CASUALTY 
ACTUARIAL SOCIETY 
ORGANIZED 1914

RECOMMENDATIONS FOR STUDY
(1975 Syllabus)

RULES REGARDING EXAMINATIONS FOR ADMISSION
SYLLABUS OF EXAMINATIONS
RECOMMENDATIONS FOR STUDY

OFFICE OF THE SOCIETY

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

Twentieth Edition, 1975
Important Notice to Candidates for
Parts 4, 6, 8 and 10 of the May, 1976 Examinations

While the Recommendations for Study will not include any major modifications to the syllabus of examinations, certain texts have become difficult to obtain, necessitating changes. In addition, a few new readings have been added. This bulletin outlines the changes in the syllabus for Parts 6, 8 and 10 of the exams. Naturally, readings not specifically referred to in this bulletin are still required for these three parts.

For Part 4, on the other hand, a complete, new syllabus is attached. The Zubay, Goshay and Science Research Associates readings have been deleted from 4(b). Chapter references for the Jordan, Wagner and Raiffa texts have been significantly altered. Only the references to the Ferguson and the Cozzolino and Freifelder papers are unchanged. These changes resulted from an analysis of the results of last May's exam, feedback from students, and a desire to condense the number of readings required for this exam.

The 1976 Recommendations for Study will incorporate these changes and will be printed in the very near future. It will be mailed to all members and students as soon as it is available from the printer.

att.
(a) LIFE CONTINGENCIES

Jordan, C.W. Life Contingencies. 1967. Chapters 1 (omitting Section 5), 2 (omitting Section 6), 3, 4 (omitting Sections 2 and 3), 5 (omitting Sections 6, 7, 8 and 11), 6 (omitting Sections 4 and 5), 7 (Sections 1, 2 through formula 7.1 and 3 through formula 7.7 only), 8 (Section 3 only), 9 (Sections 1, 2 and 3 only).

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

(b) OPERATIONS RESEARCH, DECISION THEORY, DATA PROCESSING

Davis, G.B. Introduction to Electronic Computers. 1971
Chapters 1, 2, 3, 4, 5, 8, 10, 19.


Insurance companies have found that operations research techniques may be applied in solving insurance problems. Occasionally, an actuary may be assigned a specific work problem which would be most expeditiously solved by operations research methods. Frequently, there will be more than one way of solving a complex actuarial problem and a familiarity with operations research techniques can help the actuary select the one best suited to the problem.

It is not expected that this examination will make the candidate an operations research expert. Rather, it is designed to introduce the student to Operations research, much in the way a one-semester, first course in the subject would. This is accomplished by selecting several important operations research techniques and requiring that the candidate learn them in detail, including an ability to solve numerical problems. Other operations research techniques are simply surveyed and the candidate is required only to have a general familiarity, knowing when the technique should be applied.

The following sections of the Wagner text are those for which the candidate is expected to be able to recognize applications of the technique, set up problems and work numerical problems. The test will include both short-answer objective questions and longer problems on this subject matter.

Chapters 2, 3 (pp. 77-85), 4 (pp. 95-110), 5 (pp. 129-143), 8 (pp. 253-260), 20 (pp. 837-869) in the first edition (1969)
or

Chapters 2, 3 (pp. 73-81), 4 (pp. 91-106), 5 (pp. 127-145), 8 (pp. 263-270), 20 (pp. 851-884) in the second edition (1975).
In the remaining sections, listed below, the candidate will not be required to reproduce mathematical formulas, to set up problems or to work numerical examples. However, he will be expected to recognize the type of problem to which these techniques might apply. For this section, the test will consist solely of short-answer questions.

Wagner, H.M. *Principles of Operations Research.*
Chapters 1, 11 (pp. 359-372), 16 (pp. 639-671), 21 (pp. 887-898), and 22 in the first edition (1969)

or

Chapters 1, 11 (pp. 383-396), 16 (pp. 651-677), 21 (pp. 903-915), and 22 in the second edition (1975).

The following paper is given as an example of an application of an operations research approach to an insurance problem. The candidate will not be asked to reproduce formulas or work examples. He will be expected to know which OR techniques were employed and how they were used for the particular insurance situation described in the paper. Only short-answer question(s) will be asked on this paper.

