82. Solution: B

Let $X_1, \ldots, X_{1250}$ be the number of claims filed by each of the 1250 policyholders. We are given that each X_i follows a Poisson distribution with mean 2 . It follows that $E[X_i] = Var[X_i] = 2$. Now we are interested in the random variable $S = X_1 + \ldots + X_{1250}$. Assuming that the random variables are independent, we may conclude that S has an approximate normal distribution with $E[S] = Var[S] = (2)(1250) = 2500$.

Therefore $P[2450 < S < 2600] =$

$$P\left[\frac{2450-2500}{\sqrt{2500}} < \frac{S-2500}{\sqrt{2500}} < \frac{2600-2500}{\sqrt{2500}}\right] = P\left[-1 < \frac{S-2500}{50} < 2\right]$$

$$= P\left[\frac{S-2500}{50} < 2\right] - P\left[\frac{S-2500}{50} < -1\right]$$

Then using the normal approximation with $Z = \frac{S-2500}{50}$, we have $P[2450 < S < 2600]$

$\approx P[Z < 2] - P[Z > 1] = P[Z < 2] + P[Z < 1] - 1 \approx 0.9773 + 0.8413 - 1 = 0.8186$.