

# **CASUALTY ACTUARIAL SOCIETY**

ORGANIZED 1914

## **RECOMMENDATIONS FOR STUDY**

(1974 Syllabus)

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**RULES REGARDING EXAMINATIONS FOR ADMISSION  
SYLLABUS OF EXAMINATIONS  
RECOMMENDATIONS FOR STUDY**

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OFFICE OF THE SOCIETY

200 East 42nd Street • New York, New York 10017

*Nineteenth Edition, 1974*

PROCEEDINGS AND OTHER PUBLICATIONS  
OF THE SOCIETY

The Prices of back numbers of the Proceedings and other publications of the Society and a list of those back numbers still in print are set out in the Year Book of the Society.

Those wishing to purchase these publications should write to:

Secretary-Treasurer  
Casualty Actuarial Society  
200 East 42nd Street  
New York, New York 10017

## RULES REGARDING EXAMINATIONS FOR ADMISSION

(Effective with May 1974 Examinations)

## 1. Dates of Examinations

Examinations for Parts 1 and 2 will be held twice yearly, in May and November. The examinations for Parts 4, 6 and 8 will be offered annually in November. The examinations for Parts 3, 5, 7, and 9 will be offered annually in May.

The Secretary-Treasurer will announce the exact dates on which the examinations will be given. It is customary to hold the examinations in such cities as will be convenient.

## 2. Filing of Application

A candidate who wishes to take Part 1 or Part 2, or both, must make application on the Society's application form, which may be obtained from the Secretary-Treasurer.

A candidate who has previously submitted his application on the Society's application form, and who wishes to take one or more examinations other than Parts 1 and 2, need not again make use of the Society's application form, but may simply write to the Secretary-Treasurer, stating the part or parts for which he is applying.

Each application must be accompanied by the appropriate examination fee, in check, draft, or money order payable to the Casualty Actuarial Society.

Applications must be received by the Secretary-Treasurer by April 1 for the Spring examinations and by October 1 for the Fall examinations.

## 3. Associateship and Fellowship Examinations

There are five examinations which the candidate must pass in order to become an Associate of the Casualty Actuarial Society. Part 1, the General Mathematics examination, and Part 2, the Probability and Statistics examination, are jointly sponsored by the Casualty Actuarial Society and the Society of Actuaries. Successful candidates will be given credit for these examinations by both Societies regardless of the Society through which the candidate registers.

There are four examinations which a candidate must also pass to become a Fellow of the Casualty Actuarial Society.

## 4. Fees

The examination fee schedule at time of publication is as follows:

Parts 1, 2	\$10.00 for each Part
Part 3	\$10.00
Parts 4-9	\$20.00 for each Part

Examination fees are payable each time the candidate presents himself. Check, draft, or money order payable to the order of the Casualty Actuarial Society must be received by the Secretary-Treasurer before April 1 for the Spring examinations, or before October 1 for the Fall examinations.

## 5. Prize Awards

The Casualty Actuarial Society and the Society of Actuaries will jointly award one \$200 and four \$100 prizes to the five successful undergraduates ranking highest in the General Mathematics examination. These prize awards will be granted for both the Spring and Fall examinations.

## 6. Waiver of Examinations for Associateship

Waiver of certain Associateship examinations will be allowed for a candidate who has passed or been credited with corresponding examinations of the Society of Actuaries, in accordance with the following:

<u>Casualty Actuarial Society</u>	<u>Society of Actuaries</u>
Part 1	Part 1, General Mathematics, passed prior to 1963 (before joint sponsorship)
Part 2	Part 2, Probability and Statistics, passed prior to 1966 (before joint sponsorship)
Part 3	Part 4, Life Contingencies, passed prior to 1969
Part 3	Parts 3 and 4 both, if Part 4 is passed after 1968

Candidates who take the Advanced Mathematics Test of the Graduate Record Examinations may apply for credit for Part 1. Credit will be granted if the candidate's score on the Graduate Record Advanced Mathematics Test is equivalent, as determined by the Casualty Actuarial Society, to a passing score on Part 1.

An application to the Casualty Actuarial Society for credit may be submitted either in advance of taking the Graduate Record Advanced Mathematics Test or after taking it. Acceptance of applications submitted more than three years after the test has been taken will be at the discretion of the Education and Examination Committee.

The required application form can be obtained from the Secretary-Treasurer of the Casualty Actuarial Society. A small fee will be required in most instances in connection with securing a transcript of the candidate's scores on the test; the fees are explained on the application form.

The Board of Directors may waive, subject to such other requirements as it may prescribe, any examination of the Casualty Actuarial Society if the applicant has passed any examination required by another recognized professional organization that the Board of Directors deems equivalent to such examination of the Casualty Actuarial Society.

#### LIBRARY

All candidates registered for the examinations of the Casualty Actuarial Society and all members of the Casualty Actuarial Society have access to all the library facilities of the Insurance Society of New York, the Casualty Actuarial Society, and the Society of Actuaries. These libraries, with combined operations, are located at 150 William Street, New York, New York 10038.

Registered candidates may have access to the Library by receiving from the Society's Secretary-Treasurer the necessary credentials. Books and manuals may be withdrawn from the library for a period of one month without charge. In general, not more than two references may be in the hands of a borrower at one time. The Insurance Society is responsible for postage and insurance charges for sending books to out-of-town borrowers, and borrowers are responsible for the safe return of the books.

Address requests for books to:

Mr. Arthur R. Cadorine  
CAS Library Service  
c/o Insurance Services Office  
160 Water Street  
New York, N.Y. 10038

#### AMERICAN ACADEMY OF ACTUARIES

Satisfactory completion of examinations 1 through 7 of the Casualty Actuarial Society will satisfy the educational requirements of the American Academy of Actuaries. For further information contact the Academy at 208 South LaSalle Street, Chicago, Illinois, 60604.

SYLLABUS OF EXAMINATIONS  
(Effective with 1969 Examinations)

ASSOCIATESHIP

Part	Time Allowed	Subject
1	3 hours	General Mathematics (jointly sponsored with the Society of Actuaries)
2	3 hours	Probability and Statistics (jointly sponsored with the Society of Actuaries)
3	2 hours	Compound Interest and Life Contingencies
4	3 hours	(a) Principles of Economics: Theory of Risk and Insurance (b) Insurance Coverages and Policy Forms
5	3 hours	(a) Principles of Ratemaking (b) Insurance Statistics and Data Processing

FELLOWSHIP

6	3 hours	(a) Insurance Law; Supervision, Regulation, and Taxation (b) Statutory Insurances
7	3 hours	(a) Insurance Accounting and Expense Analysis (b) Premium, Loss, and Expense Reserves
8	2 hours	Individual Risk Rating
9	3 hours	Advanced Insurance Problems

## RECOMMENDATIONS FOR STUDY

The examinations for admission to the two grades of membership in the Society are designed to establish the qualifications of candidates. The following Recommendations For Study are provided as a guide for the candidates in their preparation for the examinations. It should be realized that although the examination questions will be based upon the textual material cited, they will not necessarily be drawn directly therefrom. The examinations will test not only the candidate's knowledge of the subject matter, but also his ability to apply that knowledge.