PART 6

(a) PRINCIPLES OF RATEMAKING

1. Replace the reference to "Classification Rate Making," Chapter 11, Casualty Contingencies with:

   Casualty Contingencies (exposure draft), Chapter 10 "Organization and Analysis of Risk Data," Chapter 11 "Classification Rate Making" and Chapter 12 "Individual Risk Rate Making" (available from the CAS office).

2. Replace the reference to Marshall's Workmen's Compensation Insurance Rate Making with:

   Kallop, R. "Workers' Compensation Insurance Rate Making" (available from the CAS office).

(b) INSURANCE STATISTICS

   There are no changes in the syllabus for this part.

PART 8

(a) INSURANCE LAW: SUPERVISION AND REGULATION

   Delete the reference to New York Insurance Department's Examination of Insurance Companies

(b) STATUTORY INSURANCES

   Replace the reference to Myers' Social Insurance and Allied Government Programs with:

   Myers, R.J. Social Security 1975, Chapters 1-11, 13 and 15.
PART 10

(a) OPERATIONS OF INSURANCE COMPANIES

Add the following three references:


(b) REINSURANCE AND EXCESS RATING

Replace the reference to Chapter 14 of Casualty Contingencies with:

Casualty Contingencies (exposure draft) Chapter 13 "Deductibles, Excess Covers and Coinsurance Clauses" and Chapter 14 "Non-Proportional Reinsurance, Retentions and Surplus" (available from the CAS office).

Add the following four references:


(c) FORECASTING

This new section was added in response to the increasing involvement of actuaries in the forecasting and planning functions of insurance companies. The four readings required for the 1976 syllabus are of a general nature and students are advised to prepare for questions which will test his ability to apply these principles to insurance problems. The readings (other than the McGuinness article) are available at cost from the CAS office.


(d) TOPICS OF CURRENT INTEREST

The list of topics of current interest is replaced by the following list:

Changes in the Automobile Tort Liability System.

Federal Investigations and Legislation (e.g., liability hazards created by the Employee Retirement Income Security Act of 1974).

Insurance Accounting Problems (e.g., see Financial Accounting Standards Board papers on catastrophe reserves, price level accounting and foreign exchange accounting).

Legal Insurance.

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

NAIC Examination of Insurance Companies (including the McKinsey Report).

National Health Insurance, including Health Maintenance Organizations.

Problems of the High Risk Insured (e.g., FAIR plans, Facilities, Joint Underwriting Associations, assigned risk plans, windstorm pools, flood, crime).
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
Casualty Actuarial Society
200 East 42nd Street
New York, New York 10017

<table>
<thead>
<tr>
<th>Old Book</th>
<th>New 1975</th>
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<tbody>
<tr>
<td>Part 5 Readings applies to Part 6</td>
<td>$3.00</td>
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<tr>
<td>Part 6 Readings applies to Part 8</td>
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<td>Part 7</td>
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<tr>
<td>Chapter 11 - Part 6</td>
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<tr>
<td>Chapter 14 - Part 10</td>
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</tbody>
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Part Exams
Old Syllabus 1974
Part 5

New Syllabus
Part 6

Chapter 14 for Part 10
Chapter 11-10-12 for Part 6
RULES REGARDING EXAMINATIONS FOR ADMISSION

(Effective with May 1975 Examinations)

1. Dates of Examinations

<table>
<thead>
<tr>
<th>Part</th>
<th>1975</th>
<th>1976 and thereafter</th>
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<tbody>
<tr>
<td>1</td>
<td>May, November</td>
<td>May, November</td>
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<td>2</td>
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<td>10</td>
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</table>

The Secretary 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 one or more of Parts 1, 2 and 3 must make application on the Society's application form, which may be obtained from the Secretary.

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, 2 and 3, need not again make use of the Society's application form, but may simply write to the Secretary, 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 by April 1 for the Spring examinations and by October 1 for the Fall examinations.

3. Joint Administration

Part 1, the General Mathematics examination, Part 2, the Probability and Statistics examination and Part 3, the Numerical Analysis and Theory of Interest examination, are jointly administered 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.
4. Associateship and Fellowship Examinations

In 1975 and 1976 satisfactory completion of (or credit for) examinations 1 through 6 is required in order to fulfill the examination requirements for Associateship. After 1976, examinations 1 through 7 will be required.

Satisfactory completion of (or credit for) all ten examinations is required in order to fulfill the examination requirements for Fellowship.

