

**АВТОНОМНАЯ НЕКОММЕРЧЕСКАЯ ОРГАНИЗАЦИЯ  
ДОПОЛНИТЕЛЬНОГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ  
«НАУЧНО-ОБРАЗОВАТЕЛЬНЫЙ ЦЕНТР ВОЗДУШНО-  
КОСМИЧЕСКОЙ ОБОРОНЫ «АЛМАЗ – АНТЕЙ»  
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**УТВЕРЖДАЮ**

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**«НОЦ ВКО «Алмаз – Антей»**

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**ПРОГРАММА  
ВСТУПИТЕЛЬНЫХ ИСПЫТАНИЙ ПО АНГЛИЙСКОМУ ЯЗЫКУ  
ДЛЯ ПОСТУПАЮЩИХ В АСПИРАНТУРУ**

Научная специальность: 5.2.2. «Математические, статистические и  
инструментальные методы в экономике»

## Основные положения

Программа вступительного испытания в аспирантуру по дисциплине «Иностранный язык» составлена в соответствии с требованиями приказа Министерства науки и высшего образования Российской Федерации от 06.08.2021 № 721 «Об утверждении Порядка приема на обучение по образовательным программам высшего образования - программам подготовки научных и научно-педагогических кадров в аспирантуре», концептуальными положениями системы разноуровневой подготовки по иностранному языку для неязыковых специальностей.

**Цель вступительного испытания** – определить уровень знаний английского языка и уровень практического владения всеми видами иноязычной речевой деятельности, включая межкультурное общение на английском языке.

В ходе вступительного испытания должно быть продемонстрировано:

- владение навыками чтения и перевода аутентичных текстов научно-профессионального характера на английском языке с целью понимания содержания, а также адекватной передачи смысла иноязычных текстов научно-профессиональной направленности с соблюдением норм русского языка;
- владение навыками чтения и перевода текстов общего характера на английском языке с целью понимания содержания, а также адекватной передачи смысла иноязычных текстов на русском или английском языке;
- владение речевым этикетом и основами публичной речи в беседе общего характера в диалоговой форме, т.е. умение беседовать на английском языке с соблюдением речевых, стилистических и этических норм английского языка.

### Форма и порядок проведения вступительного испытания

Вступительное испытание по английскому языку проводится в форме экзамена и включает три этапа:

- **первый этап** – перевод в течение 35 минут со словарем текста, включающего терминологию в соответствии с выбранной научной специальностью, объемом 1500 – 1800 печатных знаков, чтение на английском языке данного текста;
- **второй этап** – пересказ на русском или английском языке основного содержания текста объемом 1200 – 1500 печатных знаков (текст общего содержания);
- **третий этап** – беседа с экзаменатором на английском языке по вопросам:
  - автобиография (возраст; месяц и год рождения; род занятий; хобби)
  - причина обучения в аспирантуре.

Решения экзаменационной комиссией принимаются на закрытых заседаниях простым большинством голосов членов комиссии. При равном числе голосов голос председателя является решающим. Общее число членов экзаменационной комиссии вместе с председателем не должно превышать четырех человек. В качестве членов экзаменационной комиссии возможно привлечение преподавателей вузов-партнеров, а также квалифицированных работников предприятий.

Прием экзамена оформляется протоколом, в котором фиксируются вопросы экзаменаторов к поступающему. Протокол приема экзамена подписывается председателем и членами экзаменационной комиссии, присутствующими на экзамене. Протокол приема вступительного испытания после утверждения хранится в личном деле поступающего. На каждого поступающего ведется отдельный протокол.

Пересдача экзамена, в том числе с целью повышения оценки не допускается. Сданный экзамен действителен в течение календарного года.

