6. (a) Find real root of the equation by bisection method correct to 3 decimal places : **7**

$$x^3 - 9x + 1 = 0$$

(b) Using Newton-Raphson formula, find the value of $\sqrt[4]{32}$. **8**

Unit IV

7. (a) Solve the equation by trinagularization (LU decomposition) method : **8**

$$2x_1 + 3x_2 + x_3 = 9$$
$$x_1 + 2x_2 + 3x_3 = 6$$
$$3x_1 + x_2 + 2x_3 = 8$$

(b) Solve the equation by Gauss-Elimination method : **7**

$$4x + 3y + 2z = 8$$
$$x + y + z = 7$$
$$3x + 2y + 4z = 13$$

8. (a) Solve the equation by Jacobi's method : **7**

$$10x + y + z = 12$$
$$2x + 2y + 10z = 14$$
$$2x + 10y + z = 13$$

DD-343

Dual Degree B.Sc. (Hons.)

EXAMINATION, May 2018

(Fourth Semester)

(Main & Re-appear)

MATHEMATICS

MAT316H

Probability Distributions and Numerical Methods

Time : 3 Hours]   [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : The question paper will consists of four units. Each unit will contain two questions and the student shall be attempt the total *Five* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Define Binomial distribution and find out the formula for the mean and variance of Binomial distribution. **8**

(b) If in a lot of 500 solenoids 25 are defective, find the probability of 0, 1, 2, 3 defective solenoids in a random sample of 20 solenoids. **7**

2. (a) Define moment generating function and prove a random variable X may have no moments although its m.g.f. (moment generating functions) exists. **8**

(b) Define cumulant and if μ'_r is the rth moment about origin prove that : **7**

$$\mu'_r = \sum_{j=1}^{r} \binom{r-1}{j-1} \mu'_{r-j} k_j$$

where k_j is jth cumulant.

Unit II

3. (a) State Central limit theorem and give its applications. **8**

(b) If the probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2,000 individuals more than two will get a bad reaction. **7**

4. (a) Define Poisson distribution. Find out formula for the mean and variance of Poisson distribution. **7**

(b) The mean heights of 500 students is 151 cm and S.D. is 15 cm. Assuming that the heights are normally distributed, find how many students heights lie between 120 and 155 cm. **8**

Unit III

5. (a) Find the real root of the equation by Regula-Falsi method correct to three decimal places : **8**

$$3x - \cos x - 1 = 0$$

(b) Find real root of the equation by Newton-Raphson method correct to 3 decimal places : **7**

$$x^3 - 2x - 5 = 0$$

(b) Solve the equations by Relaxation method : **8**

$$10x - 2y - 3z = 205$$
$$-2x + 10y - 2z = 154$$
$$-2x - y + 10z = 120$$