

Pursuant to Articles 153 paragraph 6 and 177 item 4 of the Law on Insurance (Official Gazette of the Republic of Montenegro, No 78/06 and 19/07, Official Gazette of Montenegro, No 45/12), the Council of the Insurance Supervision Agency adopted the

## **RULEBOOK ON REQUIREMENTS FOR TAKING THE EXAM, THE MANNER OF TAKING THE EXAM AND PROGRAM OF THE PROFESSIONAL EXAM FOR CONDUCTING AUTHORISED ACTUARY ACTIVITIES**

(Official Gazette of Montenegro, No 02/14 of 14 January 2014)

### **Article 1**

This Rulebook prescribes the requirements for taking the exam, the manner of taking the exam and program of the professional exam for conducting authorised actuary activities (hereinafter referred to as the Professional Exam).

### **Professional Exam**

### **Article 2**

The Professional Exam shall include the following subjects (hereinafter referred to as the Professional Exam Program):

- 1) Financial mathematics;
- 2) Probability and mathematical statistics;
- 3) Economics;
- 4) Insurance accounting;
- 5) Stochastic modelling;
- 6) Survival model;
- 7) Actuarial mathematics I;
- 8) Actuarial mathematics II;
- 9) Investments and asset management;
- 10) Non-life insurance;
- 11) Life insurance;
- 12) Pension insurance;
- 13) Health insurance;
- 14) Professionalism and code of ethics;
- 15) National legislation.

The content of subjects referred to in paragraph 1 of this Article shall be in the Annex 1 to this Rulebook and makes its integral part.

### **Article 3**

The Insurance Supervision Agency (hereinafter referred to as the Agency) shall organise training and taking of the Professional Exam.

Notwithstanding paragraph 1 of this Article, training and taking of exam for subjects referred to in Article 2 paragraph 1 items 1 to 14 may also be organised by an institution authorised by the Agency.

### **Commission for Taking the Professional Exam** **Article 4**

The Council of the Agency shall establish a special commission for organising and taking the Professional Exam (hereinafter referred to as the Commission).

The Commission shall have five members of whom one shall be a chairperson, and shall be made of one person from the Agency and four persons from within the ranks of recognised experts in the fields of insurance, actuary, and finance.

The Commission shall have a secretary who is appointed from within ranks of employees of the Agency.

The Commission shall be entitled to remuneration, established by a decision of the Council of the Agency.

The Agency shall provide conditions for work of the Commission (premises and means) and shall keep the documentation obtained in the process of training for taking the exam, holding of exam and issuing authorisations.

### **Registering for the Professional Exam** **Article 5**

The Agency shall publish an invitation to register for training and taking of the Professional Exam on its Web site.

The invitation must contain also a minimum number of candidates required for the Professional Exam to be organised.

The application for training and taking of the Professional Exam shall be submitted to the Agency using the stipulated form – contained in Annex 2 to this Rulebook and which makes its integral part.

Interested candidates shall be obliged to submit the following along with the application:

- Diploma certified copy, as an evidence of acquired higher education, in case of foreign persons a document providing evidence of education level equivalent to the professional education specified in indent 1 of this paragraph translated by a court certified translator,
- Identity card certified copy or copy of a biometric identity card, or a passport certified copy for foreign persons,
- Certificate from an employer evidencing work experience in actuarial activities in an insurance company or in activities of controlling actuarial calculations in an authority competent for insurance supervision for a period of at least three years.

Upon receiving the application, the Agency shall assess whether requirements referred to in paragraph 3 of this Article are met and shall publish list of candidates approved to take the training and take the Professional Exam.

### **Training for Taking the Professional Exam**

#### **Article 6**

The Agency shall publish on its Web site the information of holding the training referred to in Article 3 of this Rulebook by no later than one month prior to commencement of the training.

The attendance at the training shall be mandatory.

No training shall be organised for the subject referred to Article 2 paragraph 1 item 15 of this Rulebook.

### **Taking the Exam**

#### **Article 7**

The Commission shall determine the manner of taking the Professional Exam, by subjects from the Program referred to in Article 2 of this Rulebook and other organisation matters concerning the training and taking the exam by way of a special instruction.

### **Grading and Publishing Results**

#### **Article 8**

A lecturer for a specific subject shall grade the success of a candidate at the conducted exam and shall assign score to the candidate

Based on the assigned score, the Commission shall grade descriptively the success of each candidate as “passed” or “failed”.