### **Критерии оценки результатов испытания:**

Уровень знаний поступающего оценивается экзаменационной комиссией по каждому этапу вступительного испытания по пятибалльной шкале. Критерии оценки: *оценка «пять» (отлично); оценка «четыре» (хорошо); оценка «три» (удовлетворительно); оценка «два» (неудовлетворительно).*

#### ***Критерии оценки за первый этап вступительного испытания:***

- *оценка «пять» (отлично)* экзаменуемый полностью понял оригинальный текст (включающий терминологию в соответствии с выбранным направлением подготовки). Он использовал при этом все известные приемы, направленные на понимание прочитанного (смысловую догадку, анализ). Скорость чтения текста может быть несколько замедленной по сравнению с той, с которой экзаменуемый читает на родном языке;

- *оценка «четыре» (хорошо)* экзаменуемый полностью понял основное содержание оригинального текста. Однако у него недостаточно развита языковая догадка, отсутствует навык анализа основного смысла незнакомых слов из контекста, а темп чтения более замедлен;

- *оценка «три» (удовлетворительно)* экзаменуемый понял текст не полностью, не владеет приемами его смысловой переработки, затрудняется в понимании общего смысла предложений, не развита языковая догадка, чтение текста на английском языке вызывает затруднение (паузы, сбитый темп и т.п.);

- *оценка «два» (неудовлетворительно)* экзаменуемым не выполнены условия, позволяющие поставить оценку «удовлетворительно».

#### ***Критерии оценки за второй этап вступительного испытания:***

- *оценка «пять» (отлично)* экзаменуемый полностью понял оригинальный текст и смог пересказать его содержание на английском языке;

- *оценка «четыре» (хорошо)* экзаменуемый полностью понял оригинальный текст и смог пересказать его содержание на русском языке;

- *оценка «три» (удовлетворительно)* экзаменуемый понял текст не полностью, пересказ его содержания на русском языке вызвал у него затруднения (в пересказе допущены фактологические ошибки);

- *оценка «два» (неудовлетворительно)* экзаменуемым не выполнены условия, позволяющие поставить оценку «удовлетворительно».

***Критерии оценки за третий этап вступительного испытания:***

- **оценка «пять» (отлично)** экзаменуемый в целом справился с поставленными речевыми задачами. Его ответ был связным и логически последовательным. Диапазон используемых языковых средств достаточно широк. Языковые средства были правильно употреблены, практически отсутствовали ошибки, нарушающие коммуникацию, или они были незначительны. Полнота высказывания соответствовала требованиям задания;

- **оценка «четыре» (хорошо)** экзаменуемый в целом справился с поставленными речевыми задачами. Его ответ был связанным и последовательным. Использовался большой объем языковых средств, которые были употреблены правильно. Однако были сделаны отдельные ошибки, нарушающие коммуникацию. Темп речи был несколько замедлен;

- **оценка «три» (удовлетворительно)** экзаменуемый сумел, в основном, решить поставленную речевую задачу, но диапазон языковых средств был ограничен, ответ был не полным, допускались языковые ошибки, нарушалась последовательность высказывания;

- **оценка «два» (неудовлетворительно)** экзаменуемым не выполнены условия, позволяющие поставить оценку «удовлетворительно».

Тексты для подготовки к вступительному испытанию  
(1 этап)

**Текст 1. How Are Statistics Used in Economics and Finance?**

Economists collect and look at all sorts of data, ranging from consumer spending to housing starts to inflation to GDP growth. In finance, analysts and investors collect data about companies, industries, sentiment, and market data on price and volume. Together, the use of inferential statistics in these fields is known as econometrics. Several important financial models from CAPM to Modern Portfolio Theory (MPT) and the Black-Scholes options pricing model, rely on statistical inference.

The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk, or the general perils of investing, and expected return for assets, particularly stocks. CAPM evolved as a way to measure this systematic risk. It is widely used throughout finance for pricing risky securities and generating expected returns for assets, given the risk of those assets and cost of capital.

The modern portfolio theory (MPT) is a practical method for selecting investments in order to maximize their overall returns within an acceptable level of risk. A key component of the MPT theory is diversification. Most investments are either high risk and high return or low risk and low return.

