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OCCUPATIONAL SAFETY AND HEALTH

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The basic technique for practical study disciplines, particularly the dangerous and harmful factors artificially created environment, characterize biological hazards, influence weather and meteorological factors on the status and human performance, typical models of physiological reactions of people in case of emergencies, man-made hazards and their consequences .

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Introduction

Safety and life – a branch of scientific knowledge that covers an extremely wide range of issues that are closely related to the physical, chemical, biological, health sciences and engineering.

Further development of the Ukrainian state assumes an active role professionally trained, educated and erudite specialists with knowledge and humanitarian outlook in various aspects of modern society, including the problems of its security.

Discipline "Safety and life" is a leader in structural and logical scheme of training in the educational degree "bachelor", as is a discipline that uses achievements and methods of basic and applied sciences of philosophy, biology, physics, chemistry, sociology, psychology ecology, economics, management, etc., and allows graduates to solve professional tasks for a certain degree of the risk of internal and external threats that cause emergencies and their consequences.

The purpose of the discipline is gaining student competencies, knowledge and skills for professional activity on the specialty, taking into account the risk of industrial accidents and natural hazards that can cause emergency situations and lead to adverse effects on facilities management, as well as the formation of student responsibility for individual and collective security.

Objectives of the discipline involves the mastery of knowledge, skills and ability to solve professional tasks obligatory account industry requirements for the safety of personnel and protection in hazardous and emergency situations.

Mastered discipline "Safety" future bachelors (junior specialist) should have a set of comprehensive and professional competencies for life safety in their respective areas of professional training to address problems associated with guaranteeing the health care staff in the CO and emergency conditions dangerous situations.

The proposed guidelines should help teachers and students in the study of this discipline, to form a preventive way of thinking and professional work of the future expert

The paper contains basic techniques that allow practical course to learn safety and life, as the complex relationships in the system "man-living environment" at various levels. Special attention is paid to the person of physiological and psychological characteristics. Practice includes guidelines, tests, aimed at in-depth study of the properties of the human psyche, types of human temperament and behavior that contribute to a better understanding of theoretical material. Shows quantitative characteristics of threats, including anthropogenic, specific methods and ways to prevent or reduce their negative effects.

General principles of occupational safety and life safety

1.1. Scientific principles of creating life safety

According to modern ideas, ***life safety*** is a field of knowledge that studies the dangers that threaten a person in everyday life (at home, on the street, at work, on vacation) and in emergencies (accidents, man-made and natural disasters, etc.) and methods of protection from them[1].

As a complex category, it covers human life and activities in interaction with the environment (natural and artificial). Undoubtedly, the safety of life today is a multifaceted object of understanding and perception of reality, which requires the integration of different strategies, areas, aspects, forms and levels of knowledge. The components of this field are various security sciences that have a worldview and professional nature:

- humanities (philosophy, theology, linguistics);
- natural sciences (mathematics, physics, chemistry, biology);
- engineering sciences (resistance of materials, engineering, electronics);
- human sciences (medicine, psychology, ergonomics, pedagogy);
- social sciences (sociology, economics, law).

LS accumulates those achievements that allow an individual to realize their potential without harming himself or herself, the environment or society.

The purpose of LS education is to prepare a person for active participation in ensuring a long and full life in a dynamically changing society. According to the main tasks of such education are:

- formation of human culture concerning security, its moral values, views, behavior, etc;
- ensuring a certain state of individual security through the formation and development of those qualities of a person that contribute to the development of security, as well as the necessary knowledge and skills;
- intensification of methodical, scientific and other forms of educational work in the direction of BJD both in educational institutions and outside them;
- assistance in improving the efficiency of the state system for public safety by educating and preparing people for their adequate interaction, active position on improving the state system, including the legislative sphere;
- improving the management of education of all segments of the population according to the criteria of the direction of BJD.

