

Assignment - I

Dr. Delta
Pg.:

Q.1 Prove that Poisson distribution is limiting case of Binomial as well as Negative Binomial Distribution.

Q.2 Show that in Poisson distribution with unit mean, mean deviation about unit mean is $2/e$ times the standard deviation.

Q.3 If X is negative binomial variate with pmf.

$$f(x) = \begin{cases} \binom{k+x-1}{x} q^x p^k & x=0, 1, 2, \dots \\ 0 & \text{otherwise} \end{cases}$$

then prove that recurrence formula for moments is

$$\mu_{x+1} = q \left[\frac{d\mu_x}{dq} + \frac{qk}{p^2} \mu_{x-1} \right]$$

Q.4 i) $n=100$, $\beta_1 = \frac{1}{15}$, $\beta_2 = \frac{89}{30}$ - Determine the binomial distribution.

ii) Between a binomial distribution with $n=5$, $p=1/2$ and a distribution with frequency function $f(x) = 6x(1-x)$; $0 \leq x \leq 1$, determine which is more skewed.

iii) If X and Y are two independent binomial variates with parameters $n_1=3$, $p=0.4$ and $n_2=4$, $p=0.4$ respectively then find

a) $P(X=Y)$ b) $P(X+Y \leq 2)$

c) $P(X=3 | X+Y=4)$