

Exam ILALP

AFTERNOON SESSION

Date: Wednesday, October 31, 2018

Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 4 questions numbered 7 through 10 for a total of 40 points. The points for each question are indicated at the beginning of the question.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate afternoon session for Exam ILALP.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

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Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****

Afternoon Session
Beginning with Question 7

7. (9 points) Utopia Republic (UR) is a remote island nation with its own distinct mortality pattern and policyholder behavior.

- (a) (5 points) You are given the following observations of UR's life insurance industry experience non-validated data from the last 5 years:
- Actual number of claims from 3 years ago were 20% more than the average number of claims from the other 4 years. The number of claims from the 4 non-outlier years range from 981 to 1024.
 - Mortality rates calculated from experience data for attained ages 27-33 are level except for a jump at age 31.
 - Preferred underwriting claims increased in the last two years. According to the submission notes, several companies had administrative system upgrades two years ago. One company submitted preferred underwriting claims data for the first time.
 - Experience data from the smallest company contains male records only while other companies are 60% female.

IJK Life operates in the UR and is given the following guidelines to develop their mortality assumptions:

- A. *Use relevant and credible industry experience data because IJK Life has no credible experience.*
- B. *Do not research the increased claims from 3 years ago because it could be due to random fluctuation.*
- C. *Review the findings from previous studies for possible explanations of a spike in experience for attained age 31.*
- D. *Include data from preferred underwriting except for the data from the company that showed preferred underwriting claims for the first time.*
- E. *Duplicate a copy of experience data from the smallest company and code them as female so female mortality rates won't be too low.*

Critique each guideline and recommend an appropriate action if necessary. Justify your answer.

7. Continued

- (b) (4 points) IJK Life is developing a pet insurance rider to pay a benefit upon the death of the pet insured. The rider can only be added to the policy during the pet's first year of life. There are two breeds of pets in UR and the owner does not know the breed of the animal at the time of birth.

Assume:

- 35% of new born pets are breed A and 65% are breed B.
- Discount rate is 5%.
- Death benefit is payable at the end of the policy year.
- Mortality rate for each breed is:

	Year 1	Year 2	Year 3	Year 4	Year 5
Breed A	0.050	0.020	0.130	0.700	1.000
Breed B	0.025	0.500	0.313	0.200	1.000

Calculate the mortality cost at issue for 1,000 of pet insurance using an appropriate blending method. Show all work.

8. (12 points) JCK Life is developing term life insurance and deferred annuity products. You are given:

Asset Default Factors	JCK Life	Regulatory	Rating Agency
Treasury	0.000	0.001	0.000
Corporate bonds rated A or better	0.006	0.012	0.003
Corporate bonds rated BBB	0.010	0.020	0.015
Corporate bonds rated below BBB	0.030	0.100	0.040
Commercial mortgage	0.050	0.120	0.150

Asset Portfolio for New Products	Amount
Treasury	100
AA-rated corporate bonds	255
BB-rated corporate bonds	45
Commercial mortgages	100

- (a) (2 points) Calculate the asset default risk for JCK Life's new product portfolio from each of the following perspectives:

- JCK Life
- Regulatory
- Rating agency

Show all work.

- (b) (2 points) You are given:

- JCK's competitors use the regulatory asset default factors in their pricing
- JCK uses rating agency factors for new products

Explain how JCK's choice of asset default factors affects their new products.

- (c) (3 points) With regard to the liquidity and disintermediation risks of JCK's new product portfolio:

- (i) Explain how these risks could affect JCK in a rising interest rate environment.
- (ii) Describe ways to mitigate these risks.

8. Continued

(d) (4 points) You are given:

Time	Premium	Benefit Expenses	Solvency Reserve	Earnings Reserve	DAC Amortization	Pre-tax Solvency Earnings	Required Capital
1	350	201	335	(95)	25	(330)	224
2	339	195	358	(53)	25	118	208
3	325	188	350	(15)	24	143	192
4	306	182	339	12	24	133	176

- Maintenance expenses are 5% of premium in all years
- Assets backing reserves earn 4%
- Assets backing surplus earn 7%
- Tax rate is 35%

Calculate:

- (i) Distributable earnings in year 3
- (ii) Return on equity in year 3 using stockholder equity at the beginning of year as equity base

Show all work.

- (e) (1 point) Explain the advantages to JCK of using solvency earnings in their pricing.

9. (9 points) ABC Life offers a U.S. participating level-pay whole life insurance product.

(a) (3 points) Critique the following statements with respect to IRC section 7702:

- (i) *If a contract fails to meet the test conditions on any future date, the contract fails the test.*
- (ii) *Once a testing method is selected, it can be switched to a different test to maintain compliance.*
- (iii) *Cash surrender value used for testing is different from the general understanding of cash surrender value.*
- (iv) *There are no adjustments for applying dividends used to purchase a paid-up-addition.*

You are given:

- Level death benefit is 250,000
- Gross annual premium is 4,500
- The gross premium is calculated based on the 2001 CSO table (the prevailing mortality table) and reasonable expense charges, and a 6.25% interest

Statutory Valuation Rate by Issue Year	
2017	5.00%
2018	4.00%

Age	Discount Rate					
	4.00%		5.00%		6.25%	
	\ddot{a}_x	A_x	\ddot{a}_x	A_x	\ddot{a}_x	A_x
45	18.52	0.350	18.25	0.320	17.65	0.280
46	18.20	0.362	17.93	0.332	17.33	0.292
47	17.88	0.374	17.61	0.344	17.01	0.304
48	17.56	0.386	17.29	0.356	16.69	0.316
49	17.24	0.398	16.97	0.368	16.37	0.328
50	16.92	0.410	16.65	0.380	16.05	0.340

(b) (3 points) Calculate the minimum cash surrender value for a 48 year old, issued at age 45 in year 2018 under NAIC Standard Nonforfeiture Law. Show all work.

9. Continued

- (c) (3 points) Management recommends calculating the guaranteed cash value of the product using an interest rate of 2% and applying the formula for the Standard Nonforfeiture Law.

Recommend a choice of 7702 compliance tests for this revision. Justify your answer.

10. (10 points) RHK Life is considering selling single premium CD annuities with the following:

- Initial interest rate guarantee period is 5 years and is renewed every 5 years thereafter
- Surrender charges are a percent of account value

Policy year	1	2	3	4	5
Surrender charge	9%	8%	7%	6%	5%

- Surrender charges reset every five years and are waived for 30 days at the end of each 5-year period
- Commission is 10% of premium at issue with no renewal commissions
- Bailout provision if the 5-year Treasury rate ever exceeds the current credited rate

- (a) (2 points) Describe how each of the above product features affects the surrender rates.
- (b) (1 point) Critique the proposed commission schedule.
- (c) (3 points) Contrast pricing considerations for bailout provisions against Market Value Adjustment (MVA) features for the above product.
- (d) (4 points) Critique the following statement:

"To quantify the interest rate risk, the model was run over 10,000 interest rate scenarios. The interest rate scenarios were built based on Treasury rate history from the last fifty years. RHK's lapse experience for CD annuities since 2010 was also used as inputs to the model. The analysis found little interest rate risk from this product. This is primarily because RHK has outperformed the market with its alternative one-year fixed income instruments, eliminating disintermediation risk."

****END OF EXAMINATION****
Afternoon Session

USE THIS PAGE FOR YOUR SCRATCH WORK

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