

7.1 For a whole life insurance issued to (40), you are given:

- i) The death benefit which is payable at the end of the year of death is \$50,000 in the first 20 years, and \$100,000 thereafter.
  - ii) Level annual premiums are payable for 20 years or until earlier death.
  - iii) The mortality basis Standard Ultimate Survival Model (Table D).
  - iv) The interest basis for policy values is 5% per year.
- Calculate the net premium policy value,  ${}_{10}V^t$

7.8 You are given the following extract from a select life table with four year select period. A select individual aged 41 purchased a three-year term insurance with a sum insured of \$200,000, with premiums payable annually throughout the term.

$[x]$	$l_{[x]}$	$l_{[x]+1}$	$l_{[x]+2}$	$l_{[x]+3}$	$l_{x+4}$	$x+4$
[40]	100000	99899	99724	99520	99288	44
[41]	99802	99689	99502	99283	99033	45
[42]	99597	99471	99628	99030	98752	46

Assume an effective rate of interest of 6% per year, and no expenses.

- (a) Show that the premium for the term insurance is  $P = \$323.59$ .
- (b) Calculate the mean and standard deviation of the present value of future loss random variable,  $L_1$ , for the term insurance.
- (c) Calculate the sum insured for a three-year endowment insurance for a select life age 41, with the same premium as for the term insurance,  $P = \$323.59$ .
- (d) Calculate the mean and standard deviation of the present value of future loss random variable,  $L_1$ , for the endowment insurance.
- (e) Comment on the differences between the values for the term insurance and the endowment insurance.