5. Fees

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

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<tr>
<th>Parts</th>
<th>Fee</th>
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<tr>
<td>1, 2</td>
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<td>3</td>
<td>$12.50</td>
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<tr>
<td>4-10</td>
<td>$20.00</td>
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</table>

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 before April 1 for the Spring examinations, or before October 1 for the Fall examinations.

6. 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 examinations. These prize awards are granted for both the Spring and Fall examinations.

7. Credit for Examination Parts Under Former Syllabus

A candidate who has passed, or been credited with, one or more of the examinations under the 1974 Syllabus will receive credit for the corresponding examinations of the 1975 Syllabus in accordance with the following table:

<table>
<thead>
<tr>
<th>Parts Passed or Credited Under 1974 Syllabus</th>
<th>Parts Credited Under 1975 Syllabus</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
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<td>2</td>
<td>2</td>
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<td>3</td>
<td>3 and 4(a)</td>
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<td>4</td>
<td>4(b) and 5</td>
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<td>5</td>
<td>4(b) and 6</td>
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<td>8</td>
<td>9(b)</td>
</tr>
<tr>
<td>9</td>
<td>9(a) and 10</td>
</tr>
</tbody>
</table>
On application to the Secretary, partial Part 4 examinations will be given in May 1975 and May 1976 to those candidates requiring them in accordance with the above credits. Similarly, partial Part 9 examinations will be given in May 1975, November 1975 and November 1976 for those candidates requiring such partial examinations. Beginning with the 1977 examinations, no candidate will be permitted to write only a portion of either the Part 4 or the Part 9 examination and all partial credits will expire.

8. 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:

<table>
<thead>
<tr>
<th>Casualty Actuarial Society</th>
<th>Society of Actuaries</th>
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<tbody>
<tr>
<td>Part 1</td>
<td>Part 1, General Mathematics, passed prior to 1963 (before joint administration)</td>
</tr>
<tr>
<td>Part 2</td>
<td>Part 2, Probability and Statistics, passed prior to 1966 (before joint administration)</td>
</tr>
<tr>
<td>Part 3</td>
<td>Part 3, Numerical Analysis (or Finite Differences) and Theory of Interest (or Compound Interest)</td>
</tr>
<tr>
<td>Part 4(a)</td>
<td>Part 4, Life Contingencies</td>
</tr>
</tbody>
</table>

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 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. The CAS Library is located at 200 East 42nd Street, New York, N.Y. 10017.

Registered candidates may have access to the library by receiving from the Society's Secretary 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.

Address requests for books to:

Secretary
CAS Library Service
200 East 42nd Street
New York, N.Y. 10017

AMERICAN ACADEMY OF ACTUARIES

Satisfactory completion of specified examinations 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 1975 Examinations)

<table>
<thead>
<tr>
<th>Part</th>
<th>Subject</th>
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<tbody>
<tr>
<td>1</td>
<td>General Mathematics*</td>
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<tr>
<td>2</td>
<td>Probability and Statistics*</td>
</tr>
<tr>
<td>3</td>
<td>Numerical Analysis and Theory of Interest*</td>
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</tbody>
</table>
| 4    | (a) Life Contingencies  
(b) Operations Research, Decision Theory, Data Processing |
| 5    | Principles of Economics, Theory of Risk and Insurance Forms, Coverages, Underwriting, Product Design, Marketing |
| 6    | Principles of Ratemaking and Insurance Statistics |
| 7    | Insurance Accounting and Expense Analysis  
Premium, Loss, and Expense Reserves |
| 8    | Insurance Law; Supervision and Regulation  
Statutory Insurances |
| 9    | (a) Advanced Ratemaking  
(b) Individual Risk Rating |
| 10   | Operations of Insurance Companies, Reinsurance,  
Topics of Current Interest |

* Jointly administered with the Society of Actuaries
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, 2, and 3 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.

A study note has been prepared to assist the student in connection with the Part 9 examination and can be obtained from the Secretary'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 of the Society. Also available without charge is a note entitled "Hints on Study and Exam Techniques".