The Black-Scholes model, also known as the Black-Scholes-Merton (BSM) model, is one of the most important concepts in modern financial theory. This mathematical equation estimates the theoretical value of derivatives based on other investment instruments, taking into account the impact of time and other risk factors. Developed in 1973, it is still regarded as one of the best ways for pricing an options contract.

## **Текст 2. What Is an Optimization?**

Optimization is the process of making a trading system more effective by adjusting the variables used for technical analysis. Broadly speaking, optimization is the act of changing an existing process in order to increase the occurrence of favorable outcomes and decrease the occurrence of undesirable outcomes. This can be used to make a business model more profitable, increase the expected returns on an investment portfolio, or decrease the expected costs of a trading system.

Each optimization depends upon a certain number of assumptions about real-world variables. For example, an investor seeking to optimize their portfolio would begin by assessing factors such as market risk and the likelihood that certain investments may outperform others. Since there is no way to calculate these variables in real time, the investor's optimization strategy would depend upon how well they estimate these factors.

There may be multiple paths to optimization, depending on the assumptions underlying an optimization strategy. Some traders might optimize their strategy with a number of short-term trades to take advantage of predictable price swings. Others might optimize by reducing the number of trades in order to reduce their transaction costs. In either case, the success of an optimization strategy will depend on how well the investor has identified the risks, costs, and potential payouts of their strategy.

An interesting example of business optimization occurs in supply chain management, the industry concerned with the large-scale transportation and storage of trade goods around the world. In order to keep operations running smoothly, most industrial enterprises rely upon a large network of logistics providers and suppliers to keep their factories running.

Beginning in the 1970s, companies like Toyota began optimizing their inventory systems with just in-time production. By manufacturing and delivering items as they were needed, this system allowed manufacturers to reduce the costs associated with storage and warehousing.

## **Текст 3. What Is Econometrics?**

Econometrics is the use of statistical and mathematical models to develop theories or test existing [hypotheses](#) in economics and to [forecast](#) future trends from historical data. It subjects real-world data to statistical trials and then compares the results against the theory being tested.

Depending on whether you are interested in testing an existing theory or in using existing data to develop a new hypothesis, econometrics can be subdivided into two major categories: theoretical and applied. Those who routinely engage in this practice are commonly known as econometricians.

The first step to econometric methodology is to obtain and analyze a set of data and define a specific hypothesis that explains the nature and shape of the set. This data may be, for example, the historical prices for a stock index, observations collected from a survey of consumer finances, or unemployment and inflation rates in different countries.

If you are interested in the relationship between the annual price change of 500 leading U.S. publicly traded companies and the unemployment rate, you'd collect both

sets of data. Then, you might test the idea that higher unemployment leads to lower stock market prices. In this example, stock market price would be the dependent variable and the unemployment rate is the independent or explanatory variable.

The most common relationship is linear, meaning that any change in the explanatory variable will have a positive correlation with the dependent variable. This relationship could be explored with a simple regression model, which amounts to generating a best-fit line between the two sets of data and then testing to see how far each data point is, on average, from that line.

Note that you can have several explanatory variables in your analysis—for example, changes to GDP and inflation in addition to unemployment in explaining stock market prices. When more than one explanatory variable is used, it is referred to as multiple linear regression. This is the most commonly used tool in econometrics.

#### **Текст 4. What is Mathematical Economics?**

Mathematical economics is a method of economics that utilizes math principles and tools to create economic theories and to investigate economic quandaries. Mathematics permits economists to construct precisely defined models from which exact conclusions can be derived with mathematical logic, which can then be tested using statistical data and used to make quantifiable predictions about future economic activity.

The marriage of statistical methods, mathematics, and economic principles enabled the development of econometrics. Advancements in computing power, big data techniques, and other advanced mathematics applications have played a large part in making quantitative methods a standard element of economics.

Mathematical economics relies on defining all the relevant assumptions, conditions, and causal structures of economic theories in mathematical terms. There are two main benefits from doing this. First, it allows economic theorists to use mathematical tools such as algebra and calculus to describe economic phenomena and draw precise inferences from their basic assumptions and definitions. Second, it allows economists to operationalize these theories and inferences so that they can be tested empirically using quantitative data and, if validated, used to produce quantitative predictions about economic matters for the benefit of businesses, investors, and policymakers.

