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SAC 208: RISK THEORY

1. (a) The number of claims from a policy in a year is either 1 with probability 0.8, 2 with probability 0.1 or 3 with probability 0.1. If a claim occurs, the benefit amount is 4, 8 or 10 with probability 0.4, 0.4 and 0.2. Determine the mean and variance of the aggregate claim amount.
(7 Marks)

   (b) The number of road accidents per year at a certain freeway intersection has a Poisson distribution with parameter 50. When an accident occurs, the number of injured persons has the following distribution.

No. of injured	Probability
0	0.6
1	0.2
2	0.1
3	0.1

   Find the probability that there will be more than 50 injuries in a year.
(7 Marks)

2. (a) The random variable X+4 has a negative binomial distribution with parameters (0.2,4). The mean and the variance of X are?

(8 Marks)

   (b) Define S to be $X_1 + X_2 + ... + X_N$. It is known that both N and X have a Poisson distribution with parameters λ_1 and λ_2 respectively. Find the expression for the MGF of S.
(8 Marks)

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