In their study for the mathematical sections of the Associateship Examinations, candidates are advised to work out as many examples as possible, in order to acquire facility in the application of the mathematical principles and methods to specific problems. The questions on the examinations for Parts 1 and 2 are all of the multiple choice type.

In preparing for each part of the Fellowship Examinations, the candidate should become familiar with current developments by reading regularly at least two general insurance periodicals.

The references to papers in the Proceedings of the Casualty Actuarial Society (denoted by P.C.A.S.) are considered to include all discussions of these papers in these publications, though the page references cited refer to the papers only.

A description of the texts cited will be found in the Index To Readings at the end of these Recommendations. The reading material suggested in these Recommendations is designed to acquaint the student with the respective subjects and should not be interpreted as representing views endorsed by the Casualty Actuarial Society.

Study notes have been prepared to assist the student in connection with the Associateship Part 3 and Fellowship Part 8 examinations. Each study note can be obtained from the Secretary-Treasurer's office at a cost of \$1.00 per copy. From time to time additional study notes will become available and the student should make inquiry of the Secretary-Treasurer of the Society. Also available without charge is a note entitled "Hints on Study and Exam Techniques".

Readings for Fellowship Part 6 and Part 8 from out-of-print Proceedings of the Casualty Actuarial Society are available from the Society's office.

Part 6	\$1.50
Part 8	\$3.00

Copies of examinations for recent years and sample examination questions may be obtained from the Secretary-Treasurer.

## PART 1

## GENERAL MATHEMATICS

(Jointly sponsored by the Casualty Actuarial Society and the Society of Actuaries.)

This three-hour multiple-choice examination is based on material usually covered in undergraduate mathematics courses through the differential and integral calculus. The following list of topics will serve to indicate the general scope of the examination:

Real and complex numbers; binomial theorem; elementary set theory including unions, intersections, and complements; functions; equations and inequalities; analytic geometry of two and three dimensions; systems of linear equations; determinants and elementary matrix algebra; standard algebraic and transcendental functions including polynomial, rational, trigonometric, logarithmic and exponential functions; limits, continuity, differentiability and integrability; derivatives, integrals and partial derivatives; the fundamental theorem of integral calculus; applications of derivatives and integrals, including multiple integrals; finite and infinite sequences and series, including the Taylor series expansion; mean value theorem.

The subject matter on which this examination is based is covered by textbooks used in standard mathematics courses. For students who have not had such courses a list of representative textbooks is to be found on page 27 of this syllabus.

## PART 2

## PROBABILITY AND STATISTICS

(Jointly sponsored by the Casualty Actuarial Society and the Society of Actuaries.)

This three-hour multiple-choice examination is based on material usually covered in undergraduate courses in mathematical probability and statistics. It can be taken by college students who have had a thorough course in these subjects or by persons who have done concentrated reading in these fields. The general scope of the examination is indicated by the following topics, which are among those proposed for a one-year college course in probability and statistics by the Committee on the Undergraduate Program in Mathematics (CUPM) of the Mathematical Association of America:

Sample spaces; axioms and elementary theorems of probability; independence, conditional probability, and Bayes' theorem; permutations and combinations; random variables; binomial, Poisson, normal, and other probability distributions; expectation, mean, variance, and moment-generating functions of probability distributions; multivariate distributions; transformations of random variables; conditional and marginal distributions; Chebyshev's inequality, law of large numbers, central limit theorem; point estimation, including maximum likelihood estimation and the application of criteria such as consistency, unbiasedness, and minimum variance; tests of statistical hypotheses, including power functions, Type I and Type II errors, Neyman-Pearson lemma,

and likelihood ratio tests; applications of sampling distributions, such as the normal, chi-square, F, and Student's t distributions, to confidence intervals and to tests for means and variances; regression and correlation; random sampling and randomization techniques; interpretation of experimental results.

The CUPM has reported that statistics courses can be implemented in a variety of ways, including different topics and placing different emphases on topics. That widely divergent approaches are acceptable is illustrated by the many texts appropriate for a one-year college course. Among such texts, those listed on page 27 of this syllabus are representative of those which cover the above topics and which provide the mathematical background required for this examination.

Students who have mastered the text material and can work the problems in any one of these references, and who have also had adequate practice in solving problems, should be adequately prepared to handle the mathematical material in this examination.

An additional reference, for students who may wish to acquire further insight into the underlying nature of statistics and exposure to statistical applications, is Statistics: A Guide to the Unknown, by Tanur, Mosteller, et al. (Holden-Day), available in both hard cover and paperback form.

It will be assumed that the student is familiar with the ordinary deck of fifty-two playing cards and the ordinary six-faced die.

### PART 3\*

#### COMPOUND INTEREST AND LIFE CONTINGENCIES

Kellison, S.G. The Theory of Interest. 1970. (Omit Section 7 of Chapter 4, Sections 9 and 10 of Chapter 6, and Sections 3, 4 and 5 of Chapter 7.)

Menge, W.O. and Fischer, C.H. The Mathematics of Life Insurance. (Either the 1965 publication by the Macmillan Company or the 1970 publication by Ulrich's Books, Inc. may be used.)

Study Note on Multiple Life Functions. (The Study Note may be obtained from the Casualty Actuarial Society's Secretary-Treasurer at a cost of \$1.00 per copy.)

Ferguson, R.E. "Actuarial Note on Workmen's Compensation Loss Reserves." P.C.A.S. LVIII, 1971.

New York (State) Workmen's Compensation Board, "Workmen's Compensation Tables" (3% interest). 1948. (Special Bulletin No. 222).

(The candidate should have a working knowledge of the tables in the bulletin but will not be required to develop or reproduce the formulas contained in the Appendix.)

\*Also see "Recommendations for Study", page 5.

