

**JOINT BOARD FOR THE ENROLLMENT OF ACTUARIES  
AMERICAN SOCIETY OF PENSION PROFESSIONALS AND  
ACTUARIES**

**SOCIETY OF ACTUARIES**

**EXAMINATION PROGRAM**

**MAY 2022 BASIC (EA-1) EXAMINATION**

**MAY 2022 PENSION EA-2 (SEGMENT L) EXAMINATION**

**NOVEMBER 2022 PENSION EA-2 (SEGMENT F) EXAMINATION**

**January 2022  
Revised January 19, 2022**

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## INTRODUCTION

The Joint Board for the Enrollment of Actuaries administers two actuarial examinations that must be successfully completed by individuals to satisfy the actuarial knowledge requirement for the designation of Enrolled Actuary.

The actuarial knowledge requirement for enrollment is augmented by a requirement that a candidate have certain responsible pension actuarial experience. Through a combined knowledge and experience requirement, the Joint Board seeks to determine which applicants for the designation of Enrolled Actuary have the skills necessary to protect the interests of pension plan participants.

The examinations are structured as follows:

The EA-1 examination is two-and-one-half hours in length and covers (1) the mathematics of compound interest and practical financial analysis and (2) the mathematics of life contingencies and practical demographic analysis.

The pension (EA-2) examination consists of two segments:

- (a) The EA-2 (Segment L) law examination (formerly EA-2 (Segment B)) is two-and-one-half hours in length and covers relevant pension laws (in particular the provisions of the Employee Retirement Income Security Act (ERISA) and related laws, regulations, and rulings) as they affect pension actuarial practice. The EA-2 (Segment L) examination presupposes knowledge of the topics covered in the EA-1 examination.
- (b) The EA-2 (Segment F) examination (formerly EA-2 (Segment A)) is four hours in length and covers the selection of actuarial assumptions and calculation of minimum required and maximum tax-deductible contributions under current pension law, along with the related actuarial mathematics. The EA-2 (Segment F) examination presupposes knowledge of the topics covered in the EA-1 and EA-2 (Segment L) examinations.

EA-1 and the EA-2 (Segment L) examinations are given in May; the EA-2 (Segment F) examination is given in November.

A candidate for enrollment may be able to satisfy part of the actuarial knowledge requirement of the Joint Board regulations by earning a degree in actuarial mathematics or its equivalent from an accredited college or university. Such candidates will not have to pass the EA-1 examination. The courses in the plan of study and their successful completion must comply with guidelines adopted by the Joint Board for determining what demonstrates the requisite knowledge. The Joint Board will grant a waiver of the EA-1 examination to any candidate who received credit from the Society of Actuaries (SOA) for Courses FM and either MLC or LTAM of the SOA's education and examination program. Under either approach, the candidate must apply to the Joint Board for a waiver of the EA-1 examination as outlined on the Joint Board website at <http://www.irs.gov/Tax-Professionals/Enrolled-Actuaries/Joint-Board-Examination-Program>.

Under the Joint Board regulations as amended March 31, 2011, successful completion of both segments of the EA-2 examination must occur within 10 years prior to the date an individual applies for enrollment. The date of successful completion of an examination is the date a candidate sits for the examination on which he/she receives a passing grade from the Joint Board.

Both the EA-1 and EA-2 actuarial examinations consist solely of multiple-choice questions. Each question will be assigned from one to five points. Point values for each question will be shown at the beginning of the question. The score on each examination is based on the questions answered correctly; no credit is given for omitted answers and no credit is deducted for wrong answers.

## ALL EXAMINATIONS

Most examination questions require arithmetical computations. Each candidate should bring an electronic calculator to the examination center for use in performing computations. Calculators should be able to compute financial functions such as amortization payments, present and future values, interest rates, time periods, logarithmic functions, and exponential functions. Calculators are permitted subject to the following conditions:

The examination supervisor will ascertain that all calculators:

- have self-contained power sources,
- are noiseless, and
- do not have the capability to retain text.

A candidate generally will be allowed to take the examination using a questionable calculator. However, any questions raised as to the appropriateness of a calculator will be noted on the supervisor's report along with the candidate's number and the make and model number of the calculator; a determination will be made later as to whether the calculator was permissible.

Candidates are solely responsible for the proper functioning and operation of their calculators during the examination. In addition, candidates must indicate on their examination answer sheets both the make and the model number of any calculator used.

The use of a calculator that does not meet the conditions above constitutes an irregularity and may be sufficient cause for disqualification from the examination.

In preparing the examinations, great care is taken so that each question has one and only one correct answer based on the data given. Each question is reviewed by all members of the Advisory Committee on Actuarial Examinations and by representatives of the sponsoring organizations. Nevertheless, because mistakes can occur, a request for consideration of an alternative answer to a given question, or for disregarding a question, will be entertained by the Joint Board but only under the following conditions:

An appeal must be made in writing and postmarked no later than six months after the examination was administered.

The appellant must describe in detail the fault found with the question and an alternative answer if one is claimed.

In the case of claimed ambiguity, credence will be given to an alternative interpretation only to the extent that such interpretation is one that might be reasonably made and is not strained in the light of attendant circumstances. This policy is of positive benefit to most candidates; otherwise, it would be necessary to burden each question with numerous qualifications and stipulations that the qualified practitioner does not require and which would make the question more difficult to read.

Not all topics listed in the syllabus of this examination program are necessarily covered on any particular year's examination, nor are the examination questions necessarily confined solely to the listed topics or suggested readings. Also, it is assumed that all candidates are familiar with the basic concepts and techniques of algebra and calculus.

Candidates are urged to develop a thorough understanding of the conditions generally or specifically applicable to all examination questions as set forth later in this examination program. Conditions for each examination will be included in the applicable examination booklets.

In addition, candidates should familiarize themselves with the list of limits, tables, and formulas applicable to the EA-2 (Segment F) and EA-2 (Segment L) examinations, as set forth in this program. A copy of the appropriate list will also be included in the respective examination booklet.

# BASIC EA-1 EXAMINATION

## MAY 2022

The EA-1 examination is two-and-one-half hours in length and covers (1) the mathematics of compound interest and practical financial analysis and (2) the mathematics of life contingencies and practical demographic analysis.

Questions on the Basic EA-1 examination may contain commutation functions. **Candidates are expected to understand and be able to use commutation functions.** Candidates who are not familiar with commutation functions may wish to read the SOA Study Note "[Commutation Functions](#)".

### SYLLABUS

#### Mathematics of Compound Interest and Financial Analysis

Nominal and effective rates of interest and discount, force of interest, accumulated value factors, and present value factors.

All forms of annuities including, but not limited to annuities certain, increasing and decreasing annuities, annuities in which the payment frequency is not the same as the frequency at which interest is compounded, and perpetuities.

Amortization schedules and sinking funds, including the determination of outstanding principal, the split of payments into principal and interest, and the determination of required periodic payments.

Bonds and related securities, including bond price formulas, bond accounting, the split of periodic payments into amortization and interest, mortgages, and variable interest securities.

Determination of fund yield rates and effective rates of return using time-weighted and dollar-weighted methods.

Duration and immunization of cash flows.

Asset reporting, including realized and unrealized gains/losses, asset reconciliation, book value versus market value, and receivables.

Financial analysis, including inflation and its role, elements of risk and uncertainty, yield curves and available investments, and employee compensation increases.

#### Mathematics of Life Contingencies and Demographic Analysis

Measurements and demographic analysis of mortality, including the definition and application of standard mortality probability symbols and force of mortality.

Approximation of fractional period decrements using a uniform distribution assumption.

Measurement and demographic analysis of disability, employee turnover and employee retirement, including construction of single and multiple decrement tables.

Adjustments to mortality, disability, turnover and retirement rate tables, such as age setbacks and set forwards, select and ultimate tables, projection scales and generation adjustments.

Life annuities, including life annuities with a term certain.

Population theory, including complete and curtate expectation of life, central death rates, stationary population, and average ages in a stationary population.

Multiple life functions, probabilities and annuities.

Multiple decrement functions, including associated single decrement tables, probabilities of decrement and the construction of multiple decrement tables from associated single decrement tables.

Principles of actuarial equivalence and related calculations.

One-year term costs for ancillary benefits.

Life insurance, including basic forms, single and annual premiums, varying insurance, and insurance and annuity relationships.

## **SUGGESTED READINGS FOR EA-1**

The Advisory Committee on Actuarial Examinations believes that most (if not all) of the topics in the syllabus are covered in one or more of the following sources. There is a great deal of overlap among the following references. Candidates do not need to use them all. The references listed below are to identify available resources from which the candidate may select. This list is not meant to describe or modify the syllabus listed above.

Bowers, N.L. et. al., *Actuarial Mathematics*, (Second Edition–1997) (excluding Chapters 1, 2, 12, 13, 14, and 15); Society of Actuaries, 475 N. Martingale Road, Suite 600, Schaumburg, IL 60173-2226.