The candidate shall have to score at least 60% of the total score on the exam for an individual subject in order to be awarded the grade “passed”.

The candidate may take exam of an individual subject maximum three times.

For the candidate who in all three examination periods fails to obtain a success in an individual subject, the success obtained in previous exam taking from other subjects shall be cancelled.

#### **Article 9**

The Agency shall publish a list of candidates who have passed a specific subject on its Web site.

The candidate may examine his test or lodge an objection concerning the success obtained at the exam no later than within five days as of the day the exam results for a specific subject are published.

The Commission shall be obliged to decide on the merits of the objection referred to in paragraph 2 of this Article within eight days as of the day the objection is received and shall notify a person who lodged the objection on its decision.

Upon each examination period, the Commission shall prepare a report containing the following data:

- Title of the subject and training duration;
- Date, place and time of holding the exam;
- Name, surname and habitual residence of candidates who have taken the exam, with achieved result at the exam;
- Date of the report and signatures of the chairperson, members and the secretary of the Commission.

The Commission shall prepare the report referred to in paragraph 4 of this Article within 10 days as of the day of publication of results of taking the exam and shall submit it to the Agency.

### **Article 10**

The Professional Exam shall be deemed as passed when the candidate has successfully passed all subjects referred to Article 2 of this Rulebook.

The Agency shall issue a certificate on the passed Professional Exam to a candidate who has passed the Professional Exam within 30 days as of the day of publication of results of taking the exam for the last subject.

The certificate referred to in paragraph 2 of this Article shall contain:

- Name, surname, date and place of birth of the candidate;
- Indication that the candidate has passed the exam for conducting actuarial activities;
- Issue date and number of the certificate;
- Signatures of the Chairperson of the Commission and President of the Council of the Agency, as well as the seal of the Agency.

The Agency shall keep records on certificates issued on the passed Professional Exam.

### **Recognition of Exam for Conducting Actuarial Activities Passed Abroad**

#### **Article 11**

The Commission shall decide on recognition of exam for conducting actuarial activities passed abroad on a session held twice a year.

A person who has passed the exam for conducting actuarial activities abroad shall submit to the Commission a request for recognition of that exam accompanied with the following documentation:

- Certificate on passed subjects, with an overview of grades, issued by an institution competent for carrying out training organising the exam taking for acquiring authorisations for conducting actuary activities;
- Syllabus and curriculum used to deliver the training by individual subjects, published by an authority competent for organising actuarial training;
- Notary certified translation of all documents if those are written in a language not in official use in Montenegro;
- Evidence on payment of the fee set by a separate act of the Agency;
- Other documentation upon request of the Commission.

The exam for conducting actuarial activities passed abroad may be recognised if there is at least 75% overlap with a curriculum used when that exam was passed with the contents of the subjects for the professional Exam referred to in Article 2 paragraph 2 of this Rulebook.

The Commission shall decide on recognition of the entire or part of the exam for conducting actuarial activities passed abroad within 30 days as of the day from the lapse of deadline for submission of applications and shall notify each candidate on remaining exams he shall be obliged to pass in order to obtain the certificate referred to in Article 10 paragraph 3 of this Rulebook.

### **Recognition of Exams Passed at the Higher Education Institution Article 12**

The Commission shall recognise individual subjects making integral part of the Professional Exam referred to in Article 2 of this Rulebook passed at some higher education institution, as part of master and doctoral studies, if there is at least 75% overlap with a curriculum used when that exam was passed with the contents of the subjects for the Professional Exam referred to in Article 2 paragraph 2 of this Rulebook.

### **Article 13**

This Rulebook shall enter into force on the eighth day following the day of its publication in the Official Gazette of Montenegro.

Number: 01-1187/3-13  
Podgorica, 27 December 2013

President of the Council  
Branko Vujović, m.p.