## PART 4

## (a) PRINCIPLES OF ECONOMICS: THEORY OF RISK AND INSURANCE

In studying the following references it is recommended that they be read in the order listed:

- Samuelson, P.A. Economics: An Introductory Analysis. 1970.  
Chapters 1-5, 10-15, 18-20, 21 (Appendix only), 22-26, 30, 31, 33,  
or  
Samuelson, P.A. Economics 1973. Chapters 1-4, 6, 10-15, 18-20,  
21 (Appendix only), 22-26, 30, 31, 33.
- Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapters 1 and 18.
- Bickelhaupt, D.L. and Magee, J.H. General Insurance. 1970.  
Chapters 1-3.
- Raiffa, H. "Decision Analysis - Introductory Lectures on Choices Under Uncertainty."
- Willett, A.H. Economic Theory of Risk and Insurance. 1951
- Houston, D.B. "Risk, Insurance, and Sampling." The Journal of Risk and Insurance. Vol. XXXI, No. 4. p. 511.

## (b) INSURANCE COVERAGES AND POLICY FORMS

The candidate should be familiar with the policy provisions and the bases of exposure used in the respective lines of insurance.

The principal current manuals should be studied. The names of the organizations publishing these manuals are cited herein; where separate manuals are published for individual states, the manual for a typical state should be used.

Policy provisions change from time to time, so that it is essential to supplement the cited texts by study of the contracts currently in use. Copies of current insurance contracts may be obtained from a carrier or reference may be made to the book or kit of sample policies for property and liability coverages cited herein.

Certain of the references encompass some material beyond the scope of this section, such as the determination of manual or class rates and individual risk rating plans. The examination for this section will not reflect such extraneous material.

- Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapters 2-10 and 14-16.
- Bickelhaupt, D.L. and Magee, J.H. General Insurance. 1970. Chapters 4, 10-13, 20, 21, 27, 28 and Appendices C and D.
- Eilers, R.D. and Crowe, R.M., Eds. Group Insurance Handbook. 1965. Chapters 3, 5, 6, 25 and 39.

Head, G.L. Insurance to Value. 1971. Chapters 3, 4, 5 and 9.

American Mutual Insurance Alliance.  
Study Kit of Policies, Forms and Endorsements -- Casualty, Fire, Marine and Life. Current edition.

or

Insurance Information Institute.  
Advanced Book of Sample Insurance Policies for Property and Liability Coverages. Current edition.

Note: A review of The Fire, Casualty and Surety Bulletins, The National Underwriter Company, or Broadened Protection for Personal and Business Risks, current edition, The National Underwriter Company may be helpful to the student in preparing for this section although examination questions will not be derived from these sources. The latter consist of pages from the F.C. & S. Bulletins.

Insurance Services Office.  
Private Passenger Automobile Manual.  
Commercial Automobile Manual.  
Private Passenger Automobile Physical Damage Manual.  
Burglary Insurance Manual.  
Glass Insurance Manual.  
Manual of Boiler and Machinery Insurance.  
Manuals of Liability Insurance.  
Homeowners Policy Manual of Rules and Rates.  
Special Multi-Peril Policy Program Manual.  
Inland Marine Forms - Rules - Rates.

National Council on Compensation Insurance.  
Basic Manual of Rules, Classifications and Rates for Workmen's Compensation and Employers' Liability Insurance.

New England Region - Insurance Services Office.  
Manuals of Rules and Clauses for Fire and Allied Lines.

#### PART 5\*

##### (a) PRINCIPLES OF RATEMAKING

It is recommended that the student study references in the order listed. Reference in the readings listed herein to individual risk rating plans may be ignored.

Michelbacher, G.F. and Roos, N.R. Multiple Line Insurers: Their Nature and Operation. 1970. Chapter 2.

Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapters 11 (pp. 373-375, 386-411 only), 19-21.

Long and Gregg, Property and Liability Insurance Handbook. 1965 Chapters 13, 20 (pp. 285-297 only), 28, 56.

\*Also see "Recommendations for Study", page 5.

- Dorweiler, P. "Notes on Exposures and Premium Bases." P.C.A.S. XVI, 1929. p. 319. or P.C.A.S. LVIII, 1971. p. 59.
- Longley-Cook, L.H. An Introduction to Credibility Theory. 1962.
- Marshall, R.M. Workmen's Compensation Insurance Ratemaking. Revised, 1961.
- Fratello, B. "The Workmen's Compensation Injury Table and Standard Wage Distribution Table - Their Development and Use in Workmen's Compensation Ratemaking." P.C.A.S. XLII, 1955. p. 110.
- Stern, P.K. "Ratemaking Procedures for Automobile Liability Insurance." P.C.A.S. LII, 1965. p. 139.
- Tarbell, L.L. "Automobile Physical Damage Ratemaking." P.C.A.S. XLVI, 1959. p. 123.
- Lange, J.T. "General Liability Insurance Ratemaking." P.C.A.S. LIII, 1966. p. 26.
- Newman, S.H. "Burglary Insurance Ratemaking." P.C.A.S. LIII, 1966. p. 312.
- Brannigan, J.F. "Current Ratemaking Procedures in Boiler and Machinery Insurance." P.C.A.S. LIII, 1966. p. 248.
- Insurance Services Office. Recommended Procedure for Statewide Rate Level Analysis - Fire Insurance. June 1970.
- Insurance Services Office. Recommended Procedure for Distributing Indicated Statewide Rate Level Adjustments by Classification Groupings - Fire Insurance. June 1970.
- Insurance Services Office. Recommended Procedure for Statewide Rate Level Analysis - Extended Coverage Insurance, Commercial Property. December 1972.
- Hartman, G.R. Ratemaking for Homeowners Insurance. 1967. Chapters 10 and 11.
- Cook, C.F. "Trend and Loss Development Factors." P.C.A.S. LVII, 1970. p. 1.
- Head, G.L. Insurance to Value. 1971. Chapters 1, 2, 6-8, and Appendices 1-4.
- Lange, J.T. "The Interpretation of Liability Increased Limits Statistics." P.C.A.S. LVI, 1969. p. 163.

## (b) INSURANCE STATISTICS AND DATA PROCESSING

This section includes reading which covers the planning and use of internal statistical material, the compilation and presentation of insurance statistics for administrative and ratemaking purposes, the sources and uses of external statistics, particularly as they may be required in insurance administration and ratemaking, and general consideration of data processing methods. References are listed in the suggested order for study.

(1) Insurance Statistics

Michelbacher, G.F. and Roos, N.R. Multiple Line Insurers: Their Nature and Operation. 1970. Chapter 11.

Kimball, S.L. and Denenberg, H.S. Eds. Insurance, Government and Social Policy. 1969. Chapter 13.

National Council on Compensation Insurance. Workmen's Compensation Unit Statistical Plan Manual.

Insurance Services Office. Automobile Statistical Plan.

Insurance Services Office. Statistical Plan for Homeowners Policies, Comprehensive Dwelling Policy, Dwelling Policies and Commercial Risks.

