Sample Study Guide – Cover Letter

The ACE manual was designed with the intent of clarifying complex text (and problems) with explanations in plain-English. This is accomplished via clear and concise summaries of each chapter, author's commentaries for the most difficult ("Greek") material, ACE original problems, and more in-depth explanations and answers to some of the problems that are in the book. The study guide has calculations and practice problems integrated with the outline to facilitate learning.

In this sample we provide a chapter from the manual, along with a page from the formula list.

We would also like to put in a plug for the ACE life and online seminars. This will be an excellent opportunity for you to enhance your understanding of the syllabus. We will walk through book examples, outline key material, walk through old exam problems, and present ACE SOA type problems. The seminar will combine similar texts so you can learn/review the syllabus in a reasonable amount of time.

Please contact us with any questions at *customerservice@acemanuals.com*

Standard Nonforfeiture Law for Individual Life Insurance (LP-122-13)

Key Concepts
- Traditional products in the US use a prospective method for calculating minimum nonforfeiture amounts
- This is a rules based formula
- The expense allowance will decrease the nonforfeiture amount

The syllabus only covers sections 1-4, 5c, and 6-9. Keep in mind that this applies to traditional products – NOT UL products.

1) Non-forfeiture benefits
   a) A life insurance contract must contain the following provisions
      i) In the event of default of premium payment, the company will provide a paid up non-forfeiture benefit. The company may provide an equivalent non-forfeiture benefit (such as cash surrender) if requested.
      ii) If the policyholder surrenders a policy in which premiums have been paid for at least 3 years (5 for industrial insurance) or in which premiums have been paid up, the company will pay the cash surrender value.
      iii) The policyholder has 60 days to elect a non-forfeiture option (or they will get the default option)
      iv) Must disclose the mortality table and interest rate used to the policyholder
      v) Must show cash surrender value and paid up benefit for the first 20 policy durations for policies with guaranteed premiums and benefits (also to the policyholder)
      vi) Must disclose that the non-forfeiture benefits are not less than required minimums (Once again, this is disclosed to the policyholder)
      vii) Must disclose how paid-up additions and policy loans will affect the non-forfeiture values
   b) A company may delay payment of cash surrender value for up to 6 months

2) Computation of cash surrender value
   a) Cash Surrender Value =
      i) PV(Guaranteed Benefits, including any paid up additions)
      ii) − PV(Adjusted Premiums)
      iii) − Any Amount of indebtedness (e.g. loans)
   b) If there are riders, the cash surrender value should be the sum of the base policy and any cash surrender values for the riders
      i) Calculate the rider cash surrender value as though it was a stand-alone policy
   c) For paid up policies, the cash surrender value =
      i) PV(Guaranteed Benefits, including any paid up additions)
      ii) − Any Amount of indebtedness (e.g. loans)

Keep in mind that cash value is one type of non-forfeiture benefit.

3) Computation of paid-up non-forfeiture benefits
   a) The PV of paid up non-forfeiture benefits should be greater than or equal to the minimum cash surrender value

4) Calculation of adjusted premiums
   a) Calculation of adjusted premiums by the non-forfeiture net level premium method
      i) Net level premium formula
         (1) Adjusted Premium = Constant % * Gross Premiums
         (2) Exclude policy fees from the gross premium
         (3) PV(Adjusted premiums) = PV(Guaranteed Benefits) + (0.01 * Face) + 1.25 * Min(0.04 * Face, Net level premium)
         (4) [(0.01 * Face) + 1.25 * Min(0.04 * Face, Net level premium)] is the "expense allowance"

(5) If the face amount is not level, then replace "Face" with the average face at the beginning of each of the first 10 policy years

(6) ALL PRESENT VALUES ARE AS OF THE ISSUE DATE

  ii) Alternative formula

    (1) Adjusted Premium = [PV(Guaranteed Benefits) + EA] / $\ddot{a}_x$

  iii) For policies with non-guaranteed benefits and premiums:

    (1) Initially calculate non-forfeiture benefits assuming no change in premiums or benefits

    (2) If premiums or benefits do change, recalculate adjusted premium assuming no more changes

    (3) The PV of adjusted premiums at the time of change is equal to:

      (a) PV(Future Guaranteed Benefits) + (Additional Expense Allowance) – (Current cash surrender value)

    (4) Additional Expense Allowance =

      (a) 0.01 * (Avg Face$_{NEW}$ – Avg Face$_{OLD}$) + 1.25 * Increase in NLP

      (b) Calculate the average face over the next 10 policy years

$$NLP^{NEW} = \frac{NLP^{OLD} \times \ddot{a}_{x+t} + PV(\text{Increase In Future Benefits})}{\ddot{a}_{x+t}}$$