Readings from out-of-print Proceedings of the Casualty Actuarial Society are available from the Society's office as follows:

<table>
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<tr>
<th>Part</th>
<th>Price</th>
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<tbody>
<tr>
<td>Part 6</td>
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<td>Part 8</td>
<td>$3.00</td>
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<td>Part 9(b)</td>
<td>$5.00</td>
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<td>Parts 7, 9(a)</td>
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Old Part 5:

<table>
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<th>Price</th>
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<tbody>
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<td>Part 8</td>
<td>$3.00</td>
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<tr>
<td>Part 9</td>
<td>$5.00</td>
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Copies of examinations for recent years and sample examination questions may be obtained from the Secretary.
PART 1

GENERAL MATHEMATICS
(Jointly administered 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 32 of this syllabus.

PART 2

PROBABILITY AND STATISTICS
(Jointly administered 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 (CUFM) 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 32 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 further practice in solving problems is Theory and Problems of Statistics by M. R. Spiegel (Schaum's Outline Series, McGraw-Hill). A second 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
NUMERICAL ANALYSIS AND THEORY OF INTEREST
(Jointly administered by the Casualty Actuarial Society and the Society of Actuaries.)

This three-hour multiple choice examination covers the two separate subjects of Numerical Analysis and Theory of Interest. The examination is based on the material listed for Kellison's two textbooks.

(a) Numerical Analysis

This subject encompasses various techniques for handling numerical data. Although many of the principles dealt with lend themselves readily to computer procedures and methods, knowledge
of such procedures or methods is neither presupposed nor required for the examination.

The general scope of the Numerical Analysis section of the examination is indicated by the following topics:

Finite differences, interpolation with equal and unequal intervals, central differences, summation, numerical methods of integration and differentiation, difference equations, successive approximation or iterative techniques, numerical methods of handling matrices and determinants, and numerical approaches to linear systems of equations.

Kellison, S.G. *Fundamentals of Numerical Analysis*. 1974. Chapters 1-4, Chapter 5 (Sections 1-5 and 8-10), Chapter 6 (Sections 1-5), Chapter 7 (Sections 1-5), Chapter 8 (Sections 1-4 and 6-8), Chapter 9 (Sections 1-3), Chapters 11 and 12, Chapter 13 (Sections 1-8).

(b) Theory of Interest

The general scope of this subject is indicated by the following topics:

Measurement of interest, accumulation and discount, present value, forces of interest and discount, equations of value, annuities, perpetuities, amortization and sinking funds, yield rates, bonds and other securities, installment loans, depreciation, depletion and capitalized cost.

The emphasis is primarily on problem-solving and secondarily on theoretical considerations. Recourse is made, as needed, to methods from the calculus and classical algebra in order to present a broad perspective of both the practical and the theoretical aspects of this subject. The student will also be expected to be able to apply elementary numerical analysis techniques in solving some problems. Basic computations are made by reference to standard tabulated interest functions, a sheet of which is supplied at the examination. A copy of this sheet will be sent, after the examination fee has been paid, to all students applying for the examination.

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.)

For many students, Part 3 is the first actuarial examination for which they will be preparing without the benefit of a formal course in the subject material. These students will find it helpful to maintain contact with other Part 3 students and
to take advantage of opportunities to discuss with others questions that are considered difficult. Students should not hesitate to consult members of the profession in their own organizations or elsewhere who are knowledgeable on these subjects.

The examinations are drafted by the Part 3 Committee with the intention of testing the student's knowledge of the subject matter included in the texts and every effort is made to ensure that the questions fall within the scope of the texts. Trick questions are deliberately avoided, and the wording of each question is considered carefully to eliminate possible ambiguities. Each Part 3 examination is thoroughly reviewed in relation to all these factors by Officers of the Education and Examination Committees of both the Society of Actuaries and the Casualty Actuarial Society.

The Part 3 examinations are not published. However, a set of illustrative questions will be sent, after the examination fee has been paid, to students applying for the examination for the first time. Future examinations may vary somewhat from this set of questions as to the proportion of questions of various styles and subjects; new forms of questions may appear from time to time and the total number of questions may be increased or decreased. After having covered the study material thoroughly, students may wish to test themselves individually by trying to answer the illustrative questions within the indicated allotted time. Such a test will not only provide practice in answering multiple-choice questions but may also indicate areas requiring further work and study.