Health Insurance Association of America. Statistical Plan for Individual Accident and Health and Individual and Family Hospital, Surgical, Medical Policies. 1958.

The candidate should be familiar with the sources of published insurance statistics in order to know where to obtain such information when the need arises. The following annual publications constitute a representative list of such sources:

Best, Alfred M., Co., Inc.

Best's Insurance Reports (Fire and Casualty).

Best's Reproductions of Principal Schedules from Casualty and Surety Statements.

Best's Fire and Casualty Aggregates and Averages.

Executive Data Service (Summary of).

The National Underwriter.

Argus F.C. & S. Chart.

Argus Chart of Health Insurance.

New York Insurance Department. Loss and Expense Ratios (compiled from Insurance Expense Exhibits).

Weekly Underwriter.

The Insurance Almanac.

(2) Data Processing

Davis, G.B. Introduction to Electronic Computers. 1971. Chapters 1, 2, 8, 10, 19.

Insurance Accounting and Statistical Association. Insurance Accounting - Fire and Casualty. 1965. Chapter 18.

Science Research Associates, Inc. Computing Systems Fundamentals: Overview. SRA No. 15-60.

Goshay, R.C. Information Technology in the Insurance Industry. 1964. Chapters 2-3, 6-7.

Travelers, Planning for Computer-Based Systems.

## PART 6\*

## (a) INSURANCE LAW: SUPERVISION, REGULATION AND TAXATION

(1) Background Law and Insurance

Barnes, A.J. Self Review in Business Law. 1970.

Anderson, R.A. The Insurer's Tort Law

Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapter 23.

New York (State) Insurance Department. Examination of Insurance Companies. Volume 2, Chapters 2, 3 and 5; Volume 5, p.xv-xliii; Volume 6, Chapters 1 and 2.

New York (State) Laws, Statutes, etc. New York Insurance Law. Articles I-V (except IIIa), VII, VIII, X, XIa, b, c, XII, XV (except XVa), and XVI.

(Note: The candidate is responsible only for the sections of the law as stated. If he is studying from publications such as the Consolidated Laws Service, which cite case histories as well as the law itself the candidate is not responsible for the case histories although he may find them helpful to an understanding of the law. Candidates will not be tested on those sections of the New York Laws dealing exclusively with life insurance and/or annuities.)

(2) Taxation

Andrews, E.C. "Observations on State Taxation of Casualty and Fire Insurance Companies." P.C.A.S. XLII, 1955. p. 97.

Insurance Accounting and Statistical Association. Insurance Accounting - Fire and Casualty. 1965. Chapters 11, 15, and 17.

\*Also see "Recommendations for Study", page 5.

New York (State) Laws, Statutes, etc. New York Tax Law. Section 187.

New York (State) Laws, Statutes, etc. New York Insurance Law. Article XVII.

(3) Supervision and Regulation

Hartman, G.R. Ratemaking for Homeowners Insurance. 1967. Chapters 4 and 7.

Head, G.L. Insurance to Value. 1971. Chapter 11.

Mertz, A.C. The First Twenty Years.

Carlson, T.O. "Rate Regulation and the Casualty Actuary." P.C.A.S. XXXVIII, 1951. p. 9(excluding appendices).

New York (State) Insurance Department. "The Public Interest Now in Property and Liability Insurance Regulation." (A Report to Governor Nelson A. Rockefeller, January 7, 1969.)

Hartman, G.R. and Lange, J.T. "Rate Regulation and the Casualty Actuary-Revisited." P.C.A.S. LV, p. 1.

Kimball, S.L. and Denenberg, H.S. Eds. Insurance, Government and Social Policy. 1969. Chapter 1-4, 8-10, 18.

National Association of Insurance Commissioners. Proceedings. (The last four years, Volumes I and II, should be reviewed for all discussions and committee reports relating to topics covered in section 6(a), as found in reports of the following committees:

Laws and Legislation (D). Property, Casualty and Surety Insurance (F). 1970. Laws, Legislation and Regulation (B). Property and Liability (D). 1971-73.

(b) STATUTORY INSURANCES

(1) Statutory Automobile Insurance

Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapters 11 (pp 372-386 and 411-478), 12 and 13.

Aponte, J. and Denenberg, H.S. "The Automobile Problem in Puerto Rico: Dimensions and Proposed Solution." The Journal of Risk and Insurance. 1968.

American Insurance Association. Analysis of Automobile Financial Responsibility and Related Laws. (Chart). Latest edition.

National Association of Independent Insurers. Chart Analysis of Automobile Insurance Plans. Latest edition.

Department of Transportation: A Study of Assigned Risk Plans.  
July 1970.

Hallman, G.V. Unsatisfied Judgment Funds. 1968. Chapters 1-3,  
11-14 and Appendix.

(2) Social Insurance and Allied Programs

Myers, R.J. Social Insurance and Allied Government Programs. 1965.  
Chapters I-XII, XIV and Addendum.

(This text should be read for the basic background underlying Social Security Systems in the United States. Up-to-date provisions will be found in the pamphlet Social Security Programs in the United States. Published by the U.S. Department of Health, Education and Welfare.)

New York (State) Department of Labor. "Studies in Disability Insurance." (Special Bulletin No. 224).

Schwartz, M.J. "New York Statutory Disability Benefits Law, Coverage, Rates and Rating Plans." P.C.A.S. XXXVII, 1950, p. 57.

Gaines, N. "Actuarial Aspects of Unemployment Insurance." P.C.A.S. XLIII, 1955, p. 203.

PART 7\*

(a) INSURANCE ACCOUNTING AND EXPENSE ANALYSIS

National Association of Insurance Commissioners. Proceedings.  
Blanks Committee Reports for the years subsequent to 1965 as these reports apply to the Fire and Casualty Blank.

(1) Insurance Accounting

Association form of Annual Statement Blank for Fire and Casualty Companies. (For specific illustrations, see Best's Reproductions of Principal Schedules from Casualty and Surety Statements.) The candidate should be familiar with this blank and its compilation.

Michelbacher, G.F. and Roos, N.R. Multiple Line Insurers, Their Nature and Operation. 1970, pp. 172-180.

Insurance Accounting and Statistical Association. Insurance Accounting--Fire and Casualty. 1965. Chapters 1-4, 7, 8, 13, 16.

New York (State) Insurance Department. Examination of Insurance Companies. Volume 2, Part 4.

Committee on Annual Statement. "Report on the Annual Statement." P.C.A.S. LII, 1965, p. 244.

\*Also see "Recommendations for Study", page 5.