From Main Street to Wall Street to Washington, decision-makers have become accustomed to hard, quantitative predictions about the economy due to the influence of mathematical economics. When setting monetary policy, for example, central bankers want to know the likely impact of changes in official interest rates on inflation and the growth rate of the economy. It is in cases like this that economists turn to econometrics and mathematical economics.

#### **Текст 5. What Is Statistics?**

Statistics is a branch of applied mathematics that involves the collection, description, analysis, and inference of conclusions from quantitative data. The mathematical theories behind statistics rely heavily on differential and integral calculus, linear algebra, and probability theory.

Statisticians, people who do statistics, are particularly concerned with determining how to draw reliable conclusions about large groups and general events from the behavior and other observable characteristics of small samples. These small samples represent a portion of the large group or a limited number of instances of a general phenomenon.

The two major areas of statistics are descriptive and inferential statistics.

Statistics can be communicated at different levels ranging from non-numerical descriptor (nominal-level) to numerical in reference to a zero-point (ratio-level).

A number of sampling techniques can be used to compile statistical data including simple random, systematic, stratified, or cluster sampling.

Statistics are present in almost every department of every company and are an integral part of investing as well.

Statistics is prominent in finance, investing, business, and the world. Much of the information you see and the data you are given is derived from statistics, which are used in all facets of a business. In *investing*, statistics include average trading volume, 52-week low, 52-week high, beta, and correlation between asset classes or securities. In *economics*, statistics include GDP, unemployment, consumer pricing, and inflation, and other economic growth metrics. In *marketing*, statistics include conversion rates, click-through rates, search quantities, and social media metrics. In *accounting*, statistics include liquidity, solvency, and profitability metrics across time. In *information technology*, statistics include bandwidth, network capabilities, and hardware logistics. In *human resources*, statistics include employee turnover, employee satisfaction, and average compensation relative to the market.

Тексты для подготовки к вступительному испытанию  
(2 этап)

**Text № 1 Newspapers**

Newspaper is a publication that presents and comments on the news. Newspapers play an important role in shaping public opinion and informing people of current events. The earliest daily newssheet was "Acta Diurna" ("Daily Events") which started in Rome in 59 B.C. The first printed newspaper was Chinese publication called "Dibao" ("Ti - pao") started in A.D. 1422. It was printed from carved wooden blocks. The first regularly published newspaper in Europe was "Avisa Relation" or "Zeitung", started in Germany in 1609. Newspapers have certain advantages over other mass media. Newspaper can cover more news and in much detail than TV or radio newscast can do. Magazines focus on major events of the preceding week. But newspaper focuses on local news as well and provides information and comments faster than magazine can do.

There are about 1 700 daily and 7 500 weekly newspapers in the US. The circulation of some weeklies is no more than a few hundred of copies per issue and the circulation of some dailies is over a million of copies. There are daily newspapers and weekly newspapers. Daily newspapers print world, national and local news. Sunday issues of the dailies are usually larger than the weekday ones. They may include special sections on such topics as entertainment, finance and travel or Sunday magazine, a guide to TV programmes. The major dailies in the US are "Christian Science Monitor",

"New York Times", "USA Today", "Wall Street Journal", "Washington Post". Weekly newspapers serve usually for smaller areas. They are printed in small communities where people are interested in activities in the neighborhood. Weeklies report of weddings, births, deaths and news of local business and politics.

### **Text № 2 Newspaper Reporting**

The newspaper printing is a rather unusual activity since each day the newspaper material is prepared anew. Newspaper includes editorial board work the following functions: getting the right news, writing articles, selection of the best items for the print, and printing itself. Journalists, editors and rewriters, photographers and make-up editors responsible for the issue of the paper perform all these tasks. Thus, the newspaper reporting starts with collecting information for the paper. However, journalism doesn't stop here. Newspapers and magazines publish many stories - news items, political stories, humor stories and other. Such articles may be called human interest stories. Besides, newspapers carry many items on sports, personalities of today, stories on science, art and hi-tech. Rather popular are also the reports about the flights of astronauts and space research matters in general.

