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Register Number:

DATE:19-04-2018 (9AM)

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

B.Sc. STATISTICS - II SEMESTER

SEMESTER EXAMINATION – APRIL 2018

**ST 217: Theoretical Probability Distributions**

**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: 5x 3= 15**

1. Mention any three characteristics of Bernoulli distribution.
2. Prove that the area of Normal distribution is equal to 1.
3. Define i) Parameter ii) Standard error iii) Standard error of sample mean
4. Define Statistic and sampling distribution (1+2)
5. A random variable has an exponential distribution with probability density function given by f(x) = $\left\{\begin{array}{c}2e^{-2x} for x\geq 0\\0 elsewhere\end{array}\right.$Find the probability that X is not less than 2?
6. Define Reliability and Survival Function.
7. Write a note on Census.

**PART – B**

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

1. A) Prove that $\sum\_{x=0}^{\infty }P(X=x)$ =1 for Poisson distribution. (3)

B) Obtain the moment generating function of Exponential Distribution and hence find its mean. (4)

1. A) Obtainthe recurrence relationship for the probability of Negative Binomial Distribution (5)

B)StateInter relationships betweenBernoullie,Binomial and Poisson (2)

1. A) Find the mean for discrete Uniform Distribution. (2)

B) Derive the mean and variance of Geometric Distribution. (5)

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1. A) Define Normal Distribution and give any four properties of it. (3)

B) Find the mean of Beta distribution of 2nd kind. (4)

1. A) State and prove additive property of Gamma Distribution. (4)

B) Define chi-squarevariate and obtain the mean of it (3)

1. A) Define ***F*** – statistic under normality assumption. (2)

 B)Derive sampling distribution of sample variance (5)

1. A)Show that Hazard function for exponential distribution is constant.(5)

B) Define population and sample (2)

**PART – C**

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

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

 B) State and prove memory less property of Exponential Distribution. (4)

 C)Define standard normal variate (2)

1. A) Define student’s ***t***distribution and give any four properties of **t-**distribution. (6)

B) If X1,X2…..X20 be a random sample from N(10, 25), then find the mean and variance of sample mean (4)

1. A) Define Hyper Geometric Distribution along with its mean and variance with usual notations (4)

B) Write a note on pilot survey and mention any three advantages of it. (6)

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