Brown, R.L., *Introduction to Mathematics of Demography*, (Third Edition–1997), Chapters 3-5; ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Broverman, S.A., *Mathematics of Investment and Credit*, (Sixth Edition–2015); ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Camilli, S., Herzog, T.N, London, R.L., *Models for Quantifying Risk*, Chapters (Sixth Edition, 2015); ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Jordan, C.W., *Life Contingencies*, (Second Edition–1967, Second Printing 2003); Society Of Actuaries, 475 N. Martingale Road, Suite 600, Schaumburg, IL 60173-2226

Kellison, S.G., *The Theory of Interest*, (Third Edition–2008); McGraw-Hill, 6350 Crested Butte Circle, Colorado Springs, CO 80919

London, D., *Survival Models and Their Estimation*, (Third Edition–1997), Chapters 1, 3-6, 8-9; ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Parmenter, M.M., *The Theory of Interest and Life Contingencies with Pension Applications: A Problem-Solving Approach*, (Third Edition–1999); ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Zima, P. and Brown, R.L., *Mathematics of Finance* (2001), (Fifth Edition); McGraw-Hill Ryerson Limited, 300 Water Street, Whitby, ON, L1N 9B6

[Actuarial Standard of Practice, No. 27](#), “Selection of Economic Assumptions for Measuring Pension Obligations”

[Actuarial Standard of Practice, No. 35](#), “Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations”

## **SOCIETY OF ACTUARIES STUDY MATERIAL**

The Society of Actuaries has developed various study notes for the use of students preparing for its examinations on these subjects. These study notes are revised periodically, and new study notes may be added.

[Measurement of Investment Return](#)

[Actuarially Equivalent Benefits](#)

[Commutation Functions](#)

It should be realized, however, that such material was not necessarily drawn up with the particular nature of the Joint Board examinations in mind.



## CONDITIONS GENERALLY APPLICABLE TO ALL EA-1 EXAMINATION QUESTIONS

**If applicable, the following conditions should be considered a part of the data for each question, unless otherwise stated or implied.**

- (1) The normal retirement age is 65.
- (2) Retirement pensions commence at normal retirement age and are paid monthly for life at the beginning of each month.
- (3) There are no pre-retirement death or disability benefits.
- (4) Actuarial equivalence is based on the mortality table and interest rate assumed for funding purposes.
- (5) Interest rates that are compounded more frequently than annually are expressed as nominal rates.
- (6) Where multiple lives are involved, future lifetimes are assumed to be independent of each other.
- (7) The term “gross single premium” is equivalent to “contract single premium;” the term “net single premium” is equivalent to “single benefit premium;” the term “gross annual premium” is equivalent to “annual contract premium;” the term “net annual premium” is equivalent to “annual benefit premium.”
- (8) There are no policy loans in effect.
- (9) For a bond, the face amount and the redemption value are the same.
- (10) Interest rate equals yield rate.
- (11) The term “duration” means “Macaulay duration”.

**If applicable, the preceding conditions should be considered a part of the data for each question, unless otherwise stated or implied.**

# PENSION EA-2 (SEGMENT L) EXAMINATION

## MAY 2022

The EA-2 (Segment L) examination is two-and-one-half hours in length and covers relevant pension laws (in particular the provisions of the Employee Retirement Income Security Act (ERISA) and related laws, regulations, and rulings) as they affect pension actuarial practice. The EA-2 (Segment L) examination presupposes knowledge of the topics covered in the EA-1 examination.

**Please note that certain topics are tested on both the EA-2 (Segment L) and EA-2 (Segment F) examinations. Questions on the EA-2 (Segment F) examination will focus on the effect of the law on funding requirements. Questions on the EA-2 (Segment L) examination will focus on the effect of the law on non-funding aspects.**

Questions on the Pension EA-2 (Segment L) examination may contain commutation functions. **Candidates are expected to understand and be able to use commutation functions.** Candidates who are not familiar with commutation functions may wish to read the SOA Study Note "[Commutation Functions](#)."

### SYLLABUS

Requirements with respect to vesting, service credits, employee contributions, accrued benefits, normal retirement.

Requirements with respect to and adjustments for early retirement, postponed retirement, joint and survivor annuities, optional forms of distribution, and pre-retirement death benefits.

Determination of benefits, including permitted disparity.

Maximum benefit limitations.

Determination of top-heavy status; additional requirements with respect to top-heavy plans.

Funding-based limits on benefits and benefit accruals under single-employer defined benefit plans.

Adjustable benefits and benefit restrictions under multiemployer plans in endangered or critical status.

Nondiscrimination requirements including those related to plan participation, coverage, and permitted disparity.

Requirements with respect to reporting and disclosure, including underfunded plans, reductions in future benefit accruals, and reportable events.

PBGC premium requirements.

Plan termination requirements including standard and distress terminations, involuntary terminations, missing participants, guaranteed benefits, allocation of assets, plan liability and employer liability.

Withdrawal liability under multiemployer plans.

Prohibited transactions and fiduciary standards.

Excise taxes other than for funding requirements.

Standards of performance and professional conduct for enrolled actuaries.

## **SUGGESTED READINGS FOR EA-2 (SEGMENT L)**

Pension law and IRS promulgations can be found in publications of Warren, Gorham & Lamont, Commerce Clearing House, Maxwell Macmillan, Research Institute of America, and similar organizations. This list is not meant to describe or modify the syllabus listed above.

### **TITLE I OF THE EMPLOYEE RETIREMENT INCOME SECURITY ACT OF 1974, ALL AS AMENDED THROUGH NOVEMBER 30, 2021**

- 3 Definitions (excluding (1), (32), (33), (36), (37)(E)-(G), (40), (43) and (44))
- 101 Duty of Disclosure and Reporting (excluding subsections (g), (h), (i), (m), and (n))
- 102 Contents of summary plan description (SPD)
- 103 Contents of annual report (Form 5500)
- 104 Furnishing annual report and SPD
- 105 Pension benefit statements (excluding subsections (a)(1)(A), (a)(2)(B), (a)(2)(C), and (a)(2)(D))
- 107 Retention of Records
- 209 Recordkeeping and reporting requirements
- 403 Establishment of trust
- 404 Fiduciary duties (excluding subsections (c) and (e))
- 406 Prohibited transactions
- 408 Exemptions from prohibited transactions
- 502(c) Civil penalties (but only subsections (c)(1) – (4), (6) and (8))

Title IV of Employee Retirement Income Security Act of 1974 (ERISA), as amended through November 30, 2021.

PBGC Comprehensive Premium Filing Instructions for 2021 Plan Years

Current IRS Form 5330, including instructions

- Line 3 / Schedule C – Tax on prohibited transactions (Sections 4975(a) and (b))
- Line 14 / Schedule I – Tax on reversion of qualified plan assets to an employer (Section 4980)
- Line 15 / Schedule J – Tax on failure to provide notice of significant reduction in future accruals (Section 4980F)

### **INTERNAL REVENUE CODE SECTIONS, ALL AS AMENDED THROUGH NOVEMBER 30, 2021**

- 318 Constructive Ownership of Stock
- 401 Qualified Plans – definition (excluding subsections (f),(g),(i),(m),(n), and (p))
- 410 Minimum Participation Standards (excluding subsections (c) and (d))
- 411 Minimum Vesting Standards (excluding subsection (e))
- 413 Collectively Bargained Plans, etc.
- 414 Definitions and Special Rules – controlled group, multiemployer, mergers, HCE, SLOB, compensation (excluding subsections (d), (e), (u), and (w))
- 415 Limitations on benefits & contributions (excluding subsections (m) and (n))
- 416 Top heavy rules
- 417 Minimum Survivor Annuity Requirements
- 420 Transfers of excess pension assets to retiree health or applicable life insurance accounts
- 432(a) General rules
- 432(c)(1) Funding improvement plan for multiemployer plans in endangered status
- 432(d) Rules of operation during adoption and improvement periods

- 432(e) Rehabilitation plans for multiemployer plans in critical status (including only subsections (1), (3)(A), (6), (8)(A), (8)(B), and (9)(A))
- 432(f) Rules of operation during adoption and rehabilitation period
- 436 Funding based limits on benefits and benefit accruals under single employer defined benefit plans
- 1563 Definitions and Special Rules
- 4974 Excise Tax on Certain Accumulations in Qualified Retirement Plans
- 4975 Tax on Prohibited Transactions
- 4980 Tax on Reversion of Qualified Plan Assets to Employer
- 4980F Failure of Applicable Plans Reducing Benefit Accruals to Satisfy Notice Requirements
- 6057 Annual Registration
- 6058 Information Required in Connection with Certain Plans of Deferred Compensation
- 6059 Periodic Report of Actuary

Joint Board regulations (20 CFR Part 901.20) governing the performance of actuarial services under ERISA