American Institute of Certified Public Accountants. Audits of Fire and Casualty Insurance Companies. Chapter 9.

Balcarek, R.J. "Effect of Loss Reserve Margins in Calendar Year Results." P.C.A.S. LIII, 1966. p. 1.

Salzmann, R. "Schedule P on a Calendar/Accident Year Basis." P.C.A.S. LIV, 1967. p. 120.

Otteson, P.M. "Some Observations Concerning Fire and Casualty Insurance Company Financial Statements." P.C.A.S. LIII, 1965. p. 215.

Pruitt, D.M. "Uniform Accounting -- A Study of Regulation." P.C.A.S. XXXVI, 1949. p. 22.

Insurance Accounting and Statistical Association. Proceedings.

<u>Year</u>	<u>Page</u>	<u>Article</u>
1965	269	Interpretation and Analysis of Insurance Financial Statements.
1968	584	Current Proposals for Changes in Schedule P.
1969	630	Thoughts about Annual Statement Reporting.
1969	632	What is New in the 1969 Annual Statement.
1970	687	Managerial vs. Statutory Accounting.

(2) Expense Analysis

Insurance Expense Exhibit. The candidate should be familiar with this blank and its compilation.

Insurance Accounting and Statistical Association. Insurance Accounting -- Fire and Casualty. 1965. Chapters, 5, 14.

New York (State) Insurance Department. Examination of Insurance Companies. Volume 4, Part 2.

Insurance Accounting and Statistical Association. Proceedings.

<u>Year</u>	<u>Page</u>	<u>Article</u>
1963	273	Review of Uniform Accounting Instructions and Methods Used by Country Mutual in Allocating Expenses.

Morison, G.D. "1965 Study of Expenses by Size of Risk." P.C.A.S. LIII, 1966. p. 61.

## (b) PREMIUM, LOSS AND EXPENSE RESERVES

Association form of Annual Statement Blank for Fire and Casualty Companies. Pages 3, 7, 9, 27 and 32-36. (For specific illustrations as to relationship of Schedules, see Best's Reproductions of Principal Schedules from Casualty and Surety Statements).

Michelbacher, G.F. and Roos, N.R. Multiple Line Insurers, their Nature and Operation. 1970. Pages 181-202.

Insurance Accounting and Statistical Association. Insurance Accounting -- Fire and Casualty. 1965. Chapters 9, 10 and 12.

New York (State) Insurance Department. Examination of Insurance Companies. Volume 3. Chapters 2 (pp 95-126 only), 4-10.

Tarbell, T.F. "Incurred but not Reported Claim Reserves." P.C.A.S. XX, 1933. p. 275 or P.C.A.S. LVIII, 1971. p. 83.

Bornhuetter, R.L. and Ferguson, R.E. "The Actuary and IBNR." P.C.A.S. LVIV, 1972.

Balcarek, R.J. "Reserves for Reopened Claims on Workmen's Compensation." P.C.A.S. XLVIII, 1961. p. 1.

Fitzgibbon, W.J., Jr. "Reserving for Retrospective Returns." P.C.A.S. LII, 1965. p. 203.

Insurance Accounting and Statistical Association. Proceedings.

<u>Year</u>	<u>Page</u>	<u>Article</u>
1955	332	Unearned Premium Reserve Accounting
1956	308	Special Reserves in the Annual Statement Related to Group Accident and Health Coverage
1959	240	IBNR Reserves Including Reopened Cases
1959	244	IBNR Reserves Including Reopened Cases
1959	306	Establishing Adequacy of Reserves on Slow Closing Lines--Use of Paid Loss Formulae
1960	196	Unearned Premium Reserve Methods
1961	176	Loss Reserves--Case and Incurred but not Reported, Auto Lines Only
1966	129	Formula Loss Reserves
1967	171	Discussion of Active Life Reserves As Respects Loss of Time Policies
1967	498	Formula Reserving for Loss Expenses
1968	291	Testing of Loss Adjustment (Allocated) Expense Reserve
1970	550	Developments in Formula Reserving Methodology

## PART 8\*

## INDIVIDUAL RISK RATING

Note: The candidate is advised to read the first two references to become acquainted with the general principles underlying individual risk rating prior to studying the respective plans and technical articles. It is realized that parts of some technical articles cited in the recommended reading for this part are not current. However, the candidate should study all articles for their explanation of theory.

Michelbacher, G.F. and Roos, N.R. Multiple-Line Insurers, their Nature and Operation. 1970. Chapter 3.

Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapter 22.

Snader, R.H. "Fundamentals of Individual Risk Rating and Related Topics" (This study note may be obtained from the Casualty Actuarial Society at a cost of \$1.00 per copy).

## (1) Experience Rating

Dorweiler, P. "A Survey of Risk Credibility in Experience Rating." P.C.A.S. XXI, 1934. p. 1. or P.C.A.S. LVIII, 1971. p.90.

Perryman, F.S. "Experience Rating Plan Credibilities." P.C.A.S. XXIV, 1937. p. 60 or P.C.A.S. LVIII, 1971. p. 143.

Johnson, R.A. "The Multi-Split Experience Rating Plan in New York." P.C.A.S. XXVIII, 1941. p. 15.

Smith, S.E. "Interstate and Overall Rating Plans." P.C.A.S. XXXIV, 1947. p. 6.

Bailey, A.L. "Workmen's Compensation D-Ratio Revision." P.C.A.S. XXXV, 1948. p. 26.

Unthoff, D.R. "The Compensation Experience Rating Plan -- A Current Review." P.C.A.S. XLVI, 1959. p. 285.

Marshall, R.M. Workmen's Compensation Insurance Ratemaking. Revised. 1961. Appendix, section 7 only.

The candidate should study the following rating plans and the forms used in the application thereof:

National Council on Compensation Insurance:  
Experience Rating Plan

Insurance Services Office, Experience and Schedule Rating Plans applicable to:

Automobile Liability.  
Automobile Physical Damage.  
Burglary.  
General Liability.  
Glass.

\*Also see "Recommendations for Study", page 5.

Surety Association of America:  
Experience Rating Plan - Financial Institutions.  
Experience Rating Plan - Mercantile Establishments.

