LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **MATHEMATICS**

FIRST SEMESTER – NOVEMBER 2012

# MT 1500 - ALGEBRA, ANALY. GEO., CALCULUS & TRIGONOMETRY

 Date : 08/11/2012 Dept. No. Max. : 100 Marks

 Time : 1:00 - 4:00

**PART – A**

**Answer ALL the questions: (10 x 2 = 20 marks)**

1. Write the nth derivative of 
2. If y = a show that 
3. Define the evolute of a curve.
4. Find the p-r equation of the curve r = a sin θ.
5. Determine the quadratic equation having 3 – 2 i as a root.
6. Diminish the roots of by 2.
7. Show that 
8. Express in locus of logarithmic function.
9. Define a rectangular hyporbola.
10. Write down the angle between the asymptotes of the hyperbola 

**PART – B**

**Answer any FIVE questions: (5 x 8 = 40 marks)**

1. Show that in the parabola the subtangent at any point is double the abscissa and the subnormal is a constant.
2. Find the radius of curvature at the point ‘O’ on 
3. Show that if the roots of 
4. Find the p-r equation of the curve with respect to the focus as the pole.
5. Separate into real and uniaguinary parts.
6. Find the sum of the series 
7. Find the locus of poles of ale Laugets to with respect to 
8. Derive the polar equation  of a comic.

**PART – C**

**Answer any TWO questions: ( 2 x 20 = 40 marks)**

1. a) If prove that 

b) Show that r = a sec2  and r = b cosec2  intersect at right angles.

 20. a) Find the minimum value of 

 b) Find the radius of curvature of .

 21. a) Solve: given that the roots are in geometric progression.

 b) Solve: .

 22. a) Express cos8θ in locus of power of sinθ.

 b) If e1 and e2 are the eccentricities of a hyperbola and its conjugate show that .

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