Question # 90
Answer: E

The distribution of claims (a gamma mixture of Poissons) is negative binomial.

$$E(N) = E_{\wedge}\left(E(N|\Lambda)\right) = E_{\wedge}(\Lambda) = 3$$
$$Var(N) = E_{\wedge}\left(Var(N|\Lambda)\right) + Var_{\wedge}\left(E(N|\Lambda)\right)$$
$$= E_{\wedge}(\Lambda) + Var_{\wedge}(\Lambda) = 6$$
$$r\beta = 3$$
$$r\beta(1+\beta) = 6$$
$$(1+\beta) = 6/3 = 2; \quad \beta = 1$$
$$r\beta = 3$$
$$r = 3$$

$$p_0 = (1+\beta)^{-r} = 0.125$$
$$p_1 = \frac{r\beta}{(1+\beta)^{r+1}} = 0.1875$$
$$\text{Prob}(\text{at most } 1) = p_0 + p_1$$
$$= 0.3125$$