(2) Retrospective Rating

- Dorweiler, P. "On Graduating Excess Pure Premium Ratios." P.C.A.S. XXVIII, 1941. p. 132.
- Carlson, T.O. "An Actuarial Analysis of Retrospective Rating." P.C.A.S. XXVIII, 1941. p. 283.
- Valerius, N.M. "Risk Distributions Underlying Insurance Charges in the Retrospective Rating Plan." P.C.A.S. XXIX, 1942. p. 96.
- Smith, S.E. "Interstate and Overall Rating Plans." P.C.A.S. XXXIV, 1947. p. 6.
- Uthoff, D.R. "Excess Loss Ratios via Loss Distributions." P.C.A.S. XXXVII, 1950. p. 82.
- Leslie, W., Jr. "The National Defense Projects Rating Plan." P.C.A.S. XXXVIII, 1951. p. 174.
- Foster, R. B. "The Boiler and Machinery Adjustment Rating Plan." P.C.A.S. XLI, 1954. p. 135.
- Simon, L.J. "The 1965 Table M." P.C.A.S. LII, 1965. p. 1.
- Hewitt, C.C. "Loss Ratio Distribution - A Model." P.C.A.S. LIV, 1967. p. 70.

The candidate should study the following retrospective rating plans and the forms used in the application thereof:

National Council on Compensation Insurance:  
Retrospective Rating Plans - Plans A, B, C and J.  
Retrospective Rating Plan D.  
Retrospective Rating Plan D - Rating Supplement for Workmen's Compensation.

Insurance Services Office, Insurers Advisory Bureau:  
Retrospective Rating Plan D - Rating Supplement for Liability, Burglary and Glass Lines.

Retrospective Rating Plan D - Rating Supplement for Automobile Physical Damage.

(3) Miscellaneous Rating

- Cahill, J.M. "Deductible and Excess Coverages, Liability and Property Damage Lines Other Than Automobile." P.C.A.S. XXIII, 1936. p. 18 or P.C.A.S. LVIII, 1971. p. 115.

The candidate should study the following rating plans and the forms used in the application thereof:

Insurance Services Office  
Composite Rating Plan (Automobile, General Liability, Burglary, Glass).

Insurance Services Office  
Deductible Rating Plan (\$5000 Max.) - Fire and Allied Lines. July 1963.  
Deductible Rating Plan (\$10,000 Min.) - Fire and Allied Lines. July 1964.

## PART 9\*

## ADVANCED INSURANCE PROBLEMS

This examination will cover the following subjects:

- a) Operations of Insurance Companies
- b) Reinsurance
- c) Operations Research
- d) Ratemaking
- e) Topics of Current Interest

The candidate is expected to have acquired considerable technical knowledge and practical experience during preparation for previous examination parts. Ability to apply this knowledge and experience may be tested through questions dealing with problems for which there may be no generally recognized solutions.

The following references are indicated for particular attention:

## (a) OPERATIONS OF INSURANCE COMPANIES

Herron, S.D., Jr. "Insurance Company Investments." P.C.A.S. LII, 1965. p. 238.

National Association of Insurance Commissioners. Measurement of Profitability and Treatment of Investment Income in Property and Liability Insurance. June 1970.

Balcarek, R.J. "The Capital Investment Market and the Insurance Industry." P.C.A.S. IV, 1968. p. 186.

Kimball, S.L. and Denenberg, H.S., Eds. Insurance, Government and Social Policy. 1969. Chapter 6.

Beckman, R.W. "Federal Income Taxes". P.C.A.S. LVIII, 1971.

\*Also see "Recommendations for Study", page 5.

Ferrari, J.R. "The Relationship of Underwriting, Investments, Leverage, and Exposure to Total Return on Owners' Equity." P.C.A.S. LV, 1968. p. 295.

Hedges, B.A. "Insurance Rates and Investment Earnings Considered Together." The Journal of Risk and Insurance. Volume XXXVI, No. 4 (September, 1969). p. 455.

Ferrari, J.R. "A Theoretical Portfolio Selection Approach for Insuring Property and Liability Lines." P.C.A.S. LIV, 1967. p. 33.

Bailey, R.A. "Underwriting Profit from Investments." P.C.A.S. LIV, 1967. p. 1.

Lewis, J.R. "Observations on Mass Merchandising of Property and Liability Insurance." CPCU Annals. June, 1971. pp. 165-180.

(b) REINSURANCE

Kulp, C.A. and Hall, J.W. Casualty Insurance. 1968. Chapter 17.

Munich Reinsurance Co. Reinsurance and Reassurance. Volumes I-IV.

(c) OPERATIONS RESEARCH

Wagner, H.M. Principles of Operations Research. 1969. Chapters 1, 2, 4 (pp. 95-110), 5 (pp. 129-133), 6 (pp. 165-187), 8, 20 (pp. 837-842), and 21 (pp. 887-898).

Dorfman, R. "Operations Research." The American Economic Review. Volume L, Number 4, September 1960. (The Journal of the American Economic Association).

Zubay, Eli "Symposium on Operations Research in the Insurance Industry." Journal of Risk and Insurance. Volume XXXII, No. 3. September 1965. pp. 325-336.

(d) RATEMAKING

(1) General

Kimball, S.L. and Denenberg, H.S., Eds. Insurance, Government and Social Policy. 1969. Chapter 11.

Mayerson, A.L. "A Bayesian View of Credibility." P.C.A.S. LI, 1964. p. 85.

Mayerson, A.L., Jones, D.A., Bowers, N.L., Jr. "The Credibility of the Pure Premium." P.C.A.S. LV, 1968. p. 175.

Hewitt, C.C. "Credibility for Severity." P.C.A.S. LVII, 1970. p. 148.

Masterson, N.E. "Economic Factors in Liability and Property Insurance Claim Costs, 1935-1967." P.C.A.S. LV, 1968. p. 61.

Lange, J.T. "Application of a Mathematical Concept of Risk to Property-Liability Insurance Ratemaking." The Journal of Risk and Insurance. Volume XXXVI, No. 4. 1969.

Bailey, R.A. "Insurance Rates with Minimum Bias." P.C.A.S. L, 1963. p. 4.

(2) Property and Multiple Line

Lange, J.T. "Implications of Sampling Theory for Package Policy Ratemaking." P.C.A.S. LIII, 1966. p. 285.

Longley-Cook, L.H. "Underwriting Profit in Fire Bureau Rates." P.C.A.S. LIII, 1966. p. 305.

Whitman, A.F. and Williams, C.A. "Environmental Hazards and Rating", Journal of Risk and Insurance. Vol. XXXVII, No. 3. September 1970. pp. 419-436.

(3) Liability and Workmen's Compensation

Rosenbloom, J.S. and Lee, J.F. "Economic Consequences of Automobile Accident Injuries: An Analysis." CPCU Annals. June 1971. pp. 129-142.

Stinton, J.E. "Automobile Personal Injury Claims - A Review." CPCU Annals. June 1971. pp. 115-128.

Department of Transportation. Motor Vehicle Crash Losses and Their Compensation in the United States. March 1971.

