**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

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

**SECOND SEMESTER – APRIL 2012**

**MT 2501/MT2500- ALGEBRA,ANALYTICAL GEOMETRY AND CALCULUS**

**Date: 16-04-2012 Dept. No. Max. : 100 marks**

**Time: 9.00 – 12.00**

**PART-A**

**ANSWER ALL QUESTIONS:** (10**×2 =20)**

1. Evaluate .
2. Find x dx.
3. Define exact differential equations.
4. Solve (D2 2D + 1) y = 0.
5. Show that the series is convergent.
6. State Cauchy root test for convergence of a series.
7. Find the coefficient of in the expansion of 1 + + + + ...
8. Prove that
9. Find the direction cosines of the line joining the points (3,-5,4) and (1,-8,-2).
10. Find the angle between the planes and .

**PART –B**

**ANSWER ANY FIVE QUESTIONS: (5×8=40)**

1. Evaluate
2. Find the surface area of the solid formed by revolving the cardiod about the initial line.
3. Solve
4. Solve .
5. Examine the convergence of

 16. Assuming that the square and the higher powers of x may be neglected

 show that

17. Sum to infinity the series

18. Find the shortest distance between the linesand and the equation of the line.

**PART - C**

**ANSWER ANY TWO QUESTIONS: (2×20= 40)**

19. (a) Evaluate .

 (b) Find the length of the curve between the points given by and.

20. (a) Solve

 (b) Solve the following equation by the method of variation of parameter:

.

21. (a) Test the convergence of the series

 (b) Find the equation of the sphere passing through the points (2,3,1),(5,-1, 2),
(4,3,-1) and (2,5,3).

22. (a) Show that

 (b) Sum the series

**$$$$$$$**