Scoring of the Part 3 examination will be done in such a way that there is no advantage or disadvantage to be anticipated from guessing answers in a purely random fashion as compared with omitting the answers entirely. The final decision as to where the pass mark shall be set is arrived at by consultation among the Officers of the Education and Examination Committees of the Society of Actuaries and the Casualty Actuarial Society, and the Chairman of Part 3. In fixing the pass mark, consideration is given both to the performance level of students' answers and to the comparative difficulty of the examination, in relation to those of previous years. Any peculiarities in connection with the answers to any questions on the examinations that show up, despite all the care taken in setting the examinations, are given appropriate recognition.
PART 4*

(a) LIFE CONTINGENCIES

Jordan, C.W. *Life Contingencies*. 1967. Chapters 1 (omitting Section 5), 2, 3, 4 (omitting Section 2), 5 (omitting Sections 6, 7, and 8), 6, 7 (Sections 1, 2, and 3 only), 8 (Section 3 only), 9, 10 (omitting Section 3), 11 (Sections 1 through 5 only), 13 (Sections 1 and 2 only).


(b) OPERATIONS RESEARCH, DECISION THEORY, DATA PROCESSING

Wagner, H.M. *Principles of Operations Research*. 1969. Chapters 1, 2, 3 (pp. 77-85), 4 (pp. 95-110), 5 (pp. 129-133), 6 (pp. 165-187), 8, 10, 11 (pp. 359-372), 13 (pp. 445-459), 14 (pp. 513-528), 16 (pp. 639-671), 20 (pp. 837-869), 21 (pp. 887-898), and 22.


Raiffa, H. *Decision Analysis - Introductory Lectures on Choices Under Uncertainty*.


PART 5

(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:


*Also see "Recommendations for Study", page 6.


(b) FORMS, COVERAGES, UNDERWRITING, PRODUCT DESIGN, MARKETING

(1) Policy Forms and Insurance Coverages

The candidate should be familiar with the policy provisions and the bases of exposure used in the respective lines of insurance, with emphasis on basic coverages and features common to all lines as well as those peculiar to specific lines or types.

The manual sections listed should be studied as illustrative of the part played by manuals in the forms and coverages area. Where separate manuals are published by states, use a typical state.

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. The candidate will be held responsible for knowledge of the following policy forms (not the associated endorsements): Family Auto, Homeowners, Workmen's Compensation. Copies of current insurance contracts may be obtained from a carrier or references may be made to the book or kit of sample policies cited herein.

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


American Mutual Insurance Alliance.

or

Insurance Information Institute.

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.

National Council on Compensation Insurance.

(2) Underwriting

The candidate should be familiar with the insurance underwriting function and its basic purpose, principles and activities. In addition to the listed references, those portions of the chapters in sub-section (1) which pertain to underwriting should be studied.


(3) **Product Design and Marketing**

The student should have an understanding of marketing concepts and considerations, including marketing research and product design and development. He should be prepared to discuss the application of this to the insurance process and product - policies, sales and pricing. The reference is not an insurance text and, in studying it, the student may omit the questions, problems, case histories and appendix. He should attempt to develop analogies in the insurance business.


**PART 6**

(a) **PRINCIPLES OF RATEMAKING**

It is recommended that the student study references in the order listed.


  "Classification Ratemaking", an exposure draft of Chapter 11 from the planned Casualty Contingencies textbook (available from the C.A.S. office).


*Also see "Recommendations for Study", page 6.


Walters, M.A. "Homeowners Insurance Ratemaking." P.C.A.S. LXI, 1974. (Until Volume LXI of the Proceedings is published, copies of this paper will be available from the C.A.S. office.)


Head, G.L. Insurance to Value. 1971. Chapters 1, 2, 6-8, and Appendices 1-4.


(b) INSURANCE STATISTICS

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, and the sources and uses of external statistics, particularly as they may be required in insurance administration and ratemaking. References are listed in the suggested order for study.


Insurance Services Office. Automobile Statistical Plan.


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, A.M., Co.
Best's Insurance Reports - Property/Liability.
Best's Reproductions of Convention Statements - Property/Liability.
Best's Aggregates and Averages - Property/Liability.
Best's Executive Data Service.

The National Underwriter. 233 - 3953
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.

PART 7*

(a) INSURANCE ACCOUNTING AND EXPENSE ANALYSIS

National Association of Insurance Commissioners. Proceedings. Blanks Committee Reports for the years subsequent to 1969 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 Convention Statements - Property/Liability.) The candidate should be familiar with this blank and its compilation.