**Annex 1:****PROGRAM FOR TAKING THE PROFESSIONAL EXAM FOR CONDUCTING INSURANCE  
BROKERAGE OR AGENCY ACTIVITIES****FINANCIAL MATHEMATICS**

1. Simple and compound interest account;
2. Nominal, effective, compound and effective interest rate; Continuous compounding;
3. Yield rate and discount rate; Setting prices for short-term discounts and interest-bearing securities;
4. Financial rent; Financial-mathematics calculus on lending, discount, mortgage and foreign exchange markets;
5. Discounted cash flows – net present values and yield, lending and deposit interest rate, effects of inflation;
6. Prices of securities and yield; Yield curve; Volatility; Models for determining prices of shares and bonds;
7. Interest rate risk management; Duration, modified duration and convexity;
8. Financial-mathematics calculus on financial derivatives market;
9. Dynamic portfolio management; Portfolio of insurance companies;
10. Stochastic interest rate theory; Stochastic calculus in finances;

**PROBABILITY AND MATHEMATICAL STATISTICS**

1. Introduction to probability theory;
2. Descriptive data analysis;
3. Random variables and their properties;
4. Generating functions;
5. Common distribution of random variables;
6. Central limit theorem and its application;
7. Sampling and statistical induction and deduction;
8. Point estimation of parameters;
9. Confidence intervals;
10. Statistical hypothesis testing;
11. Correlation and regression analysis;
12. Variance analysis;
13. Conditional expectation, conditional variance;

**ECONOMICS**

1. Introduction to economics science and core terminology;
2. Supply, demand and prices;
3. Elasticity and its application;
4. Utility theory and consumer behaviour theory;
5. Production function; Production factors and their mutual relations;
6. Theory and analysis of costs;
7. Macro-economic indicators – GDP, inflation, unemployment, wages;
8. Savings, investments and financial system;

9. Basics of fiscal, monetary and foreign exchange policy;
10. Macro-economic policy;
11. Economic growth and development, economic cycles;
12. Basics of international economy;

### **INSURANCE ACCOUNTING**

1. Accounting terminology and principles;
2. International Financial Reporting Standards and application of standards in insurance sector;
3. Chart of Accounts for insurance companies;
4. Specificities of accounting for insurance companies;
5. Accounting of non-life insurance;
6. Accounting of life insurance;
7. Financial Reporting;
8. Analysis of financial reports of insurance companies;
9. Internal and external control of financial reports in insurance sector;
10. Specificities of accounting for pension and health insurance;

### **STOCHASTIC MODELLING**

1. Model structure and principles of actuarial modelling;
2. Stochastic processes;
3. Markov chains;
4. Markov jump process;
5. Time series analysis;
6. Brownian motion and diffusion;
7. Introduction to Monte Carlo simulation of stochastic processes;
8. Actuarial modelling process;

### **SURVIVAL MODEL**

1. Survival model and mortality tables;
2. Estimate of life expectancy distribution – statistical deduction about the model; Censoring mechanisms; Kaplan-Meier and Nelson-Aalen estimators; Parametric models; Cox model;
3. Two-stage Markov process;
4. Multi-stage Markov process;
5. Binominal and Poisson model;
6. Equalisation, equalisation methods and statistical tests;
7. Risk exposure;
8. Heterogeneity in population; Selection;
9. Calculating insurance value and value of annuities (actuarial notations and examples);
10. Examples and reserves;

### **ACTUARIAL MATHEMATICS I**

1. Two lives function;

2. Use of functions that include selection;
3. Contracts with variable indemnity; Contracts in case of incapacity to work and long-term care;
4. Costs and bonuses of a life insurance contract;
5. Gross premiums and reserves for contract with fixed and variable indemnity;
6. Technique of discounting future costs;
7. Technique of bonuses in the life insurance contracts context;
8. Changes to contracts;
9. Costs of guarantees under life-insurance contracts;
10. Mortality: selection and standardisation;
11. Population forecast process and its main drivers;
12. Valuation of indemnities under contracts in case of incapacity to work;

### **ACTUARIAL MATHEMATICS II**

1. Core terminology of the decision theory;
2. Bayesian statistics;
3. Damages distribution;
4. Risk models;
5. Insolvency theory;
6. Credibility theory;
7. Simple system for determining premiums by experience;
8. Analysis of development triangles;
9. Generalised liner models;

### **INVESTMENTS AND ASSET MANAGEMENT**

1. Types of investments and their features;
2. Capital market;
3. Investment risks; Modern portfolio theory;
4. Valuation of financial instruments;
5. Institutional investors;
6. Individual investors;
7. Techniques for development of investment strategies;
8. Measuring efficiency of investments;
9. Legislative aspects and other limitations;

### **NON-LIFE INSURANCE**

1. Actuarial control cycle;
2. Non-life insurance principles (Features of core types of contracts; Types of reinsurance; Non-life insurance market);
3. Risk and uncertainty in non-life insurances;
4. Data and verification of data;
5. Determining premium;
6. Methods and databases for determining reserves;
7. Determining an appropriate reinsurance;
8. Investment principles and adjusting assets and liabilities;
9. Experience analysis;



