

SYLLABUS OF THE ADMISSIONS TEST

for the applicants to main educational master programs

Master in Management – MIM, codeCM.5669. 2018

Master in Corporate Finance – MCF, codeCM.5603. 2018

Master in Business Analytics and Big Data - MiBA

in the following subject: "Management and Business English"

SECTION I. CONTENTS OF THE MAIN TOPICS

1. Quantitative Section. Quantitative section is to estimate basic math and analysis skills, ability to solve quantitative problems and to work with graphical information. Quantitative section includes 20 questions of two types:

- Problem solving;
- Data Sufficiency.

1.1 Basic terms

1.1.1. Natural numbers. Divisibility. Prime numbers and composite numbers. Greatest common divisor and lowest common multiple. Integer, rational and real numbers. Percent. Absolute value, power, root, arithmetical root, logarithm.

1.1.2. Numerical and algebraic expressions. Equalities and identities. Function, domain and codomain. Increase, decrease, periodicity, evenness, oddness of function. Max and min value of function. Function graph. Linear, quadratic, power, exponential and logarithmic function. equation, inequalities, combined equations. Solution of equation, inequality and combined equations. equivalence. Arithmetic and geometric series.

1.1.3. Line on plane. Segment, broken line, angle. Triangle. Median, bisector, altitude. Convex Polygon. Square, rectangle, parallelogram, rhomb, trapezium. Regular polygon. Diagonal. Circumference and circle. Radius, chord, diameter, tangent, secant. Arc of circle and circular sector. Central and inscribed angle.

1.1.4. Logic. Necessary and sufficient condition.

1.2. Theoretical part

1.2.1. *Arithmetic and algebra*

1.2.1.1. Sets – basic terms. Set operation. A Venn diagram.

1.2.1.2. Number axis. Positive, negative numbers. Absolute value and its geometric sense.

1.2.1.3. Natural numbers (N). Prime and composite number. Divisor, multiple.

1.2.1.4. Greatest common divisor and lowest common multiple.

1.2.1.5. Criterion for divisibility for 2, 3, 5, 9, 10. Division with a remainder

1.2.1.6. Integer numbers (Z). rational quantities (Q), addition, subtraction, multiplication and division.

1.2.1.7. Proportions.

1.2.1.8. Decimal and ordinary fraction, its transformation one to the other. Round-up with prescribed accuracy.

1.2.1.9. Power with natural, integer and rational value. Arithmetical root. Operations with powers.

1.2.1.10. Percent calculation. Bank interest, compound interest.

1.2.1.11. Function. Function assignment (table, graph). Function increasing and decreasing.

1.2.1.12. Polynomial with one variable. Root of polynomial. Properties and graph of quadratic polynomial. Formula for quadratic polynomial roots. Vieta's theorem.

1.2.1.13. Numerical expression. Expression with variables. Algebraic manipulation, formulas for short multiplication.

1.2.1.14. Equation. The root of an equation. Equivalent equations.

2.2.1.15. Two combined linear equations with two variables and its properties.

2.2.1.16. Inequalities. Properties of numerical inequalities. Solving inequality with a variable. Equivalent inequalities.

1.2.1.17. Arithmetic and geometric series.

1.2.1.18. The method of coordinates on a plane (foundations).

1.2.2 *Combinatorial calculus, probability theory and statistics.*

1.2.2.1. Permutations, arrangements, combinations.

1.2.2.2. Arithmetic mean, median, mode.

1.2.2.3. Standard deviation.

1.2.3. *Geometry*

1.2.3.1. Line, ray, segment, broken line; segment length. Angle, the measure of angle. Vertical and contiguous angles. Parallel lines, angles with parallel lines.

1.2.3.2. Triangle. Median, bisector, altitude. Criteria for equivalence of triangles. The interior angles of a triangle and its sum. Types of Triangles. Properties of isosceles and equilateral triangles.

1.2.3.3. Right-angled triangle. Pythagorean theorem, numerical right triangle.

1.2.3.4. Quadrangle: parallelogram, rectangle, rhomb, square, trapezium.

1.2.3.5. Circumference and circle. center of circle chord, diameter, radius. Tangent to circle.

1.2.3.6. Circuit.

1.2.3.7. Arc of circle, arc distance. Sector, segment. Central and inscribed angle, their properties. Regular polygon

1.2.3.8. Area of triangle, parallelogram, rectangle, trapezium.

1.2.3.9. Similarity. Criteria for similarity of triangles. Relations between linear elements and areas of similar triangles.