The object of the educational direction of BJD is considered to be the safety of the person as a phenomenon, and *the subject* - safety models. Thus, such education prepares a person for a full life with active participation in ensuring the level of security that depends on the environment (environment, life, transport, leisure, production, social relations, etc.); the state system of support of human security (fire protection, law enforcement agencies, civil defense, labor protection, health protection, etc.) and individual protection of the person (psychological state, motivation, skills, individual means of protection, etc.).

1.2. Fundamentals of labor protection legislation

The Verkhovna Rada of Ukraine adopted the Law of Ukraine “On Labor Protection” (as amended by Law № 229-IV of November 21, 2002 - BBP. -2003. - № 2. - Article 10). [9,10].

This Law defines the basic provisions for the implementation of the constitutional right of employees to have a protection of their life and health in the process of work, appropriate, safe and healthy working conditions, regulates with the participation of relevant public authorities relations between employer and employee on safety, occupational health and production environment and establishes a single procedure for the organization of labor protection in Ukraine.

According to Art. 1 of the Law of Ukraine "On labor protection" there are certain concepts and terms.

Occupational Health − it is a system of legal, socio-economic, organizational-technical, sanitary-hygienic, treatment-and-prophylactic measures and means aimed at preserving human life, health and ability to work in the process of labor activity.

Employer − the owner of the enterprise, institution, organization or its authorized body, regardless of ownership, type of activity, management, and an individual who uses hired labor.

Employee − a person who works at an enterprise, organization, institution and performs duties or functions in accordance with the employment agreement (contract).

This Law applies to all legal entities and individuals who use hired labor in accordance with the law, and to all employees.

Legislation on labor protection consists of the Law "On labor protection", the Labor Code of Ukraine, the Law of Ukraine "On compulsory state social insurance against accidents at work and occupational diseases that caused disability" and adopted in accordance with their regulations. legal acts.

Labor protection contains three main components: legal norms of labor legislation in this area, industrial sanitation, hygiene and safety of production processes, as well as fire protection.

The purpose of labor protection − ensuring safe, harmless and favorable working conditions through the solution of many complex problems, the main of which are:

- design of enterprises, technological processes and design of equipment with mandatory compliance of labor protection requirements;
- finding the optimal ratio between the various factors of the production environment, which allows to ensure a minimum of adverse effects on the health of workers;
- establishment, legislative registration of certain norms of each of the unfavorable or dangerous factors, systematic control over their application;
- development of specific measures to improve working conditions and ensure their safety through the use in production of the latest advances in science and technology;

- the use of rational means of protection of workers from the effects of adverse factors of the production environment, as well as the implementation of organizational measures that neutralize or reduce the degree of their impact on the human body;

- development and application of methods and means of assessing the effectiveness of occupational safety measures, which are planned and implemented.

Successful solution of these problems involves the use of advances in science and technology, which directly or indirectly provide labor protection, in addition to socio-legal disciplines, and economics, technical aesthetics, engineering and social psychology, physiology. Assimilation of safety rules is based on deep knowledge of machines, mechanisms, production processes used in the tourist complex. Modern production requires that labor protection be based on scientific and technical basis. Increasing the level of mechanization and application of automation of production processes, which are the main means of technical progress, have not only economic but also social significance and meet the interests of workers. They greatly facilitate the work of workers, make it comfortable. To do this, the enterprises of municipal economy, energy, hotel and tourist complex and construction companies have great opportunities and reserves. The methodological basis of labor protection is a scientific analysis of working conditions, production and technological processes, production equipment, in terms of the possibility of dangerous harmful production factors. Based on this analysis, organizational, technical, sanitary, hygienic, socio-economic and other measures to prevent the effects of these factors on workers are developed[1,4].

1.2.1. Basic legislative acts on labor protection

The state policy of Ukraine on labor protection is based on the constitutional right of every citizen to appropriate safe and healthy working conditions and the priority of life and health of the employee in relation to the results of production activities. The implementation of this policy should ensure continuous improvement of working conditions and safety, reduction of injury and occupational diseases.

