cos 600 cos300 + sin600 sin300 is : (a) 450 (b) 600 (c) 900 (d) 300.
9. If sin ( α + β )= cos ( α - β), then value of α is : (a) 300 (b) 600 (c) 450 (d) 900 .
10. The marks of 20 students in a test are as follows : 5,6,8,9,10,11,11,12,13,13,14,14,15,15,15,16,16,18,19,20. Calculate the median (a) 14.96 (b) 15 (c) 14 (d) 14.5

SECTION –B

1. What is the greatest number which divides 2011 and 2623 leaving remainders 9 and 5 respectively.
2. If α and β are the Zeroes of the quadratic Polynomial f(x) = x2 –px + q , , find the value of α2 + β2 .
3. A 2 digit number is 4 times the sum of the digits and twice the product of the digits. Find the number.
4. In the given fig., AD is bisector of ∠BAC. If AB=10cm , AC =6cm and BC=12cm, find BD and DC. 
5. In the given fig., DE││AB. If AD = x-4, CD =4, CE = x-3 and BE = 3x-19. Find the value of x.
6. If sin ¾ , Prove that = .
7. Calculate the value of mode from the following data.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  Classes  | 0 -20  | 20 -40  | 40 -60  | 60 – 80  | 80 - 100  |
| Frequency  | 25  | 16  | 28  | 20  | 5  |

1. Arithmetic mean of a set of 40 values is 65. If each of the 40 values is increased by 5, what will be the mean of the set of new

 values?

SECTION—C

1. Use Euclid’s Lemma to find the H.C.F of 24 and 404 and express it as a linear combination of the two numbers.
2. Prove that the square of any positive integer is of the type 3m or 3m+1 where m is any integer.
3. If two zeroes of a polynomial are 7 and -5, find the remaining zeroes of f(x) = x4-6x3-26x2+138x-35.
4. Use cross multiplication method to solve : , . OR After five years the age of Sushma will be three times that of her son. Five years ago Sushma was seven times that of her son. What are their present ages?
5. State and prove Thales theorem
6. ABC is a triangle in which AB=AC and D   is any point in BC. Prove that AB2 – AD2 = BD. CD
7. Prove that: cot4 θ - 1 = cosec4 θ - 2 cosec2 θ.
8. If θ is an acute angle and sinθ = cosθ , find the value of 2 tan2θ + sin2θ -1.
9. Compute the median from the following data

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mid value | 115 | 125 | 135 | 145 | 155 | 165 | 175 | 185 | 195 |
| Frequency | 6 | 25 | 48 | 72 | 116 | 60 | 38 | 22 | 3 |

1. Prove that the algebraic sum of deviations of all the observations from their mean is zero. OR The mean weight of 150 students in a class is 60kg. the mean weight of the boys in the class is 70kg. and that of the girls is 55kg. Find the number of boys and girls.

SECTION –D

1. 2 Women and 5 men can together finish a piece of embroidery in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the embroidery, and that taken by 1 man alone.
2. If the polynomial f(x) = x4 – 6x3 + 16x2 – 25x + 10 -a is divided by another polynomial x2 -2x + k,the remainder comes out to x+a, find k and a.
3. The ratio of the areas of similar triangles is equal to the ratio of the squares of the corresponding sides, prove Using the above theorem, prove that the area of the equilateral triangle described on the side of the square is half the area of the equilateral

 triangle described on its diagonal. OR State and prove Baudhayan theorem.

1. Prove : ( cosecθ + cotθ )2 = 1+ 2 cot2θ + 2cosecθ cotθ .
2. If secθ = x + 1/4x , prove that , secθ + tanθ = 2x or 1/2x.

 34. Compare the mean and modal ages of two groups of candidates appearing for an entrance test:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  Age ( in years ) | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 |
| Group A ( No of candidates ) | 50 | 78 | 46 | 28 | 23 |
| Group A ( No of candidates ) | 54 | 89 | 40 | 25 | 17 |

 OR

 The distribution given below shows the weights of 30 students of a class. Find the median weight of the students and draw less than ogive.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Weight (in kg)  | 40-45  | 45-50  | 50-55  | 55-60  | 60-65  | 65-70  | 70-75  |
| No. of students  | 2  | 3  | 8  | 6  | 6  | 3  | 2  |