Dropkin, L.B. "Some Considerations on Automobile Rating Systems Utilizing Individual Driving Records." P.C.A.S. XLVI, 1959. p. 165.

Bailey, R.A. and Simon, L.J. "An Actuarial Note on the Credibility of Experience of a Single Private Passenger Car." P.C.A.S. XLVI, 1959. p. 159.

Cahill, J.M. "Excess Coverage (per accident basis) for Self-Insurers: Workmen's Compensation - New York." P.C.A.S. XXVII, 1940. p. 77.

(4) Accident and Health

Bartleson, E.L. Health Insurance Provided Through Individual Policies. 1968. Chapters 4-7 and Appendices 1 and 4.

MacIntyre, D.M. Voluntary Health Insurance and Rate Making. 1962. Chapters 2-6.

Eilers, R.D. and Crowe, R.M., Eds. Group Insurance Handbook. 1965. Part IV, Chapters 13-24.

(5) Other Lines

Backman, J. Surety Rate Making. 1948. Chapters 6-8, 12, 13.

Roth, R.J. "The Rating of Crop-Hail Insurance." P.C.A.S. XLVII, 1960. p. 108.

## (e) TOPICS OF CURRENT INTEREST

The following is a list of topics of current interest in the industry with which the candidate should be familiar. Each September the Education Committee will review the topics and establish the list from which examination questions for the following year will be drawn. Consult the Secretary-Treasurer for the current list of topics.

In preparing for this subject, the candidate must do his own study and research by reading articles in the general press and in trade journals, by discussing the topics with people in the industry, and by reading whatever industry papers he can obtain.

The candidate should pay particular attention to all pertinent papers in Proceedings of the Casualty Actuarial Society for the most recent four years with special attention to the reviews. The candidate should also review the volumes for the most recent four years of the Proceedings of the National Association of Insurance Commissioners for material on these topics.

LIST OF TOPICS OF CURRENT INTEREST

Changes in the Automobile Tort Liability System.

Federal Economic Stabilization Program.

Federal Investigations and Legislation.

Insurance Accounting Problems (e.g., generally accepted accounting principles, catastrophe reserves, etc.)

Legal Insurance

Marketing Developments and Trends (e.g., mass merchandising, total security programs, etc.)

NAIC Solidity Tests and Profitability Reports.

National Health Insurance, including Health Maintenance Organizations.

Problems of the High Risk Insured (e.g., FAIR plans, assigned risk plans, windstorm pools, flood, crime.)

Rate Regulatory Problems (e.g., competitive rating laws.)

## INDEX TO READINGS

Readings are available through the library of the Insurance Society of New York, the Casualty Actuarial Society and the Society of Actuaries. However, the following information is furnished for those who wish to purchase the references.

- AICPA. Audits of Fire and Casualty Insurance Companies. American Institute of Certified Public Accounts, 606 Fifth Avenue, New York, New York 10019.
- American Insurance Association. Analysis of Automobile Financial Responsibility and Related Laws. (Chart) American Insurance Association, 85 John Street, New York, New York 10038.
- Anderson, R.A. The Insurer's Tort Law. (1971) The Insurance Press, Ocean City, New Jersey 08226.
- Backman, J. Surety Rate-Making. (1948). Surety Association of America, 110 William Street, New York, New York 10038.
- Barnes, A.J. Self Review in Business Law. (1970). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Bartleson, E.L. Health Insurance Provided Through Individual Policies. (1968). The Society of Actuaries, 208 South LaSalle Street, Chicago, Illinois 60604.
- Bickelhaupt, D.L. and Magee, J.H. General Insurance. (8th Edition) (1970). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Davis, G.B. Introduction to Electronic Computers. (2nd Edition) (1971). McGraw-Hill Book Company, Manchester Road, Manchester, Missouri 63011.
- Department of Transportation. A Study of Assigned Risk Plans. (1970). GPO Cat. No. - TD 1.17:As7. Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.
- Department of Transportation. Motor Vehicle Crash Losses And Their Compensation in the United States. GPO-1971-0-420-342. Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.
- Dorfman, Robert. "Operations Research." The American Economic Review. Vol. L, No. 4. September, 1960. Northwestern University, 629 Noyes Street, Evanston, Illinois 60201.
- Eilers, R.D. and Crowe, R.M., Eds. Group Insurance Handbook. (1965). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.

- Goshay, R.C. Information Technology in the Insurance Industry. (1964). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Hallman, G.V. Unsatisfied Judgment Funds. (1968). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Hartman, G.R. Rate-making for Homeowners Insurance. (1967). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430
- Head, G.L. Insurance to Value. (1971). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Hoel, Paul G. Introduction to Mathematical Statistics. (4th Edition). (1971) John Wiley and Sons, Inc., 605 Third Avenue, New York, New York 10016.
- Insurance Accounting and Statistical Association. Insurance Accounting - Fire and Casualty. (2nd Edition) (1965). The Spectator Company, Chestnut and 56th Streets, Philadelphia, Pennsylvania 19139.
- Science Research Associates, Inc. Computing Systems Fundamentals: Overview. SRA No. 15-60. Science Research Associates, Inc., 259 E. Erie Street, Chicago, Illinois 60611. (SRA is a subsidiary of IBM; IBM reference # GR29-0280-0.)
- Kellison, S.G. The Theory of Interest. (1970). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Kimball, S.L. and Denenberg, H.S., Eds. Insurance, Government and Social Policy. (1969). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Kulp, C.A. and Hall, J.W. Casualty Insurance. (4th Edition) (1968). The Ronald Press Co., 79 Madison Avenue, New York, New York 10016.
- Long and Gregg, Eds. Property and Liability Insurance Handbook. (1965). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- Longley-Cook, L.H. An Introduction to Credibility Theory. (1962). Casualty Actuarial Society.
- MacIntyre, D.M. Voluntary Health Insurance and Rate-Making. (1962). Cornell University Press, 124 Roberts Place, Ithaca, New York 14858.
- Marshall, R.M. Workmen's Compensation Insurance Rate-making. (Revised, 1961). Casualty Actuarial Society.