Ukraine has adopted and is implementing the National Program for Improving Occupational Safety, Health and the Working Environment, which was approved by the Cabinet of Ministers on October 10, 2001 (Order № 1320), on the basis of which sectoral and regional programs for improving occupational safety were developed.

On October 22, 2001, the Concept of Labor Protection Management № 432 was approved and implemented by the order of the Ministry of Labor, which defines the ways to reform the management of labor protection in Ukraine.

Ukraine has laws that define the rights and responsibilities of its residents, as well as the organizational structure of government and industry. The Constitution, the basic law of the state, was adopted by the Verkhovna Rada of Ukraine on June 28, 1996. It declares equal rights and freedoms to all residents of the country: free choice of work that meets safe and healthy conditions, rest, social protection in the case of disability and old age, and some others. All laws and regulations must be consistent, based on and consistent with the articles of the Constitution.

In the basic law of Ukraine - the Constitution, three articles are devoted to the issues of labor protection: 43, 45 and 46.

Article 43 of the Constitution declares, that everyone has the right to work, which includes the opportunity to earn a living by work which a person freely chooses or freely agrees to. Everyone has the right to safe and healthy working conditions, to a salary not lower than that prescribed by law. It is also emphasized that the use of women and adolescents in work which is dangerous to their health is prohibited.

Article 45 of the Constitution guarantees that employees have the right to rest by establishing annual basic and additional leave, providing mandatory weekly rest days, reduced working hours in hazardous conditions and night time

In the text of Article 46 of the Constitution it is about the right of citizens for social protection in case of complete or temporary disability, loss of breadwinner, unemployment, old age and other cases provided by law.

These articles of the Constitution are specified by the relevant legislative acts.

The general laws of Ukraine, which determine the basic provisions of labor protection are:

The Labour Code (LC)

Law of Ukraine "On labor protection" from 01.01.2003

The legal framework in the field of labor protection also includes the Laws of Ukraine:

"On compulsory state social insurance against accidents at work and occupational diseases that have caused disability",

"On compulsory social insurance in connection with temporary disability and expenses due to birth and burial",

"On health care",

"On fire safety",

"On the use of nuclear energy and radiation safety",

"On ensuring the sanitary and epidemic well-being of the population",

"On traffic"

1.3. Classification of sources of danger

Danger is seen as an objectively existing reality in the relationship between society and technology, the human environment. According to the Committee on Risk Perception and the National Research Council, the risk is "an action or phenomenon that causes potential harm to people or objects." According to the American researcher Wilhelm Marshall (1934-1996), this is a natural or man-made phenomenon, which can result in phenomena or processes that can affect people, cause material damage, destroy the environment and more[1,6].

Danger - 1) a negative property of living and inanimate matter, which can harm the matter itself: people, the environment, material values. **2)** it is a condition or situation that exists in the environment and can lead to unwanted release of energy, which can cause physical harm, injury and damage.

Dangers are identified with regard to the principle of "everything affects everything": the source can be all living and non-living, danger also threatens all living and non-living.

The science that deals with the classification of hazards is called taxonomy. Depending on the specific needs, hazard classifications are used according to different criteria:

- time of action (impulsive and cumulative);
- by localization (related to litho-, hydro, atmosphere and space);
- by consequences (disease, mortality, reduction of life expectancy, destabilization of society);
- by scale (global, state, regional, local);
- by sphere of manifestation (household, sports, industrial);
- by structure (simple and derivative);
- by origin (natural, man-made, socio-political, combined).

