

# EDUCATION COMMITTEE OF THE SOCIETY OF ACTUARIES (SOA)

## INTRODUCTORY STUDY NOTE

**EXAM SESSION:** FALL 2017

**EXAM:** INDIVIDUAL LIFE AND ANNUITIES—LIFE PRICING

**DATE & TIME:** Wednesday, November 1, 2017; 8:30 a.m. – 11:45 a.m. and 1:30 p.m. – 3:45 p.m.

1. The examination will consist of five hours of written answer questions. A read-through time will be given prior to the start of the exam, 15 minutes in the morning session and 15 minutes in the afternoon session. No writing is allowed during the read-through time.
2. The following link shows a recommended FSA module/exam sequence for each track:  
<http://www.soa.org/Education/Exam-Req/edu-new-fsa-recommended.aspx>  
  
This order is NOT mandated. Each candidate will determine the appropriate sequence based on factors including readiness to sit for an exam, exam administration schedules, or study time available. However, the Education committees believe that these recommendations provide the most effective guide for candidate success. An examination/module may assume familiarity with material that is covered in any requirement that is recommended to come before that examination or module.
3. The Syllabus material includes textbooks, online readings, and the study notes listed in the Appendix. The Appendix also may contain additional important information regarding this exam. A complete listing of the Syllabus and Learning Objectives is located in this exam's home page on the SOA Web site. Study notes listed with an asterisk (\*) will also be included in the Revision set of study notes.
4. Several book distributors carry some or all of the textbooks for the Society of Actuaries exams. A list appears on the SOA Web site: <http://www.soa.org/education/exam-req/resources/edu-txt-manuals.aspx>.
5. Any changes in the Syllabus for this exam will be published under "Updates" in this exam's home page on the SOA Web site.
6. Past exams, solutions and case studies are available at: <http://www.soa.org/education/exam-req/syllabus-study-materials/edu-multiple-choice-exam.aspx>
7. A case study will not be used for this examination.
8. The candidate should be very familiar with the Learning Objectives. These Learning Objectives are the first ingredient in developing the syllabus and also guide the examination committee when writing questions. The Learning Objectives set out the cognitive level needed to pass this exam. You will notice that the candidates are expected to "analyze," "explain," "calculate," "describe," "apply," etc. While studying the syllabus material, candidates may want to refer back to the Learning Objectives to remain focused on the goals of the exam.

9. The examination questions for this exam will be based on the required readings for this exam. If a conflict exists (in definitions, terminology, etc.) between the readings for this exam and the readings for other exams, the questions should be answered on the basis of the readings for this exam.
10. Candidates may ONLY use these battery or solar-powered Texas Instruments models: BA-35, BA II Plus\*, BAII Plus Professional\*, TI-30Xa, TI-30X II\* (IIS solar or IIB battery), and TI-30X MultiView\* (XS solar or XB battery). Candidates may use more than one of the approved calculators during the examination.

Calculator instructions may not be brought into the exam room. During the exam, the calculator must be removed from its carrying case so the supervisor can confirm that it is an approved model. Candidates using a calculator other than the approved models will have their exams disqualified.

Candidates can purchase calculators directly from: Texas Instruments, Attn: Order Entry, PO Box 650311, Mail Station 3962, Dallas, TX 75265, phone 800/842-2737 or <http://epsstore.ti.com>.

*\*The memory of the **BA II Plus**, **BA II Plus Professional**, **TI-30X II** and **TI-30X MultiView** calculators will need to be cleared by the examination supervisor upon the candidate's entrance to the examination room.*

11. A list of various seminars/workshops and study manuals appears on the SOA Web site <http://www.soa.org/education/exam-reg/resources/edu-sem-workshops.aspx> and <http://www.soa.org/education/exam-reg/resources/edu-txt-manuals.aspx>. These seminars/workshops and study manuals do not reflect any official interpretation, opinion, or endorsement of the Society of Actuaries or its Education Committee.

Please note that the Education Committee expects candidates to read the material cited in the *Syllabus* and to use other material as a complement to the primary sources rather than a substitution for them.

12. The Society of Actuaries provides study notes to persons preparing for this examination. They are intended to acquaint candidates with some of the theoretical and practical considerations involved in the various subjects. While varying opinions are presented where appropriate, limits on the length of the material and other considerations sometimes prevent the inclusion of all possible opinions. These study notes do not, however, represent any official opinion, interpretation or endorsement of the Society of Actuaries. The Society is grateful to the authors for their contributions in preparing study notes.

