Question #72702, Math / Statistics and Probability

Solution: - Here we have to make an assumption that number of accidents at a certain intersection follows Poisson distribution. Let X be the random variable denoting the number of accidents in a month at a particular intersection.

So, here X ~ Poisson (3) since, mean is given to be 3.

$P(X=a) = (e^{-3}\, 3^a)/a!$

We need to find probability of

a) Exactly 5 accidents: - $P(X=5) = (e^{-3}\, 3^5)/5!$

b) Fewer than 3 accidents occur: -

$P(X=0) + P(X=1) = e^{-3} + 3e^{-3}$
$= 4e^{-3}$

c) At least two accidents occur: -

$P(X\geq 2) = 1 - P(X=0) - P(X=1)$
$= 1 - e^{-3} - 3e^{-3}$
$= 1 - 4e^{-3}$