Most often used classification of sources of danger by origin. *Natural sources of danger* include natural objects, natural phenomena and natural disasters that threaten human life or health (earthquakes, landslides, volcanoes, storms, hurricanes, fogs, lightning, asteroids). *Man-made sources of danger* are associated with the use of vehicles, technical equipment, the use of combustible, flammable substances, various types of radiation. *Social sources of danger* include those caused by low spiritual and cultural levels: vagrancy, prostitution, alcoholism. *The sources of political dangers* are conflicts at the international level, political terrorism, and wars. *Combined sources* of danger are divided into the following subgroups:

- natural - man-made (smog, acid rain, reduced soil fertility);
- natural - social (drug addiction, epidemics, infectious diseases, sexually transmitted diseases);
- socially - technogenic (occupational diseases, occupational injuries)

All dangers are to some extent caused by striking (negative) factors. Depending on the effects of specific affecting factors on the human body, they are in some cases divided into harmful and dangerous.

Dangerous situation - an event in which there is a real opportunity manifestation of danger or danger is manifested

Dangerous factors - environmental factors that lead to injuries, burns, frostbite, other damage to the body or its individual organs and even sudden death.

Harmful factors - environmental factors that lead to deterioration of health, reduced efficiency, disease and more.

According to the nature and energy that they have, all factors are divided into the following groups: *physical; chemical; biological; psychophysiological*.

In addition to the above groups of harmful and dangerous factors, there is a *group of passive - active factors* - their action is manifested by human energy (sharp fixed objects; uneven or smooth surfaces, etc.); and a group of passive factors that affect a person indirectly through the degradation of the properties of materials (manifested in destruction, explosions, etc.).

Based on the approved State Sanitary Norms and Rules "Hygienic classification of labor on the indicators of harmfulness and danger of factors of the production environment, the severity and intensity of the labor process" (Order of 08.04.2014 № 248):

- dangerous production factor - a factor of the environment and labor process, which can cause acute illness (poisoning), sudden deterioration of health or death;
- harmful production factor - an environmental factor or labor process, the impact of which on the employee under certain conditions (intensity, duration of action, etc.) can cause occupational or industrial disease, temporary or permanent decline in efficiency, increase the frequency of somatic and infectious diseases, lead to health problems both the employee and his descendants;
- harmful working conditions - a state of working conditions in which the level of influence of one or more factors of the production environment and / or labor process exceeds the allowable.

1.3.1. Physical factors

The likelihood of avoiding harm to health increases dramatically if a person knows the specifics of the effects of dangerous and harmful physical factors on the body[5].

Physical impact factors – *these are environmental factors that can cause damage to the body, which can be caused by noise, vibration and other vibrations, non-ionizing and ionizing radiation, climatic parameters (temperature, humidity, air velocity, atmospheric pressure), insufficient light, high static electricity, etc.* .

All of them have a certain supply of energy, which is transmitted to man during interaction. The body is able to absorb energy only in the form of food. Other types of energy can be harmful. Despite the significant specificity of the action of various factors on the human body, it is believed that for the vast majority of them there is a certain threshold of insensitivity to the action of a factor.

Physical affecting factors are divided into subgroups: mechanical; thermal; electric; electromagnetic; nuclear.

Mechanical factors. They have a supply of kinetic or potential energy (all moving objects or moving elements of machines; objects and their elements that are above the ground, etc.), the transfer of which to the body causes injuries - fractures, tears, soft tissues , vascular. For example, when a person falls from a high-rise building, it is believed that he can physiologically withstand an impact at speeds up to 40 km / h.

Thermal factors. They are characterized by a certain reserve of thermal energy and anomalous temperature (heated and cooled objects, fire, climate and microclimate parameters, etc.). When transmitted to the human body, these objects and phenomena cause thermal burns to varying degrees.

When the skin is heated to a temperature of 44 0C, it is damaged and there are painful sensations, and when heated to a temperature of 77 0C, it is instantly destroyed. Harm to the body significantly depends on the area of the affected area of

the body. According to this parameter, thermal burns are divided into three groups: mild, moderate, severe.

Electrical factors. They have a supply of electric energy (electric current, electric field, electric charge, etc.). Electric current, passing through the human body, causes biological, electrochemical, thermal and mechanical effects.

