LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2012**

# MT 3103 - MATHEMATICS FOR CHEMISTRY

 Date : 28-04-2012 Dept. No. Max. : 100 Marks

 Time : 9:00 - 12:00

**Part A. Answer all the questions. Each question carries two marks. (10 x 2 = 20)**

1. Find  for x = a(+sin ); y = a(1-cos),
2. Find  if 
3. Evaluate 
4. Evaluate 
5. Prove that 
6. If 
7. If, show that the angle  is 3o approximately
8. Prove that sinh 3x = 3 sinh x + 4 sinh3 x
9. If the probability of defective bolt is 0.1; find the mean and standard deviation for the distribution of defective bolts in a total of 500.
10. What are the significance of normal distribution.

**Part B. Any 5 questions only. Each question carries 8 marks. (5 x 8=40)**

1. Find the equation of the tangent and normal for y2= 4ax at (at2,2at).
2. Prove that the tangents to the curve y = x2 -5x + 6 at the points (2,0) and (3,0) cut at right angles.
3. Solve (3D2- 4D + 5) y = 3 e2x
4. Prove that 
5. If x is large, prove that  nearly.
6. Prove that 
7. Find the standard deviation for the following data:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Age (x) | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 |
| No of frequencies (f) | 170 | 110 | 80 | 45 | 40 | 35 |

1. Ten percent of the tools produced in a certain manufacturing process turn out to be defective. Find the probability that in a sample of 10 tools chosen at random, exactly two will be defective by using (a) Binomial distribution and (b) the Poisson approximation to the binomial distribution.

**Part C. Any two questions only. Each question carries 20 marks. (2 x20 = 40)**

1. a) Prove that 

19) b) Solve xp + yq = x

20)a) Evaluate 

20)b) Evaluate 

21) Find the Fourier series to the function f(x) = in the interval (0,2).

1. a) Find the maximum or minimum values of xy + 1**/**x +1**/**y.

22) b) A family has six children. Find the probability P that there are (a) three boys and three girls and (b) fewer boys than girls.

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