Human interest stories are often written as an interview, or as some journalists say, a "profile" is given. It is no secret that different newspaper publications differently influence the reader, this depending on the level of the skill of the journalist himself or the type of the topic being covered. Some unexperienced reporters often ask the question: 'how to conduct an interview?' There are hardly any rules because each interviewee is different. In most instances, the journalist's problem is how to get the interviewee to start talking. The opening questions has special importance. The reporter should not ask questions that call for only yes-or- no response. Another problem is how to keep on talking. These profile-type stories may be characterized as "personality sketches" reading which one learns much about interesting aspects of somebody's life.

### **Text № 3 Books in Our Life**

Nowadays it's impossible to imagine our life without books. Perhaps, there are more books on our planet than men alive. Long before the invention of printing people valued books as treasure troves of the human knowledge and experience. Hand-written manuscripts took months of writing and were collected by and kept in monasteries with utmost care. We can distinguish books between three classes of them. Firstly, books on different branches of knowledge, works by brilliant minds of mankind. Secondly, textbooks, reference books and numerous dictionaries. And at last, books of all kinds and genres to read at leisure.

Classics should be taken a little at a time. One's understanding of books by Tolstoy and Dostoyevsky, Mopassan and Balzak depends on one's age and experience. Serious books are to be read conscientiously and maybe more than once. To a thinking reader they will provide new food for thought every time he rereads it. Many people indulge in reading science fiction, fantasy or detective stories. Of course, there are some advantages and disadvantages of this kind of literature, often referred to as "easy reading". As for me, good science fiction and fantasy develop imagination, logical thinking and broader one's outlook. The same could be said about detective stories. The masterpieces of this genre by Sir Arthur Conan Doyle, Agatha Christie and others,

show the depths of psychological analysis, the insight into the human nature. As an old saying goes, man cannot live on bread alone.

Books are the source of knowledge and the means of self-perfection. Sometimes it is difficult to solve some problems in life. I think that books can help us. Books must be our friends during all our life.

#### **Text № 4 My Favourite English Writer**

It's said that none of the British writers of our age enjoyed such popularity all over the world as Agatha Christie did. Her works were translated into many languages, and scores of films were made using them as the script. The name of Agatha Christie is a synonym for high-class detective story. According to Agatha Christie herself, she began to write just to imitate her sister whose stories had already been published in magazines. And suddenly Agatha Christie became famous. Having lost her father at an early age, the prospective writer didn't receive even fairly good education. During the First World War she was a nurse, then she studied pharmacology. Twenty years later she worked in a military hospital at the beginning of the Second World War. The favourite personages of the "queen of detective story" are the detective Hercule Poirot and the sedate Miss Marple. The composition of her stories is very simple: a closed space with a limited number of characters, who are often plane or train passengers, tourists, hotel guests or residents of a cosy village. Everyone is suspected! Murders in the books of Agatha Christie are committed in most unsuitable places: in the vicar's garden or in an old abbey; corpses are found in someone's libraries being murdered with the help of tropical fishes, a poker, candelabra, a dagger or poison.

Once Agatha Christie wrote: "Some ten years will pass after my death, and nobody will even remember me..." The writer was wrong. Agatha Christie's novels are very popular now. People of all continents read and reread "The Oriental Express", "Ten Little Negroes", "The Bertram Hotel", "The Corpse in the library" and other of her novels time and again, enjoy films made by her works, and one can hardly find a country where people do not know her name.

#### **Text № 5 Shopping**

When we want to buy something, we go to a shop. There are many kinds of shops in every town or city, but most of them have a food supermarket, a department store, men's and women's clothing stores, grocery, a bakery and a butchery.