*Also see "Recommendations for Study", page 6.


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


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<td>Interpretation and Analysis of Insurance Financial Statements.</td>
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<td>1968</td>
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(2) Expense Analysis

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


Year  Page  Article


(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 Convention Statements - Property/Liability.)


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


Year  Page  Article

1955  332  Unearned Premium Reserve Accounting.


1967  171  Discussion of Active Life Reserves As Respects Loss of Time Policies.
PART 8*

(a) INSURANCE LAW: SUPERVISION AND REGULATION

(1) Background Law and Insurance

- New York (State) Insurance Department. Examination of Insurance Companies. Volume 2, Chapters 2, 3 and 5; 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, 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) Supervision and Regulation

- Mertz, A.C. The First Twenty Years.

*Also see "Recommendations for Study", page 6.
National Association of Insurance Commissioners. Proceedings. The Introduction should be read and then for the last two 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:


(b) STATUTORY INSURANCES

(1) Statutory Automobile Insurance


(2) Social Insurance and Allied Programs


(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.


*Publication &dollar; 0.75, Price &dollar; 0.45 to subscribe all. 783.

*Student must get this on his own
PART 9*

(a) ADVANCED RATEMAKING

(1) General


(2) Property and Multiple Line


(3) Liability and Workmen's Compensation


*Also see "Recommendations for Study", page 6.


(4) Accident and Health


(5) Other Lines

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


(b) INDIVIDUAL RISK RATING

Note: Candidates unfamiliar with the general principles underlying individual risk rating plans should review Michelbacher and Roos, Chapter 3, and Kulp and Hall, Chapter 22, before studying the required readings for this part. 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.

(1) General

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.)

(2) Experience Rating


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 Rating Office, Experience and Schedule Rating Plans applicable to:
General Liability

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

(3) Retrospective Rating


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

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

- Insurance Services Office:
  - Retrospective Rating Plan D - Rating Supplement for Liability, Burglary and Glass Lines.
  - Retrospective Rating Plan D - Rating Supplement for Automobile Physical Damage.

4) Miscellaneous Rating


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 ($10,000 Min.) - Fire and Allied Lines. July 1964.

* Student Signature
PART 10*

(a) OPERATIONS OF INSURANCE COMPANIES

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:


*Also see "Recommendations for Study", page 6.

*Indefinitely out of stock
(b) REINSURANCE


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

"Non-Proportional Reinsurance, Retentions and Surplus", an exposure draft of Chapter 14 from planned Casualty Contingencies textbook (available from the C.A.S. office).

(c) 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 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

Captive Insurance Companies.

Changes in the Automobile Tort Liability System.

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 Early Warning and Profitability Reports.

NAIC Examination of Insurance Companies (including the McKinsey Report).

National Health Insurance, including Health Maintenance Organizations.

Problems of the High Risk Insured (e.g., FAIR plans, Facilities, Joint Underwriting Association, assigned risk plans, wind-storm pools, flood, crime).

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

Business economics N III, May 1973

(pamphlet)
INDEX TO READINGS

Readings are available through the library of the Casualty Actuarial Society. 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 Accountants, 656 Fifth Avenue, New York, New York 10019.

American Institute for Property and Liability Underwriters, Readings in Underwriting. American Institute for Property and Liability Underwriters, Providence and Sugartown Roads, Malvern, Pennsylvania 19355.


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.)


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.)


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.)


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.
Addison-Wesley Publishing Company, Inc.
Reading, Massachusetts  01867

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

Protter, M.H. and Moreeey, 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.
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.
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
406 West 34th Street
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

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

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
PART 9 (LATEST TWO EXAMS)

PART 8 & 9 (LATEST TWO EXAMS)

PART 6 (LATEST TWO EXAMS)

PART 7 (LATEST TWO EXAMS)

PART 5 (LATEST TWO EXAMS)

PART 4 (LATEST TWO EXAMS)

SAMPLE QUESTIONS

SAMPLE QUESTIONS - SOA

SAMPLE QUESTIONS - SOA

SAMPLE QUESTIONS - SOA

EXAMS TO BE SENT

Exam Questions

NEW PART
ADDRESSES OF OTHER ORGANIZATIONS
WHOSE MATERIAL IS SUGGESTED READING

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

Surety Association of America
125 Maiden Lane
New York, New York 10038

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