1.2.3.10. Formula for surface area and volume of prism.

1.2.3.11. Formula for surface area and volume of pyramid.

1.2.3.12. Formula for surface area and volume of cylinder.

1.2.3.13. Formula for surface area and volume of cone.

1.2.3.14. Formula for volume of sphere

1.2.4. *Logic*

1.2.4.1. Necessary and sufficient condition.

2. The Verbal Section consists of 20 questions belonging to three types:

- *Reading Comprehension (6 questions),*
- *Critical Reasoning (4 questions) and*
- *Sentence Correction (10 questions).*

The Verbal Section evaluates the following skills: comprehension of the text the applicant has read; evaluation of the reasoning quality; ability to see mistakes in a sentence that do not correspond to the accepted standards of the official register of written Business English.

Lexical material. The applicant is expected to demonstrate an active skill to understand lexical units common for the scientific and formal styles of English (Wall Street Journal, New York Times, various scientific publications, etc.).

2.1. Reading Comprehension questions

2.1.1. A reading comprehension assignment includes a scientific text passage of 350 words or less. The range of topics includes: social sciences, physics, biology and business-related fields (marketing, economics, HR, etc.). The questions are composed so that answering any of them involves using what has been stated or supposed in the text of the assignment.

2.1.2. A reading comprehension assignment includes a text and questions concerning the right interpretation of the text.

2.1.3. Reading comprehension questions have been developed in order to evaluate the applicant's ability to comprehend, analyse and use the information and ideas expressed in the text.

2.1.4. *Basic terms.*

2.1.4.1. Types of questions: main idea question, supporting idea question, inference type question.

2.1.4.2. Reading strategies: detailed reading and skimming.

2.1.4.3. Text structure: paragraph structure.

2.2. Critical Reasoning questions

2.2.1. A critical reasoning assignment includes a judgment, a question and five answer choices.

2.2.2. Critical reasoning questions have been developed in order to check the applicants' reasoning skills as well as their skills to evaluate the validity thereof. The questions are based on materials from various sources. No specific knowledge is needed to answer this type of questions correctly.

2.2.3. *Basic terms.*

2.2.3.1. Reasoning logic analysis: proofs, conclusion, assumption.

2.2.3.2. The skill of making logical conclusion of what you have read and understanding what the statement is based on.

2.2.3.3. Methods of forward and backward reasoning. Induction. Comparison and analogy. Cause-and-effect relationship. Deduction.

2.2.3.4. Search for additional validation and contradiction.

2.3. Sentence Correction questions

2.3.1. In a sentence correction assignment the applicant must choose one of the five suggested answers expressing the initial sentence idea best. To answer the question correctly, the applicants must have a good knowledge of written English stylistics and grammar. The applicants must also demonstrate their ability to correct grammatically and stylistically incorrect phrases.

2.3.2. *Grammar material*

2.3.2.1. Rules of grammar and good knowledge of the official register of Business English.

2.3.2.2. Tenses.

2.3.2.3. Subject/predicate coordination.

2.3.2.4. Adverbial phrases.

2.3.2.5. Pronoun.

2.3.2.6. Comparative structures.

2.3.2.7. Parallel structures.

2.3.2.8. Prepositions and idioms.

SECTION II. BIBLIOGRAPHY

Main literature:

1. Graduate Management Admission Council (GMAC). The Official Guide for GMAT Review 2016. (2015). Hoboken, New Jersey: John Wiley & Sons, Inc.

2. Kaplan. GMAT, 2011 Premier.

3. Hasik J., Rudnick S., Hackney R. (2012). McGraw-Hill's GMAT 2013: 10 Practice Tests. McGraw-Hill.

Databases, reference and search systems:

libraries

Russian State Library

www.rsl.ru

Russian National Library

www.nlr.ru

Library of the Russian Academy of Sciences

www.rasl.ru

Natural Sciences Library of the Russian Academy of Sciences

www.benran.ru

SPbU Research Library

www.bio.spbu.ru/library

Research electronic Library eLIBRARY.RU

www.elibrary.ru

SECTION III. ORGANISATION AND METHODOLOGY SECTION

1. General information

Form of admissions test

A written test

Duration of the admissions test

90 minutes

The content and structure of the admissions test

This admissions test in Management and Business English evaluates comprehensive verbal, mathematical, logical and analytical skills and abilities acquired by the applicants during their previous training and necessary for master's studies in the main field of study 38.04.02 "Management".