I like to do my shopping at big department stores and supermarkets. They sell various goods under one roof and this is very convenient. A department store is composed of many departments: readymade clothes, fabrics, shoes, sports goods, toys, china, glass, electric appliances, cosmetics, linen, curtains, cameras, records, etc. You can buy everything you like there. There are also escalators in big stores which take customers to different floors. The things for sale are on the counters so that they can be easily seen. There are the women's clothing department, the men's clothing department, the knitwear department and the perfumery.

In a food supermarket we can buy many different things at once: sausages, fish, sugar, macaroni, flour, cereals, tea. At the butcher's there is a wide choice of meat and poultry. At the bakery you buy brown and white bread, rolls, biscuits. Another shop we frequently go to is the green grocery which is stocked by vegetables. Everything is sold here ready-weighed and packed. If you call round at a dairy you can buy milk,

cream, cheese, butter and many other products.

The methods of shopping may vary. It may be a self-service shop where the customer goes from counter to counter selecting and putting into a basket what he wishes to buy. Then he takes the basket to the check-out counter, where the prices of the purchases are added up. If it is not a self-service shop, and most small shops are not, the shop assistant helps the customer in finding what he wants. You pay money to the cashier and he gives you back the change.

### **Text № 6 The Hermitage**

One of the world-wide known museums is the Hermitage. The word "Hermitage" means "a place of solitude". This name was given in the XVIII century by Catherine II to her private museum housed in a small building adjacent to the Winter Palace and accessible only to the chosen few. In the course of time, the Hermitage grew into one of the greatest museums of the world. At the present, the collections take up five interconnected buildings. The museum retains its old name. The accumulation of artifacts led to the formation of new departments devoted to the culture and art of the Peoples of the East, of the Prehistoric culture, and of the Russian culture. Three other departments are those of Western European art, classical antiquities and numismatics. One of the rooms that impressed visitors the most is St. George Hall. The interior of the room is considered by experts to be a perfect example of the Classical Style. The room covers about 800 square meters, but does not seem enormous due to perfect proportions. It is decorated in the whitest marble and gilded bronze. The Throne Hall was used for column assemblies. Members of the Tzar's family, when coming of age, took their oaths here. The Leonardo da Vinci Hall is one of the most gorgeous interiors. The hall is decorated in the style of 17-century French Baroque. The Hermitage possesses two, out of 12 or 14 works surviving from Leonardo. The Rembrandt collection is one of the most treasured possessions of the museum. It contains 24 canvases.

The Malachite Room reflects the style of 1889. The columns, pilasters, and floorlamps are veneered with thin plaques of rich green malachite. About two tons of malachite were used in decoration of the room.

### **Text № 7 Christmas**

Christmas is a Christian holiday that celebrates the birth of Jesus Christ. For millions of Christians throughout the world it is the happiest and the busiest time of the year. No one knows the exact date of Christ's birth but most Christians celebrate Christmas on December 25. People of different countries celebrate Christmas in various ways. People in the United States and Canada decorate their homes with Christmas trees, wreaths and ornaments. City streets are filled with colored lights; the sound of bells and Christmas carols can be heard everywhere.

Children write letters to Santa Claus and tell him what presents they would like to get. People send Christmas cards to relatives and friends. Many companies give presents to their employees. A Christmas tree is one of the main symbols of Christmas. Relatives and friends may join in trimming the tree with lights, tinsel, and colorful ornaments. Presents are placed under the tree. On Christmas Eve, families open their presents. Many children believe that Santa Claus arrives on Christmas Eve in a sleigh pulled by reindeer and brings presents. Some children hang up stockings so Santa Claus

can fill them with candy, fruit and other small gifts. In many parts of the United States and Canada groups of people walk from house to house and sing Christians carols. Some people give singers money or small gifts or invite them for a warm drink. Many people attend church services on Christmas Eve or Christmas morning.

They listen to readings from Bible and singing Christmas carols. A traditional Christmas dinner consists of stuffed turkey, mashed potatoes, cranberry sauce and a variety of other turkey. Pumpkin pie, plum pudding, and fruitcake are favourite desserts dishes.