Treasury Department Circular No. 230 (31 CFR Part 10) Section 10.3

## **IRS PROMULGATIONS**

### **REGULATIONS**

- 1.401(a)-1 Normal retirement age
- 1.401(a)(4) Nondiscrimination requirements
- 1.401(a)(9) Minimum Distribution (-1, -2, -3, -6 except Q&A-12 and Q&A -16)
- 1.401(a)(26) Minimum participation requirements
- 1.401(I) Permitted disparity
- 1.410(b) Minimum coverage requirements
- 1.411(a)(13)-1 Hybrid plans
- 1.411(b)(5)-1 Reduction in rate of benefit accrual under a defined benefit plan (excluding 1.411(b)(5)-1(e)(3)(vi), Transitional amendments needed to satisfy the market rate of return rules)
- 1.411(d)-2 Nonforfeitability of benefits, termination or partial termination of a plan
- 1.411(d)-3 Section 411(d)(6) protected benefits
- 1.411(d)-4 Section 411(d)(6) protected benefits
- 1.414(q)-1T Highly compensated employees
- 1.414(s)-1 Definition of Compensation
- 1.415(a)-1 General rules with respect to limitations on benefits and compensations under qualified plans
- 1.415(b)-1 Limitations for defined benefit plans
- 1.415(c)-1 Limitations for defined contribution plans
- 1.415(c)-2 Compensation
- 1.415(d)-1 Cost of living adjustments
- 1.415(f)-1 Aggregating plans
- 1.415(g)-1 Disqualification of plans and trusts
- 1.415(j)-1 Limitation year
- 1.416-1 Questions and answers to top-heavy plans
- 1.417(a)(3)-1 Required explanation of qualified joint and survivor annuity and qualified preretirement survivor annuity
- 1.436-1(a) Limits on benefits and benefit accruals under single employer defined benefit plans -- General rules
- 1.436-1(b) Limitation on shutdown benefits and other unpredictable contingent event benefits
- 1.436-1(c) Limitations on plan amendments increasing liability for benefits
- 1.436-1(d) Limitation on prohibited payments
- 1.436-1(e) Limitation on benefit accruals for plans with severe funding shortfalls
- 1.436-1(f) Methods to avoid or terminate benefit limitations
- 1.436-1(g) Rules of operation for periods prior to and after certification
- 1.436-1(h) Presumed underfunding for purposes of benefit limitations
- 1.436-1(j) Definitions

54.4980F-1	Final regulations implementing section 659 of EGTRRA
301.6057-1	Employee retirement benefit plans; identification of participant with deferred vested retirement benefit
301.6057-2	Employee retirement benefit plans; notification of change in plan status
301.6058-1	Information required in connection with certain plans of deferred compensation
301.6059-1	Periodic report of actuary

## **REVENUE RULINGS**

76-259	Pension plan benefits offset by profit-sharing plan benefits
81-11	Minimum accrued benefits; fractional rule; break-in service
81-140	Suspension of benefits due to reemployment
89-60	Interest rates used in determining employees' "accumulated contributions"
89-97	Distribution of assets from a terminating plan
2002-42	Partial termination merger or conversion of money purchase plan: IRC section 4980F notice and 204(h) of ERISA
2002-43	General rules relating to excise tax on prohibited transactions
2003-65	Vesting service upon resumption of accruals
2003-85	Application of IRC section 4980 excise tax
2007-43	Partial termination, turnover
2012-4	Rollover from qualified defined contribution plan to qualified defined benefit plan to obtain additional annuity
2013-17	Effect of Windsor decision on certain federal tax matters.

## **NOTICES**

97-75	Guidance relating to the amendments to the minimum distribution requirements of section 401(a)(9) of the Code made by section 1404 of the Small Business Job Protection Act of 1996, Pub. L. 104-188
2008-30	Sections III and IV – Guidance on PPA changes to IRC sections 401(a)(11) and 417
2010-15	Miscellaneous HEART Act changes
2014-19	Application of Windsor decision and Rev. Rul. 2013-17 to qualified retirement plans

## **PBGC PROMULGATIONS**

### **REGULATIONS**

4001	Terminology
4006	Premium Rates
4007	Payment of Premiums
4010	Annual Financial and Actuarial Information Reporting
4022	Benefits Payable in Terminated Single-Employer Plans
4041	Termination of Single-Employer Plans
4043	Reportable Events and Certain other Notification Requirements
4044	Allocation of Assets in Single-Employer Plans
4050	Missing Participants
4062	Liability for Termination of Single-Employer Plans
4211	Allocating Unfunded Vested Benefits to Withdrawing Employers
4219	Notice, Collection, and Redetermination of Withdrawal Liability

## **DOL PROMULGATIONS**

### **REGULATIONS**

#### DEFINITIONS

- 2510.3-2 Definition of pension plans
- 2510.3-21 Definition of fiduciary

#### REPORTING AND DISCLOSURE

- 2520.101-5 Annual funding notice for defined benefit plans
- 2520.101-6 Multiemployer pension plan information made available on request
- 2520.102-2 Style and format of summary plan description
- 2520.102-3 Contents of summary plan description
- 2520.103-1 Contents of the annual report
- 2520.103-10 Annual report financial schedules
- 2520.104-42 Waiver of certain actuarial information in the annual report
- 2520.104-46 Waiver of examination and report of an independent qualified public accountant for employee benefit plans with fewer than 100 participants
- 2520.104a-5 Annual report filing requirements
- 2520.104b-2 Summary plan description
- 2520.104b-3 Summary of material modifications to the plan and changes in the information required to be included in the SPD
- 2520.107-1 Use of electronic media for maintenance and retention of records

#### PARTICIPATION AND VESTING

- 2530.203-3 Suspension of pension benefits upon reemployment of retirees

#### FIDUCIARY RESPONSIBILITY

- 2550.403a-1 Establishment of trust
- 2550.403b-1 Exemptions from trust requirement
- 2550.404a-4 Selection of annuity providers – safe harbor for individual account plans
- 2550.408b-2 General statutory exemption for services or office space
- 2550.408c-2 Compensation for services

#### ADMINISTRATION AND ENFORCEMENT

- 86 FR 2964,  
2971-2973 Federal Civil Penalties Inflation Adjustment Act Catch-Up Adjustments for ERISA penalties under the Title I sections listed above (see the final regulation in the Federal Register for 29 CFR 2575.1 through .3)

### **INTERPRETIVE BULLETINS**

- 2509.75-2 Prohibited Transactions
- 2509.75-4 Indemnification of fiduciaries
- 2509.75-5 & 2509.75-8 Questions and answers relating to fiduciary responsibility
- 2509.75-6 Section 408(c)(2) of ERISA
- 2509.75-9 Guidelines on independence of accountant retained by employee benefit plan
- 2509.95-1 [Fiduciary standard under ERISA when selecting an annuity provider for a defined benefit pension plan](#)

## **FIELD ASSISTANCE BULLETINS**

- 2013-01      ERISA's Annual Funding Notice Requirements Following the Moving Ahead for Progress in the 21st Century Act
- 2015-01      ERISA's Annual Funding Notice Requirements Following the Highway and Transportation Funding Act of 2014

## **SOCIETY OF ACTUARIES STUDY MATERIAL**

The Society of Actuaries has developed various study notes for the use of students preparing for its examinations on these subjects. These study notes are revised periodically, and new study notes may be added.

[Pension Plan Terminations](#)

[Contributory Pension Plans after OBRA '89](#)

[Tax Forms](#)

[Summary of Economic Growth and Tax Relief Reconciliation Act of 2001 \(EGTRRA\) Provisions Relating to Pension and Profit-Sharing Plans](#)

[Penalty Taxes under the U.S. Internal Revenue Code](#)

[Commutation Functions](#)

It should be realized, however, that such material was not necessarily drawn up with the particular nature of the Joint Board examinations in mind.

The Society of Actuaries also suggests the following text:

McGinn, Daniel F., *Multi-employer Retirement Plans: Handbook for the 21<sup>st</sup> Century (2003)*; International Foundation of Employee Benefits; P.O. Box 69, Brookfield, WI 53008

## **AMERICAN SOCIETY OF PENSION PROFESSIONALS AND ACTUARIES STUDY MATERIAL**

The American Society of Pension Professionals and Actuaries (ASPPA) suggest the following books. These books, while not designed specifically for the examination, cover much of the syllabus and more.

McGhie, G. N., *The Defined Benefit Answer Book* (Current Edition), Aspen Publishers; 7201 McKinney Circle; P.O. Box 990; Frederick, MD 21701

Tripodi, Sal L., *The ERISA Outline Book*, (Current Edition)

The ERISA Outline Book is available from [ASPPA](#).

