LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **CHEMISTRY**

FIRST SEMESTER – NOVEMBER 2012

# MT 1102 - MATHEMATICS FOR CHEMISTRY

Date : 03/11/2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

# Part A

Answer ALL questions: (10 x 2 =20)

1. Differentiate with respect to .
2. Find the slope of the tangent at to the curve
3. Change the limits of as lower limit to and upper limit to .
4. Solve .
5. State Binomial theorem.
6. Solve the partial differential equation .
7. State DeMoivre’s theorem.
8. Show that
9. From a well-shuffled pack of 52 cards, one card is drawn at random. What is the probability that it will be (i) a jack (ii) a spade?
10. Define Normal distribution.

# Part B

Answer any 5 questions: (5 x8 = 40)

1. Find the angle of intersection of the cardioids and

.

1. If , then show that .
2. Evaluate: (i), using Bernoulli’s formula.

(ii) Evaluate: . (4+4)

1. Solve the differential equation .
2. Find the sum of the series
3. If , then show that
4. Obtain the expansion of .
5. Find the maxima and minima of the function .

# Part C

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

1. (i) Evaluate:

(ii) Prove that . (10+10)

1. (i)Obtain the characteristic roots and the associated characteristic vectors of the

matrix .

(ii) Solve the partial differential equation with usual notations. (15+5)

1. Given that in the interval 0 to . Find the Fourier coefficients and .Hence deduce that .
2. (i)Expand in series of cosines of multiples of .

(ii)The mean mark of students were found to be 40. Later it was observed that a score of 53 was misread as 83. Find the correct mean using the correct score.

(14+6)