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DATE: 19-04-2018

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

B.Sc. STATISTICS - II SEMESTER

SEMESTER EXAMINATION – APRIL 2018

**ST 216: Theoretical Probability Distributions and Limit Theorems**

**(FOR SUPPLEMENTARY CANDIDATES ONLY)**

Do not write the register number on the question paper

Please attach the question paper along with the answer script

**Time: 2½ Hours Max: 70 Marks**

This question paper has **TWO** printed pages and **THREE** parts.

**PART – A**

**I Answer any FIVE of the following: 5 x 3 = 15**

1. Define Probability mass function and cumulative distribution function of a random variable
2. Define a random variable and explain the different types of random variables with examples.
3. Define Poisson random variable and give two examples for it.
4. Which are the two distributions that have same mean and variance and what are those?
5. Mention any three applications of Normal distribution.
6. Mention any three advantages of simulation.
7. State week law of large numbers

**PART – B**

**II Answer any FIVE of the following: 5 x 7 = 35**

1. A) Derive mean of binomial distribution (4)

B) Define Sample, Statistic and Parameter (3)

1. A) Show that sum of two independent Poisson variate is also Poisson variate (4)

B) What are the relationship between Bernoulli, binomial and Poisson distribution?(3)

1. A) Obtain recursive relationship for Geometric probabilities. (3)

B) Write down the probability density function for continuous uniform distribution on support 0 to 5 and derive variance of it (4)

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1. A) Find the mean of Exponential Distribution with mean Ɵ. (3)

B) Write down any four properties of Normal distribution and prove any one of it. (4)

1. A) Under what conditions the sum of two independent binomial variates with parameter (n1,p1) and (n2,p2) is a binomial variate (3)

B) Derive the sampling distribution of sample variance (4)

1. A) State and prove memory less property of Geometric Distribution. (5)

B) Write down density function for standard normal distribution (2)

1. A) Define convergence in probability (4)
2. Monte Carlo method of simulation. (3)

**PART – C**

**III Answer any TWO of the following: 2 x 10 = 20**

1. A) Give recurrence relationship for probabilities for Binomial Distribution (4)

B) State and prove additive property of exponential distribution. (4)

C) Define Hyper Geometric Distribution (2)

1. A) State Chebychev’s inequality (3)

B) Define of Gamma distribution and obtain mean of it (5)

C) What is standard error? And state its uses. (2)

1. A) What do you mean by sampling distribution? (3)

 B) If X1,X2…..Xn be a random sample from N(µ,σ2), then find the distribution of

sample mean ($\overbar{x}$) (4)

1. State Linder-berg Levy central limit theorem (3)

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