THESE PRESENT VALUES ARE AS OF THE PREMIUM/BENEFIT CHANGE

  iv) Mortality tables and interest rates used in calculation

    (1) Mortality – 80 CSO, 80 CSO with select factors, or 1961 standard industrial table

    (2) Interest – 125% of the stat valuation rate rounded to the nearest 0.25%

    (3) Use the same non-forfeiture assumptions for all policies issued in the same calendar year

    (4) Exceptions:

      (a) May use last year's non-forfeiture interest rate

      (b) When calculating the cash surrender value of a paid up non-forfeiture benefit, use the same assumptions as when calculating the non-forfeiture benefit

      (c) When calculating the PV of any paid up term insurance, use the Commissioners 1980 Extended Term Insurance table or the Commissioners 1961 Industrial Extended Term insurance table

      (d) May modify assumptions for substandard policies

      (e) May substitute any table that has been adopted by the NAIC

5) Non-forfeiture benefits for indeterminate premium plans

  a) Guidance for indeterminate premium policies

    i) The commissioner must be satisfied that benefits & non-forfeiture values provided are consistent with minimum benefits required by SNL

    ii) The commissioner must be satisfied that the policyholder is not misled by the pattern of premiums and benefits

    iii) Any indeterminate premium plan must be approved by the commissioner before it can be marketed or sold

Keep in mind that an indeterminate premium product is not a flexible premium product. It will be similar to a traditional product BUT it will have a current and guaranteed premium.

6) Proration of values; Net value or paid-up additions
   a) Proration
      i) So far SNL has described the cash surrender value and non-forfeiture benefits on policy anniversary
      ii) If the policy has lapsed between anniversaries, the surrender values must be prorated
   b) Disregard the following benefits when calculating minimum non-forfeiture benefits:
      i) Accidental death and dismemberment benefits
      ii) Disability benefits
      iii) Reversionary annuity benefits
      iv) Term riders which would not be subject to this regulation if issued separately
      v) Child term riders – Small amount for a child until they turn reach a specified age
      vi) Any other benefits besides death and endowment benefits

7) Consistency in the progression of cash surrender values with increasing policy duration
   a) Any cash surrender value must not differ by more than 0.2% of the face amount from:
      i) Max(0, Basic cash value) + PV(Any paid-up additions) – (indebtedness)
   b) Basic cash value is equal to:
      i) PV(Future guaranteed benefits) – PV(Future non-forfeiture factors)
   c) Non-forfeiture factor is a percentage of the adjusted premiums:
      i) The percentage is the same between the second policy year and the later of:
         (1) The 5th policy anniversary
         (2) The first anniversary where there is a cash surrender value is > 0.2% of the face
      ii) After that, each percentage must apply to at least 5 consecutive policy years

8) Exceptions
   a) SNL for life insurance does not apply to:
      i) Reinsurance
      ii) Group Insurance
      iii) Pure Endowments
      iv) Annuities
      v) Level premium term policies where duration is 20 years or less AND benefits expire before age 71
      vi) Decreasing term policies where the adjusted premium is less than the corresponding level term policy AND duration is 20 years or less AND benefits expire before age 71
      vii) Policies where minimum non-forfeiture values are ≤ 2.5% of the face amount in all years

9) Effective date
   a) January 1, 1948
   b) *Yes, this has been on the syllabus for a long time!*

Review Question

You are given the following information:

Product:	Level lifetime premium non-par whole life
Premiums:	6,000 per year for life
Death Benefit:	500,000

Age	$\ddot{a}_x$	A_x
35	20.800	0.19998
36	20.611	0.20725
37	20.416	0.21477
38	20.214	0.22253
39	20.007	0.23052
40	19.793	0.23874
41	19.573	0.24720
42	19.346	0.25591
43	19.113	0.26488
44	18.874	0.27409
45	18.628	0.28355
46	18.376	0.29325
47	18.117	0.30320
48	17.851	0.31344
49	17.576	0.32400
50	17.293	0.33490

(a) Calculate the minimum cash surrender value for a policy issued at age 37 and currently at age 42.

(b) Calculate the minimum cash surrender value for a policy issued at age 37 and currently at age 47.

(c) Calculate the minimum cash surrender value for a policy issued at age 45 and currently at age 50.

(d) Assume that the policy is a single pay whole life with issue age 35. What is the minimum cash surrender value at age 45?

