**B.Sc. DEGREE EXAMINATION, NOVEMBER 2016.**

**II YEAR — III SEMESTER**

**Major Paper V — DISTRIBUTION THEORY - II**

**Time : 3 hours Max. Marks : 60**

**SECTION A — (10 × 1 = 10 marks)**

**Answer any *TEN* questions.**

1. State the variance of Beta distribution [B(µ, ν)] of second kind.
2. Write down the M.G.F of exponential distribution.
3. Give the characteristic function of standard Laplace distribution.
4. State the M.G.F of Logistic distribution.
5. Write down the mean and variance of χ2­ distribution.
6. Define additive property of χ2 – variates.
7. Give the variance of t – distribution.
8. State the p.d.f of Snedecor’s F-distribution with (ν1, ν2) d.f.
9. Write down the c.d.f of Fr(x).
10. State the p.d.f of a single order statistic.
11. Define c.g.f of Gamma distribution.
12. Define p.d.f of two parameter Laplace distribution.

**SECTION B — (5 × 4 = 20 marks)**

**Answer any *FIVE* questions.**

1. Derive the mean and variance of Exponential distribution.
2. Explain moments of standard Weibul distribution.
3. Derive the M.G.F of χ2 distribution.
4. Describe limiting form of t-distribution.
5. Show that, for a random sample of size 2 from N(0, σ2) population, then

 E[X(1)] = -σ/$\sqrt{π}$ .

1. Explain additive property of Cauchy distribution.
2. State the properties of Pareto distribution.

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. If *X~ N(µ, σ2),* obtain the *p.d.f* of $U=\frac{1}{2}\left(\frac{X-μ}{σ}\right)^{2}$.
2. Explain moments of two parameter Laplace distribution.
3. Show that, if *X1, X2*, are two independent χ2 – variates with *n1*, and *n2 d.f*

respectively, then *X1/ X2* is a β2(n­1/2, n2/2) variate.

1. X is a binomial variate with parameters n and p and $F\_{ϑ\_{1},ϑ\_{2}}$is a F-statistic with $ ϑ\_{1} and ϑ\_{2}d.f$. Prove that:

 $P(X\leq k-1)=P\left[F\_{2k,2(n-k+1)}>\frac{n-k+1}{k}.\frac{p}{1-p}\right]$.

1. Derive the joint p.d.f of two order statistics.

**———————**