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Statistics Department

Assignment – No. – 02 ***Paper – STA - 301***

1. Define power series distribution.
2. In usual notations, derive the recurrent relation for the central moments of power series distribution.
3. Derive the Binomial distribution and its m.g.f as a special case of power series distribution.

4.For power series distribution, show that $\mu_1^/ = \frac{\theta f'(\theta)}{f(\theta)}$ and $\mu_2^/ = \frac{\theta^2 f''(\theta)}{f(\theta)} + \frac{\theta f^/(\theta)}{f(\theta)}$

5. In usual notations, derive the recurrent relation for cumulants of power series distribution.
6. Define i) order statistics, ii) smallest order statistics, iii) rth order smallest order statistics, iv) smallest order statistics, sample range.
7. Derive joint probability density function of order statistics.

8.Obtain the distribution of the largest order statistics.

9. If p.d.f. of a r.v. is $f(x) = \begin{cases} 1 & , o \le x \le 1 \\ 0 & , otherwise \end{cases}$, then obtain the distribution of the smallest order statistics and a sample range.

10. Using power series distribution, derive mean and variance of Bernoulli distribution.
11. State two applications of order statistics.
12. For a power series distribution, derive recurrent relation for raw moments.
13. Derive the Poisson Distribution and its mean and variance as a special case of power series distribution.
14. For a power series distribution, derive recurrent relation for cumulants.
15. Derive Binomial Distribution from a power series distribution.
16. For a Negative Binomial Distribution, using power series distribution, obtain m.g.f and cumulants.
17. For a p.d.f. f(x) = e^{-x} ; $x > 0$, find the p.d.f. of largest order statistics.
18. Obtain distribution of the smallest order statistics.
19. Obtain the distribution of sample range.
20. Let a random sample of size 4 is taken from U(0,1), find p.d.f. of (i) Smallest order statistics, (ii) sample range.