The American Academy of Actuaries, the Canadian Institute of Actuaries, the Conference of Consulting Actuaries, and the Society of Actuaries jointly sponsor various examinations administered by the Society of Actuaries.

## APPENDIX

Study notes for this exam

Code	Title
LP-102-07	Equity Indexed Annuities: Product Design and Pricing Considerations
LP-105-07	Life and Annuity Products and Features
LP-107-07	Experience Assumptions for Individual Life Insurance and Annuities
LP-110-07	Policyholder Dividends
LP-113-09	The Economics of Insurance—How Insurers Create Value for Shareholders
LP-114-09	Life Insurance Costing and Risk Analysis
LP-116-10	Variable Annuities Chapters 5 and 9–11
LP-121-13	Life Insurance and Annuity Nonforfeiture Practices
LP-122-13	NAIC Standard Nonforfeiture Law for Life Insurance
LP-123-13	NAIC Standard Nonforfeiture Law for Individual Deferred Annuities
LP-124-13	The Role of the Actuary in Product Roll-out
LP-125-13	NAIC Life Insurance Illustrations Model Regulation
LP-126-13	Pricing Critical Illness Insurance in Canada
LP-127-13	Product Design of Critical Illness Insurance in Canada
LP-128-13	Guideline G6—Illustrations
LP-130-14	Life Insurance Underwriting in the United States—Yesterday, Today and Tomorrow
LP-131-15	Deconstructing Long-Term Care Insurance
LP-132-15	Lapse-Based Insurance
LP-133-16	Testing for Adverse Selection in Life Settlements: The Secondary Market for Life Insurance Policies
LP-134-15	Digital Distribution in Insurance: A Quite Revolution
LP-135-15	Update on the Interstate Insurance Compact
LP-136-15	Chapter 4, pp.12-31 of <i>Marketing for Actuaries: Individual Life and Health Insurance</i>
LP-138-16	2015 Global Insurance Market Report (GIMAR)
LP-139-16	The Connection Between Military & Business Strategies: A Brief History of Business Strategy

Code	Title
LP-140-16	Life Insurance Product Development Innovation and Optimization
LP-141-16	Introduction to Reinsurance
LP-142-16	Malcolm Life Enhances Its Variable Annuities
LP-143-16	Breaking the Ice: Using Transparency to Thaw the Securitization Market
LP-144-16	Capital, Cash, Shareholder Value and Active In-Force Management
LP-145-16	Actuarial Guideline 49: A Closer Look
LP-146-16	Actuarial Guideline 49: Post Standards Update
LP-147-17*	Life Insurance: Focusing on the Consumer

The following additional information applies to this exam:

1. Errata:

*Stochastic Modeling: Theory and Reality from an Actuarial Perspective:*

Page II-19, formula II-A-23. The Greek sigma with superscript S and subscript i-1 should be squared.

[Investment Guarantees—Modeling and Risk Management for Equity-Linked Life Insurance, Hardy.](#)

[Life Insurance Products and Finance](#), Atkinson, Dallas 2000

Correction to LP-139-16: Page 34, replace the 3 bullets under “Game Theory” with:

- *If they both cooperate (with each other), then both will be convicted of a minor offense and sentenced to one year in jail*
- *If both defect, then both will be sentenced to jail for five years*
- *If one cooperates (with the other) and the other defects, the defector will be released immediately but the other will be sentenced to 10 years in jail*

Correction to LP-141-16:

The examples on Page 12 contains an incorrect analysis for Example 2. For stop-loss reinsurance, the priority (deductible) is first exhausted and then the copayment applies to the excess. The example has a priority of 80% of the premium, a capacity (maximum to be paid by the reinsurer) of 20%, and a copayment of 25%. Example 1 – claims are 70%. The priority reduces the reinsurer's obligation to 0. The insured pays the full claim. Example 2 – claims are 100%. The priority reduces the reinsurer's obligation to 20%. The copayment reduces it to  $0.75(20\%) = 15\%$ . This is below the capacity, so the reinsurer's share is 15% and the insured pays 85%. (It appears the author used 20% as the copayment) Example 3 – claims are 115%. The priority reduces the reinsurer's obligation to 35%. The

copayment reduces it to  $0.75(35\%) = 26.25\%$ . This is above the capacity, so the reinsurer's share is 20% and the insured pays 95%. (Adding the amounts allocated to the cedant by the author,  $80 + 6.67 + 8.33$ , produces the same result).