Class – XI
MATH SAMPLE PAPERS

Time Duration: 3 hours M.M.100

Section - A
*(Question **No 1** Compulsory and Attempt **five** other questions)*

Question 1 (3*10 = 30)

1. If $\log_{10}x = a$, find the value of 10^{2a-1} in terms of x.
2. If p(11,r) = p (12,r-1) find r
3. f:R→R be defined as f (x) = x2+1 find f^{-1} (-5) = x
4. Find the angle between the lines whose direction ratios are proportional to 4,-3,5 and 3,4,5.
5. show that $f(x) = (x-1)e^x+1$ is an increasing function on $(-\frac{\pi}{2}, \frac{\pi}{2})$
6. Evaluate $\lim_{x \to 0} \frac{cosx - cosy}{cotx - \cot y}$
7. Show that the origin is equidistance from the line 4x+3y+10 = 0;5x-12y+26=0 and 7x+24y = 50
8. Find the sum and product of the roots $3x^2-4x+9$
9. Find two positive numbers whose difference is 12 and whose A.M exceeds the G.M by 3.
10. Find the antilogartihm of a) 1.23 b) 2.5647

Question 2:

1. Evaluate the following [5m]
$\log_{10}10+\log_{10}100+\log_{10}1000+\log_{10}10000$
2. If $a^x = b^y = c^z$ and x,y,z are in G.P prove that $\log_b a = \log_c b$ [3m]
3. $a= b^2==c^3=d^4$, prove that $(abcd)= 1+ \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$ [3m]

Question 3:

1. Find the value of x and y if $\frac{x-1}{3+i} + \frac{y-1}{3+i} = i$ [5m]
2. Find the modulus and argument of the following complex number and write in polar form of $\frac{1+3i}{1-2i}$
[5m]

Question 4:

1. If a,b,c are in A.P , prove that $a^2+c^2+4ac = 2(ab+bc+ca)$ [5m]
2. Find the sum to n terms of the sequence $(x+\frac{1}{x})^2$, $(x^2+\frac{1}{x^2})^2$, $(x^3+\frac{1}{x^3})^2$,.... [3m]

3. Find the number of permutation of different things taken r at atime such that two specificed things occur together [2m]

Question 5:

1. Sketch thegraph of th egiven funstin y = 2cot2x [4m]
2. Prove tha $2\sin_2 \frac{\pi}{6} + \text{cosec}_2 \frac{7\pi}{6} \cos_2 \frac{\pi}{3} = \frac{3}{2}$ [3m]
3. Find the radian measure corresponding to degree measures: [3m]

a) 300^0 b)-56^0

Question 6:

1) Find the value of the function f (x)=1+αx , α#0 is the inverse of the function. [4m]
2) For any set A,B,C,D prove that: (AXB)n (CXD) = (AnC)X(BXD) [3m]
3) Find the center and radius of the circle x2+y2-4x+6y = 12 [3m]

Question 7:

1. Evaluate $\int sec^3 x \tan x \, dx$ [5m]
2. Find the image of the point (8,-12) with respect to the line mirror 4x+7y+13 = 0 [5m]

Question 8:

1. Find the domain of the function f (x) given by f(x) = $\frac{1}{log10(1-x)} + \sqrt{x+2}$ [5m]
2. If f(x) = cos (logx), then find the value of f(x) f(y)- $\frac{1}{2}$ [f(x/y)+f(xy)] [5m]

Section - B

(Attempt any two questions)

Question 9:

1. Determine the values of x for which $f(x) = x^x$, x>0 is increasing or decresing [4m]
2. Find the derivative of the function using first principles: cot√x [3m]
3. Discuss the differentation of $f(x) = x^{|x|}$ at x = 0 [3m]

Question 10:

1. The mean and standard deviation of 15 observation are found to be 8 nad 10 respectively. On rechecking it was found that an observtaion 4 was incorreect. Calculate the correct mean and standard deciaton in of the cases. [5m]
2. Calculate the median of the given tabel [5m]

variables	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	46	32	36	60	54	62

Question 11:

1. Find the average due date of the follwing bills: [5m]

Amount of the bill (Rs)	Date of acceptance of the bill	Period of the bill
5000	10-1-2013	3 months
4500	12-2-2013	2 months
3000	15-3-2013	1 months
2000	20-3-2013	2 months
1000	10-5-2013	3 months
750	13-6-2013	2 months

2. Find the median of the following distribution [5m]

x:	0	1	2	3	4	5	6
f:	15	35	60	84	96	127	198