An auto insurance company is implementing a new bonus system. In each month, if a policyholder does not have an accident, he or she will receive a $5.00 cash-back bonus from the insurer. Among the 1,000 policyholders of the auto insurance company, 400 are classified as low-risk drivers and 600 are classified as high-risk drivers. In each month, the probability of zero accidents for high-risk drivers is 0.80 and the probability of zero accidents for low-risk drivers is 0.90. Calculate the expected bonus payment from the insurer to the 1,000 policyholders in one year.

A. 48,000 B. 50,400 C. 51,000 D. 54,000 E. 60,000

Solution.
In one year, the expected bonus for a high-risk driver is $12 \cdot 0.8 \cdot 5 = 48$. The expected bonus for a low-risk driver is $12 \cdot 0.9 \cdot 5 = 54$. The total expected bonus payment from the insurer is:

$$600 \cdot 48 + 400 \cdot 54 = 50,400.$$ 

Answer B.

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