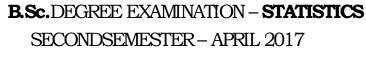
LOYOLA COLLEGE (AUTONOMOUS), CHENNAI - 600 034



ST 2503- CONTINUOUS DISTRIBUTIONS

Date: 04-05-2017 01:00-04:00

Answer ALL Questions

Dept. No.

Max.: 100 Marks

SECTION-A

10X2=20 MARKS

- 1) Write the significance of Normal distribution.
- 2) Write the mean and variance of Uniform distribution.
- 3) Obtain the distribution function F(x) for exponential distribution.
- 4) Write any two properties of the sampling distribution of 't'
- 5) Define Gamma distribution.
- 6) When two random variables are said to be stochastically independent?
- 7) Define order statistics.
- 8) Define marginal distribution function.
- 9) Define Convergence in Probability.
- 10) Define Bivariate Normal Distribution.

SECTION - B

AnswerAny FIVE Questions

5X8=40 MARKS

11) The joint p.d.f. of a two dimensional random variable (x, y) is given by

f(x,y) = 2 0 < y < x < 1

0 elsewhere

a. Find the marginal density function of X.

b Find the conditional density function of Y/(X=x).

- 12) Derive the moment generating function of Exponential distribution.
- 13) Define standard Cauchy distribution if X_1 and X_2 are i.i.d. N(0,1) variables obtain the pdf of

$$y_1 = \frac{X_1}{X_2}.$$

- 14) Define chi-square variate and give the application of chi-square distribution.
- 15) Write the pdf of Beta distribution of first kind and second kind. Obtain the Harmonic mean for first Kind.
- 16) Find the distribution of Range.

17) State and Prove the linearity property of Normal distribution.

18) Define Conditional Expectation and Conditional Variance.

SECTION-C

Answer Any TWO Questions

19) a. State and Prove Lindberg- Levy central limit theorem.

b. Let $X_1, X_2, \ldots X_n$ be a random sample from exponential distribution. Obtain the distribution of

$$i = \frac{\sum_{i=1}^{n} X_{i} - nE(X_{i})}{\sqrt{nv(X_{i})}}$$
(5)

20) a. Students of class were given an aptitude test. Their marks were found to be normally distributed with mean 60 and Standard Deviation 5 What percentage

of student scored

More than 60 marks

Less than 50 marks

Between 45 and 65 marks

b. Write the characteristics of Normal distribution.

21) a. Obtain the moment generation function of chi-square distribution (10)

b. Let X_1 and X_2 be independent random variables with Gamma distribution and parameters m and n respectively.

Obtain the joint pdf of
$$y_1 = X_1 + X_2$$
 and $y_2 = \frac{X_1}{X_1 + X_2}$ (10)

22) a. Derive the pdf of t-distribution.

b. Obtain the mode of F-distribution.

2X20=40 MARKS

(15)

(15)

(5)