This admissions test is held in the form of testing and consists of two parts: **the Quantitative Section** (20 assignments) and **the Verbal Section** (20 assignments). The test is held in the written form in English. Each assignment includes five answer choices. The applicants must choose the correct one.

2. Guidelines

2.1. To answer the *problem solving* questions in the **Quantitative Section**, the applicants need to demonstrate their basic math skills; understanding of the elementary mathematical notions; ability of quantitative reasoning and quantitative problem-solving.

2.2. To answer the *data sufficiency* questions, in the **Quantitative Section**, the applicants need to be able to: analyse quantitative problems; define what information is necessary to make the right decision; define the volume of sufficient information for correct problem-solving.

2.2.1. Data sufficiency questions consist of assignment formulation and two statements marked (1) and (2). The applicant must decide if the given information is sufficient to answer the question. The applicant must choose between the following answers:

- if you can get the answer from (1) ALONE but not from (2) alone;
- if you can get the answer from (2) ALONE but not from (1) alone;
- if you can get the answer from BOTH (1) and (2) TOGETHER, but not from (1) alone or (2) alone;
- if EITHER statement (1) ALONE OR statement (2) ALONE suffices;
- if you CANNOT get the answer from statements (1) and (2) TOGETHER, but need even more data.

2.3. To choose the right answer in *reading comprehension questions* in the **Verbal Section** the following is needed.

- To be able to understand the words and statements in the text. Questions of such type reveal general comprehension of the text as well as the understanding of particular terms used in it.

- To be able to understand the logical relationships between the main points and concepts of the text. Questions of such type demand the applicant to define strengths and weaknesses of an argument and evaluate the weight of this argument in the text.
- To be able to draw conclusions from the facts and statements in the text. Questions of such type reveal the ability to consider factual statements or information and use it to draw a general conclusion.
- To be able to understand and analyse quantitative information given in the text. Questions of such type reveal the ability to interpret numerical data or use simple arithmetic to draw conclusions concerning the material given in the text.

2.4. To give the correct answers on the *critical reasoning questions* in the **Verbal Section**, the applicants must understand the following basic principles:

- Principles of reasoning construction. Questions of such type demand the applicant to understand the logical structure of reasoning: conclusions drawn correctly, substantiated reasons, substantiated hypotheses or parallels between the reasons of similar structure.
- Principles of reasoning validity evaluation. These questions include reasoning construction analysis, study of the factors that can confirm or contradict this reason, finding mistakes in reasoning construction or methods of its validation.

2.5. To choose the right answer in *sentence correction questions* in the **Verbal Section** the following is needed:

- An ability to choose a grammatically correct phrase. A correct sentence must correspond to all of the rules of written English. E.g. the subject and the predicate must be coordinated, the tenses must be chosen correctly as well as pronouns' case. A correct sentence cannot contain incongruent adverbial phrases, incorrectly used idioms, mistakes in parallel structures.
- An ability to choose a stylistically correct phrase. A stylistically correct sentence expresses an idea clearly and briefly. It does not mean that a sentence with the smallest number of words and simplest vocabulary will contain the correct answer. It means the correct answer has no words without any meaning and complex structures making comprehension complicated. Moreover, a correct sentence includes words in their right meaning and in the right context.

List of competences the applicants must have

- Understanding of elementary mathematical notions;
- Ability of quantitative reasoning;
- Analyse quantitative problems;
- Define what information is necessary to make the right decision;
- Define the volume of sufficient information for correct problem-solving;
- To be able to understand the logical relationships between the main points and concepts of the text;
- To be able to draw conclusions from the facts and statements in the text ;

- To be able to understand and analyse quantitative information given in the text;
- Understand principles of reasoning construction;
- Understand principles of reasoning validity evaluation;
- To be able to choose a grammatically correct phrase;
- To be able to choose a stylistically correct phrase;

SECTION IV. ADMISSIONS TEST EVALUATION CRITERIA

1. Regulations for testing results evaluation

1.1. Each question of the test is evaluated in accordance with the following:

- the right answer: 2,5 points;
- the wrong answer: 0 points.

1.2. The maximum score for this admissions test is 100 points, the minimum score is 0 points.

2. On grounds of a personal application, the results of the international certified Graduate Management Admissions Test (GMAT) submitted by the applicant may be considered as the results of the admissions test in Management and Business English. (*See Regulations for Admission at SPbU in 2018*).