The biological effect of electric current is manifested in the irritation and excitation of body tissues and is accompanied by convulsive muscle contraction and complete cardiac arrest. *Electrochemical action* determines the electrolysis (decomposition) of liquids, including blood, violating its composition. *Thermal action* leads to varying degrees of burns to certain parts of the body. *Mechanical* - to the stratification of tissues, as well as the separation of individual parts of the body. Electrical injuries are grouped into three groups: local, general, and mixed.

Electromagnetic factors. They are characterized by the energy reserve of electromagnetic waves, the magnitude of which depends on the length of the electromagnetic wave:

$$E = hv = hc\backslash \lambda \qquad (1.1)$$

where h is the Blank constant; v and λ – frequency and wavelength; c- speed of light.

Electromagnetic radiation is divided into 3 bands: radio frequency range (radio waves), optical (visible light, ultraviolet, infrared, laser), ionizing radiation range (X-ray and γ-radiation);

The degree of influence of electromagnetic radiation on the human body depends on the frequency range, intensity of exposure to relevant factors, duration of irradiation, nature of radiation, irradiation regime, size of the surface of the irradiated body and individual characteristics.

The main measures of protection against the effects of different types of radiation are: reduction of radiation at the source (introduction of new technologies); optimal placement of radiation sources (distance protection); reduction of stay time (protection by time); shielding of radiation sources; use of personal protective equipment.

Nuclear factors. These include natural and artificial radionuclides that have a supply of nuclear energy. Arbitrary decomposition of radionuclides is accompanied by corpuscular and photon radiation. The corpuscular radiation includes: α -, β - particles, neutrons, protons, etc. Photon radiation consists of γ- rays.

Due to the action of ionizing radiation on the human body, complex physical and biological processes can occur in tissues. Ionization of living tissue results in the rupture of molecular bonds and changes in the chemical structure of various compounds, which in turn leads to cell death.

Under the action of ionizing radiation on water, which is 60-70% of the mass of biological tissue, free radicals H and OH are formed, and in the presence of oxygen also free radical hydroperoxide (HO2) and hydrogen peroxide (H2O2), which are strong oxidants. The products of radiolysis enter into chemical reactions with tissue molecules, forming compounds that are not inherent in a healthy body. This leads to dysfunction of systems and vital functions of the body as a whole.

The intensity of chemical reactions induced by free radicals increases and they involve many hundreds and thousands of molecules that have not been exposed to radiation. This is the specificity of the action of ionizing radiation on biological objects, ie the effect created by radiation is due not so much to the amount of energy absorbed in the irradiated object, but to the form in which this energy is transmitted. No other type of energy (thermal, electrical, etc.) absorbed by a biological object in the same amount causes such changes that cause ionizing radiation.

Disorders of biological processes can be either reversible, when the normal functioning of the cells of irradiated tissue is completely restored, or irreversible, leading to damage to individual organs or the whole organism and the emergence of *radiation sickness*.

There are two forms of radiation sickness - *acute* and *chronic.*

The acute form occurs as a result of exposure to large doses in a short period of time. At doses of about an order of thousands of tips, the body's damage can be instantaneous ("death under the beam"). Acute radiation sickness can also occur when large amounts of radionuclides enter the body.

Chronic lesions develop as a result of systematic exposure to doses exceeding the maximum allowable (MRL). Changes in health are called *somatic effects* if they occur directly in an irradiated person, and *hereditary effects* if they occur in his offspring.

Radiation safety depends primarily on the small doses that accompany the practical use of nuclear energy. Therefore, in radiation safety standards, a unit of time is usually used per year, operating on the concept of "annual radiation dose" Adverse effects in the range of "small doses", little depends on the radiation. The effect is determined by the total accumulated dose, regardless of whether it was received in one day, in one second or during 50 years. Therefore, the effects of chronic radiation accumulate in the body over time.

It is impossible to refuse the use of radioactive substances in industry, science, medicine, technology, agriculture for objective reasons. Therefore, it is necessary to guarantee radiation safety, ie a state of the environment in which human radiation damage is virtually absent.