Solution

(a) Calculate the minimum cash surrender value for a policy issued at age 37 and currently at age 42

Net level premium = 500,000 * 0.21477 / 20.416 = 5259.85

PV(Adjusted premiums) = PV(Guaranteed Benefits) + 0.01 * (Face) + 1.25 * Min(0.04 * Face, Net level premium)

$Premium_{ADJ}$ * 20.416 = (500,000 * 0.21477) + (0.01 * 500,000) + 1.25 * Min(0.04 * 500000, 5259.85)

$Premium_{ADJ}$ = 118,959.81 / 20.416 = 5,826.79

Minimum Cash Surrender Value = Minimum Non-forfeiture amount =
PV_5(Guaranteed Benefits) − PV_5(Adjusted Premiums) = 500,000 * A_{42} − 5,826.79 * $ä_{42}$ =
127,955.00 − 112,725.14 = 15,229.86

(b) Calculate the minimum cash surrender value for a policy issued at age 37 and currently at age 47
Same adjusted premium as part (a)

Minimum Cash Surrender Value = Minimum Non-forfeiture amount =
PV_{10}(Guaranteed Benefits) − PV_{10}(Adjusted Premiums) = 500,000 * A_{47} − 5,826.79 * $ä_{47}$ =
151,600.00 − 105,564.01 = 46,035.99

(c) Calculate the minimum cash surrender value for a policy issued at age 45 and currently at age 50
Net level premium = 500,000 * 0.28355 / 18.628 = 7610.85

PV(Adjusted premiums) = PV(Guaranteed Benefits) + 0.01 * (Face) + 1.25 * Min(0.04 * Face, Net level premium)

$Premium_{ADJ}$ * 18.628 = (500,000 * 0.28355) + (0.01 * 500,000) + 1.25 * Min(0.04 * 500000, 7610.85)

$Premium_{ADJ}$ = 156,288.56 / 18.628 = 8,389.98

Minimum Cash Surrender Value = Minimum Non-forfeiture amount =
PV_5(Guaranteed Benefits) − PV_5(Adjusted Premiums) = 500,000 * A_{50} − 8,389.98 * $ä_{50}$ =
167,450.00 − 145,087.94 = 22,362.06

(d) Assume that the policy is a single pay whole life with issue age 35. What is the minimum cash surrender value at age 45?

No future premiums at age 45 so the minimum non-forfeiture amount is equal to the PV(Guaranteed Benefits)

PV_{10}(Guaranteed Benefits) = 500,000 * A_{50} = 500,000 * 0.28355 = 141,775.00

LP Formula List

Writing down the formulas on exam day is a key aspect of getting the maximum amount of points. This formula list is a compilation of some of the important formulas on the syllabus. This list is meant to help facilitate memorization and should not be considered to include every formula in the LP syllabus. Please add or delete formulas as appropriate per your personalized study strategy.

Section A: Product Design and Product Features

Life and Annuity Products and Features (LP-105-07)

Chapter 1: Term Insurance

PV at age x of extra mortality cost due to conversion at year r
$$A_{x,m,r} = {}_t p_{x,m} \times e_{x,m,r} \times K_{x,m,r} \times v^r$$

PV at age y of extra mortality cost where $y = x + r$

$$K_{x,m,r} = \sum_{t=1}^{\infty} {}_{t-1}p_{y,m,r} \times \left[q_{(y,m,r)+t-1} - q_{[y]+t-1} \right] \times NAR_{y+t} \times v^t$$

Determination of Cost of Options (equal to the sum of the below expressions)

$$CR_{x,t} + \frac{Option\ Handling\ Expense}{Average\ Size\ of\ Policies\ in\ Radix} \times \frac{Options_{x,t-j,i}}{Radix}$$

$$\sum_i \sum_{j=1}^{t-1} \frac{Options_{x,j,i}}{Radix} \times FAPCT_{x,j,i} \times Option\ Charge_{x,t-j,i}$$

Chapter 3: Variable Life Insurance

Fixed Premium Variable NYL Design
$$DB = Face_0 * (CV^{actual} / CV^{tabular})$$

Fixed Premium Variable Equitable Design
$$DB = Face_0 + (Excess\ of\ investment\ performance\ over\ AIR)/A_{x+t}$$

Chapter 5: Extra Premiums For Substandard Life Insurance Risks

Gross Extra Premium Calculations
$$GEP = Substandard\ total\ gross\ premium - standard\ gross\ premium$$

$$GP_R = NP_R(1+c)\frac{I_R}{\ddot{a}_{x:n}^R} + K_R + Z_R GP_R$$

$$GP = NP(1+c)\frac{I}{\ddot{a}_{x:n}} + K + Z\ GP$$