### **LIFE INSURANCE**

1. Actuarial control cycle;
2. Life insurance principles - Features of core types of contracts; Profit distribution methods; Life insurance market;
3. Risk and uncertainty in life insurances;
4. Data and verification of data;
5. Determining design of products and actuarial assumptions;
6. Determining premium and valuation of life insurance contracts;
7. Surrender and changes in policies;
8. Solvency;
9. Reinsurance and risk assumption;
10. Experience analysis –Analysis of mortality, costs, return on investment; Surplus analysis (profit);
11. Value of insurers for life insurances;
12. Required capital;

### **PENSION INSURANCE**

1. Pension insurance: objectives, principles, financing principles;
2. System of current financing of pension insurance – (Pay-as-you-go – PAYGO);
3. Financing of pension insurance through capitalised savings (Fully funded system);
4. Defined benefits system;
5. Defined contributions system;
6. Actuarial assessment techniques; Demographic projections; Financial projections;
7. Pension system in Montenegro; Pension system reform;

### **HEALTH INSURANCE**

1. Health insurance definition, concept and health insurance system;
2. Mandatory health insurance;
3. Voluntary health insurance;
4. Health insurance financing models;
5. Types of the health insurance products; Individual and group health insurance products;
6. Determining tariffs and calculating technical reserves;
7. Organisation of the healthcare system in Montenegro; Healthcare system reform;

### **PROFESSIONALISM AND CODE OF ETHICS**

1. Characteristics and standards of the actuary profession:
  - a. Actuary profession in the World and the region,
  - b. Specialised knowledge and skills,
  - c. Continuous development and education,
  - d. High quality of advice,
  - e. Independency of opinion,
  - f. Objectivity, integrity and accountability;
2. International Actuarial Association (IAA, *Groupe Consultatiffe*);

3. Oversight role of actuaries;
4. Professional role of actuaries:
  - a. Analysis and resolution of ethical challenges,
  - b. Recognising and managing conflicts,
  - c. Nature of advise,
  - d. Public interest;

### **NATIONAL LEGISLATION**

1. Law on Insurance;
2. Law on Compulsory Transport Insurance;
3. Secondary legislation:
  - Rulebook on the Manner of Calculating the Solvency Margin,
  - Rulebook on Restrictions Related to Depositing and Investing Technical Reserve Funds and Capital Funds of the Insurance Company,
  - Rulebook on Detailed Criteria and Manner of Calculating Mathematical Provisions and Special Provisions for the Life Insurance where the Investment Risk is Borne by the Insured Person,
  - Rulebook on Detailed Criteria and Manner of Calculating Unearned Premiums,
  - Rulebook on Detailed Criteria and Manner of Calculating Risk Equalization Reserves,
  - Rulebook on Detailed Criteria and Manner of Calculating Technical Reserves for Outstanding Claims,
  - Rulebook on Characteristics of Subordinated Debt Instruments that can be Included in the Additional Capital of the Insurance Company,
  - Rulebook on the Contents of the Authorised Actuary's Opinion,
  - Rulebook on the Manner of Determining and Monitoring the Insurance Company Liquidity.

**Annex 2**

**INSURANCE SUPERVISION AGENCY  
Moskovska 17 A M/C1, 81000 Podgorica**

**APPLICATION  
FOR TRAINING AND TAKING PROFESSIONAL EXAM FOR CONDUCTING  
AUTHORISED ACTUARY ACTIVITIES**

**Name and surname of the applicant :** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Contact telephone:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Enclosed documentation (*circle submitted documents*):**

1. University diploma or certificate on graduation (original, certified copy, translated by a certified translator – *underline submitted document*);
2. Evidence of (*underline submitted document*):
  - Diploma certified copy, a proof of acquired higher education, for foreign persons a document evidencing the education degree equivalent to professional education from indent 1 of this paragraph, translated by a court certified translator);
  - Identity card certified copy or copy of a biometric identity card, or a passport certified copy for foreign persons;
  - Certificate from an employer evidencing work experience in actuarial activities in an insurance company or in activities of controlling actuarial calculations in an authority competent for insurance supervision for a period of at least three years.
3. Evidence of paid fee for taking the Professional Exam

Applicant

Podgorica on \_\_\_\_\_ 20\_\_