## **CONDITIONS GENERALLY APPLICABLE TO ALL EA-2 (SEGMENT L) EXAMINATION QUESTIONS**

**If applicable, the following conditions should be considered a part of the data for each question, unless otherwise stated or implied.**

**For purposes of this examination, IRS, Treasury and PBGC releases granting disaster relief should be ignored.**

### **GENERAL CONDITIONS REGARDING PLAN PROVISIONS**

- (1) “Plan” or “pension plan” means a defined benefit pension plan.
- (2) The plan is qualified under IRC section 401. Thus, for example, any benefit formulas should be understood to be limited by other plan provisions required by the Code.
- (3) The normal retirement age is 65.
- (4) Retirement pensions commence at normal retirement age and are paid monthly for the life of the retiree at the beginning of each month.
- (5) The plan covers all active employees of the employer; there is no age or service requirement for participation. Thus, when referring to active employees, the terms “employee” and “participant” are synonymous.
- (6) There are no, and never have been any, mandatory or voluntary employee contributions.
- (7) Service for purposes of vesting and benefit accrual is credited on the basis of time elapsed since date of hire.
- (8) When the normal retirement benefit is computed as a dollar amount, or as a percentage of compensation, for each year of service, the accrued benefit is defined likewise.
- (9) Actuarial equivalence is based on the mortality table and interest rate assumed for funding purposes.
- (10) Qualified joint and survivor annuities, qualified pre-retirement survivor annuities, and any other specified forms of payment are provided in such manner that they result in no cost to the employer.
- (11) The plan has not been amended since its effective date.
- (12) The adoption date of any plan or amendment is the same as its effective date.
- (13) The terms “applicable mortality (table)” and “applicable interest (rate)” are as defined in IRC section 417(e)(3).
- (14) The plan is not an applicable defined benefit plan described in IRC section 411(a)(13)(C) unless otherwise stated.



## **GENERAL CONDITIONS REGARDING FUNDING**

- (15) Any actuarial valuation encompasses not only all active employees but also retired employees, beneficiaries, alternate payees, and former employees entitled to vested deferred pensions.
- (16) The terms “value of plan assets,” “actuarial value of assets,” and “market value of assets” mean the values developed for purposes of IRC section 412, 430, and 431 before being adjusted for items such as the existing credit balance, funding standard carryover balance, prefunding balance, or the outstanding balances of certain bases.
- (17) All actuarial assumptions are deemed “reasonable” and meet the “best estimate” criterion.
- (18) For a statutory hybrid (cash balance) plan, hypothetical accounts are assumed to be calculated in the following manner:
  - Pay credits are added annually to the hypothetical accounts at the end of the plan year.
  - Interest credits are added annually to the hypothetical accounts at the end of the plan year.
  - Interest credits are calculated using the hypothetical accounts as of the beginning of the plan year.

The values of the hypothetical accounts at the beginning of a plan year are equal to the values of the hypothetical accounts at the end of the prior plan year.

## **GENERAL CONDITIONS REGARDING NONDISCRIMINATION TESTING**

- (19) For purposes of nondiscrimination testing under IRC section 401(a)(4), grouping of allocation rates or accrual rates has not been used.
- (20) For purposes of coverage testing under IRC section 410(b), “snapshot” testing is not used and permitted disparity is not imputed.

## **GENERAL CONDITIONS REGARDING BENEFIT RESTRICTIONS**

- (21) AFTAPs have been certified on a timely basis.
- (22) The plan has provisions for automatically restoring accruals ceased due to the application of IRC section 436, to the extent permitted by regulations, and the plan’s actuary has provided the required certification to permit such restoration.

## **MISCELLANEOUS GENERAL CONDITIONS**

- (23) All plan provisions and funding comply with all temporary and final regulations under the Internal Revenue Code and ERISA, as amended through November 30, 2021, and proposed regulations as listed in the Suggested Readings.
- (24) The plan is sponsored by a single employer; the sponsoring employer is a taxable entity and is not a member of a controlled group.
- (25) The plan is not established or maintained in connection with a collectively bargained agreement.

- (26) Employees subject to a collective bargaining agreement are non-professional. If employees covered by a collective bargaining agreement are covered by the plan, their coverage is pursuant to that collective bargaining agreement.
- (27) The plan year, the employer's limitation year, and the employer's tax year are all the calendar year.
- (28) The employer has never maintained a defined contribution plan or another defined benefit plan. No employee has been covered by a defined contribution or defined benefit plan that is required to be aggregated with his employer's plans for purposes of IRC section 415.
- (29) Where IRC section 401(a)(17) applies, compensation does not exceed these limits unless sufficient information to apply the limits is provided.
- (30) Benefits do not exceed IRC section 415 limits unless sufficient information to apply these limits is provided.
- (31) The plan is covered by the PBGC.
- (32) All union plans are collectively bargained and all union employees are subject to collective bargaining.
- (33) The plan sponsor is not now, and never has been, in bankruptcy.
- (34) The PBGC has determined that a terminated plan was terminated for a legitimate business purpose.
- (35) References to law and regulation section numbers are for clarity and can be assumed to be correct.
- (36) Even if not so, assume all due dates are NOT Saturdays, Sundays, or holidays.
- (37) Disregard any industry-specific rules. Furthermore, plans are not eligible for PPA delayed effective dates (PPA sections 104-106).
- (38) The plan has not been top-heavy in any year.
- (39) A multiemployer plan has never applied for approval to suspend benefits as provided in IRC section 432(e)(9).
- (40) A multiemployer plan is not in "Endangered Status", "Seriously Endangered Status", "Critical Status", or "Critical and Declining Status" for the plan year or any prior plan year unless sufficient information to determine the status is provided.
- (41) A multiemployer plan has never applied for approval to receive a special financial assistance from the PBGC as provided in IRC section 432(k) and ERISA section 4262.

**If applicable, the preceding conditions should be considered a part of the data for each question, unless otherwise stated or implied.**

**LIMITS AND TABLES**  
**(Included with the 2022 EA-2 (Segment L) examination)**

<b>Compensation Limit IRC section 401(a)(17)</b>	
<u>Year</u>	<u>Limit</u>
2009-2011	245,000
2012	250,000
2013	255,000
2014	260,000
2015-2016	265,000
2017	270,000
2018	275,000
2019	280,000
2020	285,000
2021	290,000
2022	305,000

<b>Maximum Benefit Limit IRC section 415(b)</b>	
2009-2011	195,000
2012	200,000
2013	205,000
2014-2016	210,000
2017	215,000
2018	220,000
2019	225,000
2020-2021	230,000
2022	245,000

<b>Nondiscriminatory Classification Test IRC section 410(b)</b>			
Nonhighly compensated employee			
concentration <u>percentage</u>	Safe harbor <u>percentage</u>	Unsafe harbor <u>percentage</u>	
0-60	50.00	40.00	
61	49.25	39.25	
62	48.50	38.50	
63	47.75	37.75	
64	47.00	37.00	
65	46.25	36.25	
66	45.50	35.50	
67	44.75	34.75	
68	44.00	34.00	
69	43.25	33.25	
70	42.50	32.50	
71	41.75	31.75	
72	41.00	31.00	
73	40.25	30.25	
74	39.50	29.50	
75	38.75	28.75	
76	38.00	28.00	
77	37.25	27.25	
78	36.50	26.50	
79	35.75	25.75	
80	35.00	25.00	
81	34.25	24.25	
82	33.50	23.50	
83	32.75	22.75	
84	32.00	22.00	
85	31.25	21.25	
86	30.50	20.50	
87	29.75	20.00	
88	29.00	20.00	
89	28.25	20.00	
90	27.50	20.00	
91	26.75	20.00	
92	26.00	20.00	
93	25.25	20.00	
94	24.50	20.00	
95	23.75	20.00	
96	23.00	20.00	
97	22.25	20.00	
98	21.50	20.00	
99	20.75	20.00	

<b>Permitted Disparity Tables IRC section 401(l)</b>				
Annual factor in maximum excess allowance and maximum offset allowance percent				
<u>Age at benefit Commencement</u>	<u>SSRA 65</u>	<u>SSRA 66</u>	<u>SSRA 67</u>	<u>Simplified Table</u>
70	1.209	1.101	1.002	1.048
69	1.096	0.998	0.908	0.950
68	0.996	0.907	0.825	0.863
67	0.905	0.824	0.750	0.784
66	0.824	0.750	0.700	0.714
65	0.750	0.700	0.650	0.650
64	0.700	0.650	0.600	0.607
63	0.650	0.600	0.550	0.563
62	0.600	0.550	0.500	0.520
61	0.550	0.500	0.475	0.477
60	0.500	0.475	0.450	0.433
59	0.475	0.450	0.425	0.412
58	0.450	0.425	0.400	0.390
57	0.425	0.400	0.375	0.368
56	0.400	0.375	0.344	0.347
55	0.375	0.344	0.316	0.325

<b>FICA Taxable Wage Base</b>	
<u>Year</u>	<u>Limit</u>
2009-2011	106,800
2012	110,100
2013	113,700
2014	117,000
2015-2016	118,500
2017	127,200
2018	128,400
2019	132,900
2020	137,700
2021	142,800
2022	147,000

<b>Key Employee Compensation IRC section 416</b>		
<u>Year</u>	<u>Officer</u>	<u>1% owner</u>
2009-2011	160,000	150,000
2012-2013	165,000	150,000
2014-2016	170,000	150,000
2017-2018	175,000	150,000
2019	180,000	150,000
2020-2021	185,000	150,000
2022	200,000	150,000

<b>Highly Compensated Employee Compensation IRC section 414(q)</b>	
<u>Year</u>	<u>Limit</u>
2009-2011	110,000
2012-2014	115,000
2015-2018	120,000
2019	125,000
2020-2021	130,000
2022	135,000

