

7.40 For a fully discrete whole life insurance of 1000 on (60), you are given:

- i) Reserves are determined using a modified net premium reserve method
- ii) The modified reserve at the end of year 2 is 0
- iii) Valuation premiums in years 3 and later are level
- iv) Mortality follows the Standard Ultimate Life Table
- v) $i = 0.05$

Calculate the modified net premium reserve at the end of year 5.

- (A) 58
- (B) 69
- (C) 79
- (D) 90
- (E) 99

[Question on October 2022 FAM-L Exam]

18.1. An insurer is modelling time to death of lives insured at age x using the Kaplan-Meier estimator. You are given the following information.

- (i) There were 100 policies in force at time 0
- (ii) There were no new policies entering the study
- (iii) At time 10.0, immediately after a death, there were 50 policies remaining in force
- (iv) The Kaplan-Meier estimate of the survival function for death at time 10 is $\hat{S}(10.0) = 0.92$
- (v) The next death after time 10.0 occurred when there was one death at time 10.8
- (vi) During the period from time 10.0 to time 10.8, a total of 10 policies terminated for reasons other than death

Calculate $\hat{S}(10.8)$, the Kaplan-Meier estimate of the survival function $S(10.8)$.

- (A) 0.897
- (B) 0.903
- (C) 0.909
- (D) 0.910
- (E) 0.920

- 18.9** Initially, 80 lives are included in an observation of survival times following a specific medical treatment. You are given excerpted information from the study data in the table below.

j	$t_{(j)}$	Deaths at $t_{(j)}$	Exits (other than death) in $(t_{(j)}, t_{(j+1)}]$	Entrants in $(t_{(j)}, t_{(j+1)}]$
0			20	4
1	0.5	1	2	3
2	1.6	1	6	0
3	1.9	1	8	0
4	2.5	1	10	0

Calculate the Kaplan-Meier estimate of $S(2)$.

- (A) 0.931
- (B) 0.952
- (C) 0.960
- (D) 0.969
- (E) 0.972

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