LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – NOVEMBER 2012

# MT 2501/2500 - ALGEBRA, ANAL.GEO & CALCULUS - II

Date : 07/11/2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART-A**

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

1. Evaluate 
2. Evaluate 
3. Verify whether is exact?
4. Solve 
5. Prove that the series  is convergent.
6. Find the values of k for which the series converges.
7. Prove that 
8. Using binomial expansion, find the value of  correct to two decimal places.
9. Find the direction cosines of the line 
10. Find the centre and radius of the sphere

**PART-B**

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

1. Evaluate 
2. Prove that the area and the perimeter of the cardioids  are and respectively.
3. Solve 
4. Solve 
5. Using D’Alembert’s ratio test, examine the convergence of the series 
6. Prove that 
7. When is small , prove that approximately.
8. Find the equation of the plane passing through and and perpendicular to the plane 

**PART-C**

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

1. a) Evaluate 

b) Define the length of the curve and find the length of one loop of the curve 

1. a) Solve  when 

b) Apply the method of variation of parameters to solve 

1. a) Using Rabee’s test, Examine the convergence and divergence for the series 

b) Prove that 

1. a) Prove that the lines  and are coplanar. Find the point of intersection .Also find the equation of the plane determined by the lines.

b) Find the equation of the sphere passing through the points,and having the centre of the sphere on the line 

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