<b>Maximum PBGC Guaranteed Life-Only Annuity at Age 65</b>	
<u>Year</u>	<u>Monthly Benefit</u>
2009-2011	4,500.00
2012	4,653.41
2013	4,789.77
2014	4,943.18
2015-2016	5,011.36
2017	5,369.32
2018	5,420.45
2019	5,607.95
2020	5,812.50
2021	6,034.09
2022	6,204.55

**FACTORS USED TO ADJUST MAXIMUM PBGC GUARANTEED BENEFITS  
FOR PAYMENTS OTHER THAN AS A SINGLE LIFE ANNUITY AT AGE 65**

<b>Commencement Age</b>	
<u>Age</u>	<u>Factor</u>
75	3.04
74	2.76
73	2.48
72	2.21
71	1.93
70	1.66
69	1.49
68	1.34
67	1.21
66	1.10
65	1.00
64	0.93
63	0.86
62	0.79
61	0.72
60	0.65
59	0.61
58	0.57
57	0.53
56	0.49
55	0.45
54	0.43
53	0.41
52	0.39
51	0.37
50	0.35
49	0.33
48	0.31
47	0.29
46	0.27
45	0.25

<b>Form of Payment Certain &amp; Life*</b>	
<u>Years</u>	<u>Factor</u>
1	0.995
2	0.990
3	0.985
4	0.980
5	0.975
6	0.965
7	0.955
8	0.945
9	0.935
10	0.925

\*Reduction decreases by  
0.01 per year in excess of 10.

<b>Form of Payment Joint &amp; Contingent (J&amp;C)</b>		
with 10 yr		
<u>Percent</u>	<u>Factor</u>	<u>Certain</u>
50%	0.900	× 0.960
66 2/3 %	0.867	× 0.970
75%	0.850	× 0.975
100%	0.800	× 0.990

<b>Form of Payment Joint &amp; Survivor (J&amp;S)</b>	
<u>Percent</u>	<u>Factor</u>
50%	1.00
66 2/3 %	0.93
75%	0.90
100%	0.80

<b>Age Difference For J&amp;S and J&amp;C Beneficiary</b>		
<u>Difference</u>	<u>Younger</u>	<u>Older</u>
1	0.99	1.005
2	0.98	1.010
3	0.97	1.015
4	0.96	1.020
5	0.95	1.025
6	0.94	1.030
7	0.93	1.035
8	0.92	1.040
9	0.91	1.045
10	0.90	1.050

<b>PBGC Premium Rates</b>				
Plan Years Beginning in:	<b>Single Employer Plans</b>			<b>Multiemployer Plans</b>
	Per Participant Rate for Flat-rate Premium	<b>Variable-Rate Premium</b>		
		Rate per \$1,000 UVBs	Per Participant Cap	Per Participant Rate for Flat-rate Premium
2011	\$35	\$9	N/A	\$9
2012	\$35	\$9	N/A	\$9
2013	\$42	\$9	\$400	\$12
2014	\$49	\$14	\$412	\$12
2015	\$57	\$24	\$418	\$26
2016	\$64	\$30	\$500	\$27
2017	\$69	\$34	\$517	\$28
2018	\$74	\$38	\$523	\$28
2019	\$80	\$43	\$541	\$29
2020	\$83	\$45	\$561	\$30
2021	\$86	\$46	\$582	\$31
2022	\$88	\$48	\$598	\$32

# PENSION EA-2 (SEGMENT F) EXAMINATION

## NOVEMBER 2021

The EA-2 (Segment F) examination is four hours in length and covers the calculation of minimum required contributions and deductible limits under current pension law for both single-employer and multiemployer plans, along with related topics including actuarial mathematics, assumption selection, and excise taxes.

**Please note that EA-2 (Segment F) presupposes knowledge of the topics covered in the EA-1 examination and in the EA-2 (Segment L) examination. Therefore, a candidate taking the EA-2 (Segment F) examination is responsible for all topics covered on the EA-2 (Segment L) examination, even if a particular topic does not appear in the syllabus or the reading list for EA-2 (Segment F). Questions on the EA-2 (Segment F) examination will focus on the effect of the law on funding requirements. Questions on the EA-2 (Segment L) examination will focus on the effect of the law on non-funding aspects.**

Questions on the Pension EA-2 (Segment F) examination may contain commutation functions. **Candidates are expected to understand and be able to use commutation functions.** Candidates who are not familiar with commutation functions may wish to read the SOA Study Note "[Commutation Functions](#)".

### SYLLABUS

Actuarial cost methods, including unit credit, projected unit credit, entry age normal, individual level premium, aggregate, individual aggregate, attained age normal, frozen initial liability, shortfall, one-year term, and variations thereof.

Determination of the actuarial (i.e. smoothed) value of assets.

Valuation of ancillary benefits.

Selection of assumptions.

Valuation techniques for handling employee contributions.

Effect on valuation results of various patterns of experience, including experience with respect to investment earnings, changes in asset value, mortality, disability, employee turnover, changes in compensation, retirement, choice of retirement options, and Social Security.

Effect on valuation results of changes in plan provisions, actuarial cost methods, asset valuation methods, and actuarial assumptions.

Minimum funding requirements including, but not limited to:

For single employer plans (including multiple employer plans), determination of the minimum required contribution, including calculation of funding target and target normal cost, at-risk provisions, transition rules, effects of IRC section 436 on plan funding, interest stabilization provisions, funding balance(s), and waivers of minimum required contributions.

For multiemployer plans, the basics of the minimum funding standards including those for plans in critical, endangered, or critical and declining status, amortization periods, credit balance, funding standard account, amortization period extensions, and waivers of funding deficiencies.

Required quarterly contributions and liquidity shortfall.

Deductible limits for federal income tax purposes.

Penalty taxes for failures to meet minimum funding standards.

## **SUGGESTED READINGS FOR EA-2 (SEGMENT F)**

The Advisory Committee on Actuarial Examinations believes that most (if not all) of the topics in the syllabus are covered in one or more of the following sources. There is a great deal of overlap among the books listed below. Candidates do not need to use them all. The references listed below are to identify available resources from which the candidate may select. This list is not meant to describe or modify the syllabus listed above. Pension law and IRS promulgations can be found in publications of Warren, Gorham & Lamont, Commerce Clearing House, Maxwell Macmillan, Research Institute of America, and similar organizations.

**Please note that EA-2 (Segment F) presupposes knowledge of the topics covered in the EA-1 examination and in the EA-2 (Segment L) examination. Therefore, a candidate taking the EA-2 (Segment F) examination is responsible for all topics covered on the EA-2 (Segment L) examination, even if a particular topic does not appear in the syllabus or the reading list for EA-2 (Segment F).**

Aitken, W.H., *A Problem-Solving Approach to Pension Funding and Valuation*, (2<sup>nd</sup> Edition–1996); ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Anderson, A.W., *Pension Mathematics for Actuaries*, (3<sup>rd</sup> Edition–2006); ACTEX Publications, P.O. Box 974, Winsted, CT 06098

Berin, B. N., *Fundamentals of Pension Mathematics*, (1989); Society of Actuaries, 475 N. Martingale Road, Suite 600, Schaumburg, IL 60173-2226

Farrimond, W., Mayer, D., Farber, D., and Matray, G., *Actuarial Cost Methods, A Review (3<sup>rd</sup> Edition–1999)*; <https://www.asppa.org/news-resources/researchwhite-papers/actuarial-cost-methods-review-3rd-edition-1999>

[Actuarial Standard of Practice No. 4](#), “Measuring Pension Obligations and Determining Pension Plan Cost or Contributions”

[Actuarial Standard of Practice No. 27](#), “Selection of Economic Assumptions for Measuring Pension Obligations”

[Actuarial Standard of Practice No. 35](#), “Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations”

[Actuarial Standard of Practice No. 51](#), “Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions”

Employee Retirement Income Security Act of 1974 (ERISA) sections 206(g), 302, 303, 304, and 305, as amended through May 31, 2021

Current Schedules SB and MB of Form 5500, including instructions



Current IRS Form 5330, including instructions

- Line 1 / Schedule A – Tax on nondeductible contributions (Section 4972)
- Line 8 / Schedule D – Tax on failure to meet minimum funding standards (Sections 4971(a) and (b))
- Line 9 / Schedule E – Tax on failure to pay liquidity shortfall (Sections 4971(f)(1) and (2))
- Line 10 / Schedule F – Tax on multiemployer plans in endangered or critical status (Sections 4971(g)(2), (3) and (4))

#### **INTERNAL REVENUE CODE SECTIONS, AS AMENDED THROUGH MAY 31, 2022**

404	Deductible employer contributions to a deferred-payment plan
412	Minimum funding standards
413	Collectively bargained plans, etc.
414(l)	Mergers and consolidations of plans or transfers of plan assets
417(e)	Restrictions on cash outs
430	Minimum funding requirements for single-employer defined benefit pension plans
431	Minimum funding requirements for multiemployer defined benefit plans
432	Additional funding rules for multiemployer plans in endangered status or critical status
436	Funding-based limits on benefits and benefit accruals under single-employer defined benefit plans
4971	Taxes on failure to meet minimum funding standards
4972	Tax on nondeductible contributions to qualified employer plans
6059	Periodic report of actuary

