

For a special whole life insurance policy issued on (40), you are given:

- (i) Death benefits are payable at the end of the year of death.
- (ii) The amount of death benefit is 2 if death occurs within the first 20 years and is 1 thereafter.
- (iii) Z is the present value random variable for the payments under this insurance

(iv) $i = 0.03$

(v)

x	A_x	${}_{20}E_x$
40	0.36987	0.57276
60	0.62567	0.17878

(vi) $F(22) = 0.24954$

Calculate the standard deviation of Z .

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Consider the following two present value random variables:

$$Z_1 = \begin{cases} 100000 v^{T_x}; & T_x \leq 15 \\ 200000 v^{15}; & T_x > 15 \end{cases}$$

$$Z_2 = \begin{cases} 0; & T_x \leq 5 \\ 10000 v^{T_x}; & 5 < T_x \leq 15 \\ 10000 v^{15}; & T_x > 15 \end{cases}$$

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a/ Describe the insurance policies represented by z_1 and z_2 .

b/ Express $E(z_1)$ and $E(z_2)$ using actuarial symbols

c/ You are given that, at an effective rate of interest of 6% per year, $\bar{A}_x = 0.166117$
 $\bar{A}_{x+5} = 0.20718$; $\bar{A}_{x+15} = 0.314208$.

You are also given that $l_x = 93132$

$$l_{x+15} = 86409$$

Calculate $E(z_1)$, $E(z_2)$?

3/ Using the Illustrative life Table with $i = 0.06$,
Find $A^1_{50:\overline{6}|}$

4/ You are given

(i) $A_{60} = 630$

(ii) $P_{60} = P_{61} = 0.9$

(iii) $i = 0.05$

Find A_{62} .

5/ Using the Illustrative life Table with $i = 0.06$,
Find $A_{40:\overline{20}|}$