### **Text № 8 The History of the Olympic Games**

Ancient Greeks often waged wars. Small states suffered and lost much even if they did not take any side and stayed out of wars. The ruler of such a small state, Elis, wanted to live in peace with all neighbours. He was a good diplomat because his negotiations were successful and Elis was recognized a neutral state. To celebrate this achievement, he organized athletic games. In the beginning this feast lasted one day, but later a whole month was devoted to it. All wars were stopped by special heralds who rode in all directions of Greece. The games were held every four years in Olympia on the territory of Elis. The first games which later were called the Olympic Games were held about a thousand years before our era. Usually the Olympic Games began before the middle of the summer. Best athletes arrived from many Greek states to Olympia to compete in running, long jumps, throwing of discus and javelin and wrestling. In the course of time fist fighting (boxing) and chariot races were also included in the Games. All athletes took an oath that they had been preparing, well for the Games and promised to compete honestly and keep the rules of the sacred Olympics. Winners were called "olympionics", they were awarded olive wreaths and cups of olive oil. The olympionics of ancient Greece became very popular. Best craftsmen were chosen to make honorary cups, many poets wrote and recited in public poems about the best athletes.

Only men could take part in the Olympic Games. Women were not allowed even to watch the competitions at the stadium under the fear of death penalty. There was a single exception, when a woman coached her son and accompanied him to the stadium in men's clothes. That brave woman was spared the penalty because her son excelled in many events.

### **Text № 9 Space Exploration**

Mankind always dreamed of overcoming gravitation and reaching other planets. But it was only in the 1960-es that this dream was to become reality. On the 12th of April 1961 the spaceship "Vostok" was launched into space with a man on board and after orbiting our planet successfully returned to the Earth. The first man to overcome gravitation and orbit the Earth was Yuri Gagarin. This day went down in history of mankind as an outstanding achievement, opening the space era.

In the course of space exploration there have been lots of achievements of world science and technology. This period saw the launching of many earth satellites, numerous space laboratories. Among the achievements we may enumerate the landing of automatic stations on the Moon, the flights of space laboratories towards the Venus and Mars. These are the years of manned space flight programmes: Valentina Tereshkova was the first woman-cosmonaut to make a space flight, A. A. Leonov achieved the first "space walk" in 1965, the first Soviet experimental station with four

cosmonauts on board went into orbit, the first American expedition landed on the Moon. The Soviet "Lunokhod", automatic orbital stations "Soyuz" and other space laboratories opened up a new period of space exploration. From the first experiments scientists went over to systematic exploration of space. Recently there have been calls to reduce expenditure on space research programmes. I think it would be a serious mistake to allow this to happen. There is a direct link between the development of space research programmes and different earth technologies. The higher the former are the more developed the latter are.

### **Text № 10 Biorhythms**

At the beginning of this century medical scientists made a surprising discovery: that we are built not just of flesh and blood but also of time. They were able to demonstrate that we all have an internal "body clock" which regulates the rise and fall of our body energies, making us different from one day to the next. The idea of an internal "body clock" should not be surprising, since the lives of most living things are dominated by the 24-hour night-and-day cycle. The most obvious feature of this cycle is the way we fall asleep at night and become awake during the day. If the 24-hour rhythm is interrupted, most people experience unpleasant side effects. As well as the daily rhythm of sleeping and waking we also have other rhythms which last longer than one day and which influence wide areas of our lives.

Most of us would agree that we feel good on some days and not so good on others. Scientists have identified the following three biorhythmic cycles: physical, emotional and intellectual. Each cycle lasts approximately 28 days and each is divided into a high energy period and a low energy period of equal length. During the low energy period we are less resistant to illness and tire more easily. The low period puts energy into our "batteries" for the next high period.

During the high energy period of a physical biorhythm we are more resistant to illness and more energetic. The weakest time is the time of changeover from the high energy period to the low energy period, or vice versa. This weakest time usually lasts a day. On the weakest day of a physical biorhythm, there is a greater chance of accident and illness. Human experience is always individual. Some people experience such enormous physical turbulence on their "physically critical" days that they have to go to bed.

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