#### **REGULATIONS**

1.401(a)(2)-1	Refund of mistaken contributions and withdrawal liability payments to multiemployer plans
1.404(a)-14	Special rules in connection with ERISA – Deductible Limits
11.412(c)-12	Extension of time to make contributions
1.412(c)(1)-1	Determinations to be made under funding method
1.412(c)(1)-2	Shortfall method
1.412(c)(2)-1	Valuation of plan assets; reasonable actuarial methods
1.412(c)(3)-1	Reasonable funding methods
1.414(l)-1	Mergers and consolidations of plans or transfers of plan assets
1.417(e)-1	Restrictions and valuations of distributions from plans subject to sections 401(a)(11) and 417
1.430(a)-1	Determination of minimum required contribution
1.430(d)-1	Determination of target normal cost and funding target
1.430(f)-1	Effect of prefunding balance and funding standard carryover balance
1.430(g)-1	Valuation date and valuation of plan assets
1.430(h)(2)-1	Interest rates used to determine present value
1.430(h)(3)-1	Mortality tables used to determine present value
1.430(h)(3)-2	Substitute mortality tables (sections (a), (c)(1) and (c)(6) only)
1.430(i)-1	Special rules for plans in at-risk status
1.430(j)-1	Payment of minimum required contributions
1.431(c)(6)-1	Mortality tables used to determine current liability
1.436-1(a)	General rules
1.436-1(f)	Methods to avoid or terminate benefit limitations
1.436-1(j)	Definitions
301.6059-1	Periodic report of actuary
54.4971(c)-1	Taxes on failure to meet minimum funding standards

## **PROPOSED REGULATIONS**

- 1.432(a)-1 General rules relating to section 432
- 1.432(b)-1 Determination of status and adoption of a plan

## **REVENUE RULINGS**

- 77-2 Change in benefit structure after valuation date
- 78-48 Assumptions & methods specified in plan
- 78-331 Assumption that employees retire at normal retirement date
- 79-237 Terminating plan – funding standard account and penalty taxes
- 80-315 Supplementary benefits
- 81-136 Election to receive benefits less than plan provides
- 81-137 Separate funding account for separate plans
- 81-195 Effect of 415 limits on minimum and maximum contribution levels, and inability to project future increases in limits for funding purposes
- 81-213 Experience gains & losses, amortizations
- 81-214 Interest charges in funding standard account
- 81-215 Effect of 415 limits after valuation date but within plan year
- 82-125 Full funding limitation and deductible limit
- 85-131 Reasonable allocation of past and future liabilities under unit credit method when 415 limit is involved
- 86-48 Determining “Benefits on a Termination Basis” for the purpose of a spin-off. (i.e. early retirement benefits, optional forms, ...)
- 2001-51 Limitations on benefits and contributions under qualified plans
- 2003-83 Entry age normal funding method
- 2007-67 Calculation of minimum present value under IRC section 417(e)(3)

## **NOTICES**

- 2009-22 Asset valuation methods for single employer defined benefit plans under WRERA
- 2010-83 Funding relief for multiemployer defined benefit plans under PRA 2010
- 2012-61 Guidance on pension stabilization under the Moving Ahead for Progress in the 21st Century Act (MAP-21), Exclude sections III.H, T and E
- 2020-85 Updated mortality improvement rates and static mortality tables for defined benefit pension plans for 2022.
- 2021-48 Guidance on Single-Employer Defined Benefit Pension Plan Funding Changes under the American Rescue Plan Act of 2021
- 2021-57 Funding relief for multiemployer defined benefit pension plans under the American Rescue Plan Act of 2021

## **REVENUE PROCEDURES**

- 87-27 Plan year changes
- 90-49 Recovery of excess contributions
- 2000-40 Automatic approval for change of funding method (plans not subject to IRC section 430, as modified by Rev. Proc. 2017-56)
- 2017-56 Automatic approval for change of funding method (plans subject to IRC section 430)
- 2017-57 Changes in funding method

## **SOCIETY OF ACTUARIES STUDY MATERIAL**

The Society of Actuaries has developed various study notes for the use of students preparing for its examinations on these subjects. These study notes are revised periodically, and new study notes may be added.

[Excerpt on Plan Qualification](#)

[Assessment and Selection of Actuarial Assumptions for Measuring Pension Obligations](#)

[Penalty Taxes Under the U.S. Internal Revenue Code](#)

[Commutation Functions](#)

It should be realized, however, that such material was not necessarily drawn up with the particular nature of the Joint Board examinations in mind.

The Society of Actuaries also suggests the following text:

McGinn, Daniel F., *Multi-employer Retirement Plans: Handbook for the 21<sup>st</sup> Century (2003)*; International Foundation of Employee Benefits; P.O. Box 69, Brookfield, WI 53008

## **AMERICAN SOCIETY OF PENSION PROFESSIONALS AND ACTUARIES STUDY MATERIAL**

The American Society of Pension Professionals and Actuaries (ASPPA) suggests the following books. These books, while not designed specifically for the examination, cover much of the syllabus and more.

McGhie, G. N., *The Defined Benefit Answer Book* (Current Edition), Aspen Publishers; 7201 McKinney Circle; P.O. Box 990; Frederick, MD 21701

Tripodi, Sal L., *The ERISA Outline Book*, (Current Edition)

The ERISA Outline Book is available from [ASPPA](#).

## **CONDITIONS GENERALLY APPLICABLE TO ALL EA-2 (SEGMENT F) EXAMINATION QUESTIONS**

**If applicable, the following conditions should be considered a part of the data for each question, unless otherwise stated or implied.**

**For purposes of this examination, IRS, Treasury and PBGC releases granting disaster relief should be ignored.**

### **TEMPORARY GENERAL CONDITIONS**

- (A) For multiemployer plans, assume none of the elections to effectuate the provisions of the American Rescue Plan Act of 2021 (ARPA) were made. Assume the multiemployer plan did not apply for special financial assistance under ARPA.
- (B) For single employer plans, unless otherwise stated or implied in the question, assume the plan sponsor did not make an election to apply the 15-year amortization period under ARPA to plan years beginning before 2022.
- (C) For single employer plans, unless otherwise stated or implied in the questions, assume the plan sponsor did make an election to defer the changes to the segment rates under ARPA for all purposes to the plan year beginning in 2022.

### **GENERAL CONDITIONS REGARDING PLAN PROVISIONS**

- (1) “Plan” or “pension plan” means a defined benefit pension plan.
- (2) The plan is qualified under IRC section 401. Thus, for example, any benefit formulas should be understood to be limited by other plan provisions required by the Code.
- (3) The normal retirement age is 65.
- (4) Retirement pensions commence at normal retirement age and are paid monthly for the life of the retiree at the beginning of each month.
- (5) The plan covers all active employees of the employer; there is no age or service requirement for participation. Thus, when referring to active employees, the terms “employee” and “participant” are synonymous.
- (6) There are no, and never have been any, mandatory or voluntary employee contributions.
- (7) Service for purposes of vesting and benefit accrual is credited on the basis of time elapsed since date of hire.
- (8) When the normal retirement benefit is computed as a dollar amount, or as a percentage of compensation, for each year of service, the accrued benefit is defined likewise.
- (9) Actuarial equivalence is based on the mortality table and interest rate assumed for funding purposes.
- (10) Qualified joint and survivor annuities, qualified pre-retirement survivor annuities, and any other specified forms of payment are provided in such manner that they result in no cost to the employer.
- (11) The plan has not been amended since its effective date.

- (12) The adoption date of any plan or amendment is the same as its effective date.
- (13) The terms “applicable mortality (table)” and “applicable interest (rate)” are as defined in IRC section 417(e)(3).
- (14) The plan is not an applicable defined benefit plan described in IRC section 411(a)(13)(C).