- Menge, W.O. and Fischer, C.H. The Mathematics of Life Insurance. (2nd Edition) (1965). The Macmillan Company, 866 Third Avenue, New York, New York 10022 or 1970 printing by Ulrich's Books, Inc., 549 East University, Ann Arbor, Michigan 48104.
- Mertz, A.C. The First Twenty Years. National Association of Independent Insurers. (Available in many property-liability insurance companies and from Casualty Actuarial Society Library. - Do not write to National Association of Independent Insurers).
- Michelbacher, G.F. and Roos, N.R. Multiple Line Insurers: Their Nature and Operation. (1970). McGraw-Hill Book Company, Manchester Road, Manchester, Missouri 63011.
- Multiple Life Functions. May be obtained from the Secretary-Treasurer of the Casualty Actuarial Society.
- Munich Reinsurance Company. Reinsurance and Reassurance. (Available in many property-liability insurance companies and from Casualty Actuarial Society Library. - Do not write to Munich Reinsurance Company).
- Myers, R.J. Social Insurance and Allied Government Programs. (1965). Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.
- New York (State) Dept. of Labor. Division of Research and Statistics. Studies in Disability Insurance. (1949). (Special Bulletin No.224). The New York State Department of Labor, 80 Centre Street, New York, New York 10013.
- New York (State) Insurance Dept. Examination of Insurance Companies. (1953-1955, 7 Volumes). Prepared under the supervision of Deputy Superintendent Adelbert G. Straub, Jr., New York State Insurance Department, 324 State Street, Albany, New York 12210.
- New York (State) Insurance Department. Loss and Expense Ratios. New York State Insurance Department, 324 State Street, Albany, New York 12210.
- New York (State) Insurance Department. The Public Interest Now in Property and Liability Insurance Regulation. (A report to Governor Nelson A. Rockefeller, January 7, 1969). New York State Insurance Department, 324 State Street, Albany, New York 12210.
- New York (State) Laws, Statutes, etc. New York Insurance Law. (This can be obtained from several sources, such as - The Williams Press, Inc., 99 Broadway, Menands, New York 12202; or Edward Thompson Company, 399 Gold Street, Brooklyn, New York 11201).
- New York (State) Laws, Statutes, etc. New York Tax Law. (See Sources for New York Insurance Law).

New York (State) Workmen's Compensation Board. Workmen's Compensation Tables (3% Interest) 1948. (1948). (Special Bulletin No. 222). New York Workmen's Compensation Board, 50 Park Place, New York, New York 10007.

Raiffa, H. Decision Analysis - Introductory Lectures on Choices Under Uncertainty. Addison-Wesley Publishing Company, Inc., Reading, Massachusetts 01867.

Samuelson, P.A. Economics: An Introductory Analysis. (8th Edition) (1970). McGraw-Hill Book Company, Manchester Road, Manchester, Missouri 63011.

Samuelson, P.A. Economics. (1973). McGraw-Hill Book Company, Manchester Road, Manchester, Missouri 63011.

Travelers. Planning for Computer-Based Systems. (Available in many property-liability insurance companies and from Casualty Actuarial Society Library. - Do not write to Travelers).

Wagner, H.M. Principles of Operations Research. (1969). Prentice Hall, Inc., Englewood Cliffs, New Jersey 07632.

Wallis, W. Allen and Roberts, Harry V. The Nature of Statistics. (1965). (Paperback). Free Press, Division of the Macmillan Company, 866 Third Avenue, New York, New York 10022.

Wallis, W. Allen and Roberts, Harry V. Statistics: A New Approach. (1956) Free Press, Division of the Macmillan Company, 866 Third Avenue, New York, New York 10022.

Willett, A.H. Economic Theory of Risk and Insurance. (1951) Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.

## PART 1 GENERAL MATHEMATICS

REPRESENTATIVE TEXTBOOKS

The General Mathematics Examination is based on material usually covered in undergraduate mathematics courses through the differential and integral calculus. There are many textbooks used in American and Canadian colleges which adequately cover the material upon which the candidate may be examined. The four items listed below may be considered representative of this class of textbooks. Any one of these may be helpful for students who have not had courses covering these topics.

Thomas, G.B. Jr.  
Calculus and Analytic Geometry (4th Edition)  
 Addison-Wesley Publishing Company, Inc.  
 Reading, Massachusetts 01867

Johnson, R.E., and Kiokemeister, F.L.  
Calculus with Analytic Geometry (4th Edition)  
 Allyn and Bacon, Inc.  
 Rockleigh, New Jersey 07647

Protter, M.H. and Moreey, C.B. Jr.  
College Calculus with Analytic Geometry  
 Addison-Wesley Publishing Company, Inc.  
 Reading, Massachusetts 01867

Purcell, E.J.  
Calculus with Analytic Geometry  
 Appleton-Century-Crofts, Inc.  
 440 Park Avenue South  
 New York, New York 10016

## PART 2 PROBABILITY AND STATISTICS

REPRESENTATIVE TEXTBOOKS

Hoel, P.G.  
Introduction to Mathematical Statistics (4th Edition)  
 John Wiley & Sons, Inc.  
 605 Third Avenue  
 New York, New York 10016

Hogg, R.V. and Craig, A.T.  
Introduction to Mathematical Statistics (3rd Edition)  
 Macmillan Company  
 866 Third Avenue  
 New York, New York 10022

Hoel, P.G., Port, S.C., and Stone, C.J.  
Introduction to Probability Theory and Introduction to Statistical Theory  
 Houghton Mifflin Company  
 Boston, Massachusetts

ADDRESSES OF OTHER ORGANIZATIONS  
WHOSE MATERIAL IS SUGGESTED READING

A. M. Best Co., Inc.  
One Park Avenue  
Morristown, New Jersey 07964

American Mutual Insurance Alliance  
20 North Wacker Drive  
Chicago, Illinois 60606

CPCU Annals  
Penn State Building  
Media, Pennsylvania 19063

Health Insurance Association of America  
1701 K Street, NW  
Washington, D.C. 20006  
or  
750 Third Avenue  
New York, New York 10017

or  
332 South Michigan Avenue  
Chicago, Illinois 60604

Insurance Accounting and Statistical Association  
3520 Broadway  
P.O. Box 139  
Kansas City, Missouri 64111

Insurance Information Institute  
110 William Street  
New York, New York 10038

Insurance Services Office  
160 Water Street  
New York, New York 10038

Insurance Services Office  
New England Regional Office  
Three Center Plaza  
P.O. Box 2057  
Boston, Massachusetts 02106

The Journal of Risk and Insurance  
112 E. Washington Street  
Bloomington, Illinois 61701

National Association of Independent Insurers  
2600 River Road  
Des Plaines, Illinois 60018

ADDRESSES OF OTHER ORGANIZATIONS  
WHOSE MATERIAL IS SUGGESTED READING

National Association of Insurance Commissioners  
660 E. Mason Street  
Milwaukee, Wisconsin 53202

National Council on Compensation Insurance  
200 East 42nd Street  
New York, New York 10017

The National Underwriter Company  
420 E. Fourth Street  
Cincinnati, Ohio 45202

The Weekly Underwriter  
116 John Street  
New York, New York 10038

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