## **GENERAL CONDITIONS REGARDING FUNDING**

- (15) Any actuarial valuation includes not only all active employees but also retired employees, beneficiaries, alternate payees, and former employees entitled to vested deferred pensions.
- (16) The valuation date is the first day of the plan year; i.e., participant data, present values, asset values, etc. are as of that date. Also, normal costs and target normal costs are payable annually, the first being due on the valuation date.
- (17) The assumed retirement age is the normal retirement age.
- (18) All prior compensations are no greater than the earliest one provided.
- (19) There are no pre-retirement decrements.
- (20) All actuarial assumptions are deemed “reasonable” and meet the “best estimate” criterion.
- (21) The actuarial cost method, or funding method, is “reasonable” within the meaning of all relevant IRC sections and the regulations thereunder.
- (22) Where the normal cost under an actuarial cost method may be computed as either a level percentage of compensation or a level dollar amount, the level percentage approach is used if the plan benefits are based on compensation, and the level dollar approach is used if they are not.
- (23) Under the frozen initial liability method, whenever there is a change in the plan, actuarial assumptions, or asset valuation method, the unfunded liability is adjusted by adding to it the resulting change (positive or negative) in the unfunded entry age normal accrued liability due to the change. Likewise, under the attained age normal method, the unfunded liability is adjusted by adding to it the change in the unfunded unit credit accrued liability.
- (24) For multiemployer plans, all funding method changes after 1999 were made in accordance with Rev. Proc. 2000-40. Bases established because of funding method changes prior to 2000 are amortized over 10 years from the date established.
- (25) The unit credit funding method is as defined in Rev. Proc. 2000-40.
- (26) Ancillary benefits are funded using the same method as the retirement benefits. They are not funded on a term cost basis.
- (27) For purposes of spreading future normal costs under spread-gain methods, the present value of future compensation is not limited by IRC section 401(a)(17).
- (28) The terms “value of plan assets”, “actuarial value of assets” and “market value of assets” mean the values developed for purposes of IRC section 412, 430, and 431 before being adjusted for items such as the existing credit balance, funding standard carryover balance, prefunding balance, or the outstanding balances of certain bases.

- (29) The plan sponsor does not elect to reduce the amount of the funding standard carryover balance and/or prefunding balance pursuant to IRC section 430(f)(5) prior to the determination of the value of plan assets for the plan year or prior to the application of the balances in reducing the minimum required contribution for the plan year.
- (30) The plan sponsor elects to add the maximum amount permitted to the prefunding balance.
- (31) The plan has no funding standard carryover balance.
- (32) Where a prefunding or funding standard carryover balance exists, the plan was at least 80% funded in the prior year and is eligible to credit the balance(s) against the otherwise-applicable minimum required contribution.
- (33) If eligible, the plan sponsor elects to credit the prefunding and funding standard carryover balances against the otherwise-applicable minimum required contribution.
- (34) The actuarial cost method, asset valuation method, and actuarial assumptions have not been changed since the plan effective date except as required by PPA.
- (35) The term “**minimum required contribution**” means the smallest contribution for a plan year which will prevent a funding deficiency or unpaid minimum for that plan year, without regard to the alternative minimum funding standard account, and **before** reflecting items such as the existing credit balance, funding standard carryover balance, or prefunding balance, as applicable. Amounts to be amortized are not combined or offset against one another.
- (36) The term “**smallest amount that satisfies the minimum funding standard**” means the same as “minimum required contribution” **except** that it is determined **after** reflecting items such as the existing credit balance, funding standard carryover balance, or prefunding balance, as applicable. Amounts to be amortized are not combined or offset against one another.
- (37) No waivers of funding deficiencies or extensions of amortization periods have been granted.
- (38) The interest rate used for amortizing waivers and for extensions of amortization periods is the same as the valuation interest rate.
- (39) The employer is taxable, and all employer contributions for each prior plan year have been deducted by the employer for its tax year coincident with such plan year.
- (40) For purposes of determining the deductible limit for any year, the employer does not use (and has never used) the fresh-start alternative and does not combine (and has never combined) amortization bases.
- (41) The full funding limitation has never applied and there has been no early deemed amortization of shortfall amortization bases.
- (42) Expenses are paid directly by the employer, rather than from the assets of the plan, and therefore do not affect the funding of the plan.
- (43) Assumed compensation increases first apply to the year immediately following the latest year for which valuation compensation is shown.
- (44) The full funding limitations based on current liability shall be disregarded if sufficient information to determine such limitations is not provided.

- (45) For purposes of determining the deductible limit, the unfunded current liability shall be disregarded if sufficient information to determine such liability is not provided.
- (46) The plan is not currently in at-risk status nor has it ever been in at-risk status.
- (47) The terms “at-risk funding target” and “at-risk target normal cost” mean the funding target and target normal cost calculated reflecting additional actuarial assumptions and loading factors (if applicable) for a plan in at-risk status prior to the application of any five-year transition as described in IRC section 430(i)(5).
- (48) There have been no late quarterly contributions (and thus no associated interest penalties), and there is no liquidity shortfall, unless sufficient information to determine such amounts is provided.
- (49) For a statutory hybrid (cash balance) plan, hypothetical accounts are assumed to be calculated in the following manner:
- Pay credits are added annually to the hypothetical accounts at the end of the plan year.
  - Interest credits are added annually to the hypothetical accounts at the end of the plan year.
  - Interest credits are calculated using the hypothetical accounts as of the beginning of the plan year.

The values of the hypothetical accounts at the beginning of a plan year are equal to the values of the hypothetical accounts at the end of the prior plan year.

## **GENERAL CONDITIONS REGARDING BENEFIT RESTRICTIONS**

- (50) AFTAPs have been certified on a timely basis.
- (51) The plan has provisions for automatically restoring accruals ceased due to the application of IRC section 436, to the extent permitted by regulations, and the plan’s actuary has provided the required certification to permit such restoration.

## **MISCELLANEOUS GENERAL CONDITIONS**

- (52) All plan provisions and funding calculations comply with all temporary and final regulations under the Internal Revenue Code and ERISA, as amended through May 31, 2021, and proposed regulations as listed in the Suggested Readings.
- (53) The plan is sponsored by a single employer; the sponsoring employer is a taxable entity and is not a member of a controlled group.
- (54) The plan is not established or maintained in connection with a collective bargaining agreement.
- (55) Employees subject to a collective bargaining agreement are non-professional. If employees covered by a collective bargaining agreement are covered by the plan, their coverage is pursuant to that collective bargaining agreement.
- (56) The plan year, the employer's limitation year, and the employer's tax year are all the calendar year.
- (57) The employer has never maintained a defined contribution plan or another defined benefit plan. No employee has been covered by a defined contribution or defined benefit plan that is required to be aggregated with his employer’s plans for purposes of IRC section 415.

- (58) Where IRC section 401(a)(17) applies, compensation does not exceed these limits unless sufficient information to apply the limits is provided.
- (59) Benefits do not exceed IRC section 415 limits unless sufficient information to apply these limits is provided.
- (60) The plan is covered by the PBGC.
- (61) All union plans are collectively bargained and all union employees are subject to collective bargaining.
- (62) The plan sponsor is not now, and never has been, in bankruptcy.
- (63) References to law and regulation section numbers are for clarity and can be assumed to be correct.
- (64) Even if not so, assume all due dates are NOT Saturdays, Sundays, or holidays.
- (65) Disregard any industry-specific rules. Furthermore, plans are not CSEC plans nor are they eligible for PPA delayed effective dates (PPA sections 104-106).
- (66) The plan has not been top-heavy in any year.
- (67) The plan sponsor did not elect funding relief under the Pension Relief Act of 2010 for any plan year.
- (68) A multiemployer plan has never applied for approval to suspend benefits as provided in IRC section 432(e)(9).
- (69) A multiemployer plan is not in “Endangered Status”, “Seriously Endangered Status”, “Critical Status”, or “Critical and Declining Status” for the plan year or any prior plan year unless sufficient information to determine the status is provided.
- (70) A multiemployer plan has never applied for approval to receive special financial assistance from the PBGC as provided in IRC section 432(k) and ERISA section 4262.

**If applicable, the preceding conditions should be considered a part of the data for each question, unless otherwise stated or implied.**



## IMPORTANT

**THESE FACTORS MAY BE USED FOR ALL QUESTIONS UNLESS OTHER FACTORS ARE PROVIDED,  
FOR BOTH SINGLE EMPLOYER AND MULTIPLE EMPLOYER PLANS**

### 2022 EA-2 (Segment F) Examination - Selected Commutation Factors Interest Rates: 3.0%, 4.0%, and 5.0%

MALES	Interest Rate = 3.0%		Interest Rate = 4.0%		Interest Rate = 5.0%		MALES
Age	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	Age
60	158,832	2,668,048	88,955	1,339,311	50,097	681,130	60
61	153,222	2,511,787	84,988	1,252,174	47,407	632,266	61
62	147,728	2,361,083	81,153	1,168,943	44,837	586,037	62
63	142,346	2,215,821	77,444	1,089,490	42,380	542,326	63
64	137,069	2,075,894	73,856	1,013,690	40,032	501,022	64
65	131,893	1,941,197	70,384	941,425	37,787	462,019	65
66	126,816	1,811,631	67,024	872,581	35,640	425,216	66
67	121,829	1,687,101	63,769	807,049	33,586	390,518	67
68	116,929	1,567,518	60,616	744,725	31,621	357,832	68
69	112,108	1,452,798	57,558	685,511	29,740	327,073	69
70	107,357	1,342,868	54,589	629,314	27,937	298,159	70
71	102,670	1,237,660	51,704	576,048	26,209	271,014	71
72	98,039	1,137,112	48,896	525,631	24,550	245,565	72
73	93,454	1,041,175	46,162	477,988	22,956	221,746	73
74	88,909	949,804	43,494	433,049	21,424	199,492	74
75	84,396	862,964	40,890	390,748	19,949	178,745	75
76	79,909	780,624	38,343	351,026	18,528	159,447	76
77	75,441	702,764	35,851	313,825	17,159	141,546	77
78	70,988	629,364	33,411	279,092	15,839	124,992	78
79	66,546	560,412	31,019	246,778	14,565	109,737	79
80	62,115	495,897	28,675	216,833	13,336	95,736	80
81	57,693	435,809	26,378	189,210	12,151	82,943	81
82	53,299	380,129	24,135	163,861	11,012	71,314	82
83	48,937	328,829	21,946	140,729	9,918	60,804	83
84	44,616	281,872	19,816	119,759	8,870	51,366	84
85	40,348	239,212	17,748	100,891	7,869	42,955	85

FEMALES	Interest Rate = 3.0%		Interest Rate = 4.0%		Interest Rate = 5.0%		FEMALES
Age	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	Age
60	162,908	2,899,546	91,238	1,446,852	51,383	731,957	60
61	157,444	2,739,143	87,330	1,357,405	48,713	681,798	61
62	152,095	2,584,150	83,552	1,271,807	46,162	634,254	62
63	146,859	2,434,455	79,900	1,189,929	43,724	589,209	63
64	141,733	2,289,946	76,369	1,111,647	41,394	546,553	64
65	136,711	2,150,515	72,955	1,036,842	39,167	506,180	65
66	131,792	2,016,058	69,654	965,400	37,038	467,989	66
67	126,967	1,886,478	66,459	897,211	35,003	431,883	67
68	122,232	1,761,681	63,365	832,170	33,055	397,773	68
69	117,577	1,641,583	60,366	770,180	31,191	365,572	69
70	112,996	1,526,105	57,456	711,148	29,405	335,200	70
71	108,480	1,415,179	54,629	654,988	27,692	306,580	71
72	104,020	1,308,744	51,880	601,619	26,048	279,642	72
73	99,610	1,206,744	49,203	550,966	24,468	254,318	73
74	95,242	1,109,136	46,592	502,960	22,949	230,546	74
75	90,907	1,015,881	44,044	457,535	21,488	208,266	75
76	86,600	926,948	41,554	414,632	20,080	187,424	76
77	82,311	842,314	39,116	374,196	18,722	167,966	77
78	78,032	761,964	36,726	336,175	17,411	149,846	78
79	73,757	685,892	34,380	300,524	16,143	133,016	79
80	69,477	614,097	32,074	267,201	14,917	117,435	80
81	65,185	546,587	29,803	236,168	13,729	103,063	81
82	60,891	483,370	27,572	207,387	12,580	89,860	82
83	56,595	424,448	25,381	180,819	11,470	77,789	83
84	52,298	369,822	23,228	156,425	10,397	66,811	84
85	48,007	319,490	21,117	134,165	9,362	56,888	85

## IMPORTANT

THESE FACTORS MAY BE USED FOR ALL QUESTIONS UNLESS OTHER FACTORS ARE PROVIDED,  
FOR BOTH SINGLE EMPLOYER AND MULTIPLE EMPLOYER PLANS

### 2022 EA-2 (Segment F) Examination - Selected Commutation Factors Interest Rates: 5.0%, 6.0%, and 7.0%

MALES	Interest Rate = 5.0%		Interest Rate = 6.0%		Interest Rate = 7.0%		MALES
Age	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	Age
60	50,097	681,130	28,367	350,697	16,149	182,683	60
61	47,407	632,266	26,591	323,144	14,996	167,062	61
62	44,837	586,037	24,912	297,323	13,918	152,560	62
63	42,380	542,326	23,325	273,138	12,910	139,104	63
64	40,032	501,022	21,825	250,501	11,966	126,627	64
65	37,787	462,019	20,406	229,326	11,084	115,065	65
66	35,640	425,216	19,065	209,535	10,259	104,359	66
67	33,586	390,518	17,797	191,051	9,487	94,454	67
68	31,621	357,832	16,598	173,803	8,765	85,298	68
69	29,740	327,073	15,463	157,725	8,090	76,843	69
70	27,937	298,159	14,389	142,755	7,457	69,043	70
71	26,209	271,014	13,371	128,832	6,865	61,857	71
72	24,550	245,565	12,407	115,903	6,310	55,246	72
73	22,956	221,746	11,492	103,916	5,790	49,175	73
74	21,424	199,492	10,623	92,822	5,303	43,608	74
75	19,949	178,745	9,799	82,576	4,845	38,515	75
76	18,528	159,447	9,015	73,137	4,416	33,866	76
77	17,159	141,546	8,270	64,463	4,013	29,634	77
78	15,839	124,992	7,562	56,517	3,635	25,794	78
79	14,565	109,737	6,888	49,264	3,281	22,321	79
80	13,336	95,736	6,247	42,670	2,948	19,193	80
81	12,151	82,943	5,639	36,701	2,635	16,389	81
82	11,012	71,314	5,062	31,327	2,344	13,887	82
83	9,918	60,804	4,516	26,516	2,071	11,668	83
84	8,870	51,366	4,001	22,236	1,818	9,713	84
85	7,869	42,955	3,515	18,458	1,583	8,003	85

FEMALES	Interest Rate = 5.0%		Interest Rate = 6.0%		Interest Rate = 7.0%		FEMALES
Age	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	$D_x$	$N_x^{(12)}$	Age
60	51,383	731,957	29,095	375,125	16,563	194,614	60
61	48,713	681,798	27,324	346,842	15,409	178,580	61
62	46,162	634,254	25,648	320,286	14,329	163,665	62
63	43,724	589,209	24,064	295,364	13,319	149,799	63
64	41,394	546,553	22,567	271,986	12,373	136,914	64
65	39,167	506,180	21,152	250,067	11,489	124,946	65
66	37,038	467,989	19,813	229,529	10,661	113,836	66
67	35,003	431,883	18,548	210,296	9,887	103,529	67
68	33,055	397,773	17,351	192,297	9,163	93,974	68
69	31,191	365,572	16,218	175,465	8,484	85,123	69
70	29,405	335,200	15,145	159,740	7,849	76,930	70
71	27,692	306,580	14,128	145,061	7,253	69,354	71
72	26,048	279,642	13,164	131,375	6,695	62,356	72
73	24,468	254,318	12,249	118,631	6,172	55,901	73
74	22,949	230,546	11,380	106,780	5,680	49,954	74
75	21,488	208,266	10,555	95,778	5,219	44,485	75
76	20,080	187,424	9,770	85,583	4,786	39,465	76
77	18,722	167,966	9,023	76,155	4,379	34,865	77
78	17,411	149,846	8,312	67,458	3,996	30,661	78
79	16,143	133,016	7,634	59,456	3,636	26,830	79
80	14,917	117,435	6,988	52,118	3,297	23,350	80
81	13,729	103,063	6,371	45,413	2,978	20,199	81
82	12,580	89,860	5,783	39,312	2,678	17,359	82
83	11,470	77,789	5,223	33,786	2,396	14,811	83
84	10,397	66,811	4,689	28,808	2,131	12,536	84
85	9,362	56,888	4,183	24,350	1,883	10,519	85

**2022 EA-2 (Segment F) Examination - Selected Amortization Factors**

**Segment Rates = {3.0%, 4.0%, 5.0%}**

<b><u>Remaining Period</u></b>	<b><u>Amortization Factor</u></b>
7 years	6.3293
6 years	5.5390
5 years	4.7171
4 years	3.8286
3 years	2.9135
2 years	1.9709

**Segment Rates = {5.0%, 6.0%, 7.0%}**

<b><u>Remaining Period</u></b>	<b><u>Amortization Factor</u></b>
7 years	5.9982
6 years	5.2932
5 years	4.5460
4 years	3.7232
3 years	2.8594
2 years	1.9524

**LIMITS AND TABLES**  
(Included with the 2022 EA-2 (Segment F) examination)

<b>Maximum Benefit Limit IRC section 415(b)</b>	
<u>Year</u>	<u>Limit at 65</u>
2009-2011	195,000
2012	200,000
2013	205,000
2014-2016	210,000
2017	215,000
2018	220,000
2019	225,000
2020-2021	230,000
2022	245,000

<b>Compensation Limit IRC section 401(a)(17)</b>	
<u>Year</u>	<u>Limit</u>
2009-2011	245,000
2012	250,000
2013	255,000
2014	260,000
2015-2016	265,000
2017	270,000
2018	275,000
2019	280,000
2020	285,000
2021	290,000
2022	300,000

<b>Key Employee Compensation IRC section 416</b>		
<u>Year</u>	<u>Officer</u>	<u>1% owner</u>
2009-2011	160,000	150,000
2012-2013	165,000	150,000
2014-2016	170,000	150,000
2017-2018	175,000	150,000
2019	180,000	150,000
2020-2021	185,000	150,000
2022	200,000	150,000

<b>Highly Compensated Employee Compensation IRC section 414(q)</b>	
<u>Year</u>	<u>Limit</u>
2009-2011	110,000
2012-2014	115,000
2015-2018	120,000
2019	125,000
2020-2021	130,000
2022	135,000