1.3.2. Chemical factors

In the process of life, a person is constantly exposed to a large number of chemical harmful factors that can cause various diseases, health disorders, injuries both in the process of contact and over a period of time. Approximately one million chemicals and compounds are known, of which 60 thousand are used in human activities. Between 500 and 1,000 new chemical compounds and mixtures appear on the international market each year.

Chemical hazards – *factors that have a high chemical affinity with human tissues and environmental substances (corrosive, toxic, explosive, etc.) and can cause harm to the human body.*

Chemical elements, substances and compounds can be in solid, gaseous and liquid physical states. Therefore, chemicals enter the human body through the

respiratory system, through the gastrointestinal tract, skin and mucous membranes. The degree of damage to chemicals depends on their toxicity, selective action, duration, as well as their physicochemical properties.

Poisoning can be acute or chronic. In any form of poisoning, the intensity of the harmful substance is determined by the degree of its physiological activity - toxicity.

Toxicity *(Greek toxikon - poison) - the property of some chemical elements, compounds and nutrients to adversely affect living organisms (plants, animals, fungi, microorganisms) and human health.*

According to the toxicity of toxic substances are divided into the following types:

- neuro-paralytic action (sarin - SV, soman-SD) - bronchospasm, asthma, paralysis;
- general toxic action (hydrocyanic acid, chlorine cyanide) - edema, coma, paralysis, convulsions, rapid heartbeat;
- irritating effect (ammonia, acid vapors) - irritation of the mucous membranes of the nose, mouth;
- skin rash (mustard gas) - local inflammation and necrotic changes in combination with general toxic phenomena.

The following groups of toxic substances are distinguished by the selectivity of action:

- cardiac, having a cardiotoxic effect (drugs, plant poisons, salts of barium, potassium, cobalt, cadmium);
- nervous, which lead to dysfunction of the nervous system (carbon monoxide, ammonia, carbohydrates, organophosphorus compounds, alcohol, drugs, sleeping pills, etc.);
- hepatic, causing liver damage (chlorinated hydrocarbons, aldehydes, phenols, phosphorus, selenium, etc.);
- renal, which negatively affect the kidneys (heavy metal compounds, ethylene glycols, oxalic acid, etc.);
- blood, change the activity of blood enzymes (derivatives of aniline, aniline, nitrites);
- pulmonary, leading to lung damage (nitrogen oxides, ozone, phosgene).

Depending on the practical use, chemicals are classified into:

- *industrial poisons* used in production (organic solvents, dyes) and are a source of danger of acute and chronic intoxications in violation of safety rules;
- *pesticides* used in agriculture to control weeds, rodents, insects, etc .;
- *drugs*
- *household chemicals* used as food additives, sanitary products, cosmetics;
- *biological poisons:* plant and animal, which are contained in plants and fungi, animals and insects;
- *toxic substances*: sarin, mustard gas, phosgene.

By the nature of the action of chemicals are divided into the following groups:

• toxic, which cause poisoning of the human body or affect its individual systems (eg, hematopoiesis, central nervous system)

• narcotic drugs that act on the central nervous system (alcohols, aromatic carbohydrates);

• irritants (acid vapors, alkalis), which cause irritation of mucous membranes, respiratory tract, eyes, lungs, skin;

• suffocating (carbon monoxide, nitrogen oxides), leading to toxic pulmonary edema;

• sensitizing (solvents, formalin) - substances that act as allergens;

• carcinogenic (aromatic hydrocarbons, cyclic amines, nickel, chromium), which lead to malignant tumors;

• mutagenic (lead, radioactive substances), which lead to a violation of the genetic code, change the hereditary information;

• those that affect reproductive function (radioactive isotopes, mercury, lead).

It is important to study the toxicity of any component of the environment to study its physicochemical properties, which allows certain formulas to calculate the parameters that characterize the toxicity of the substance and can be used in developing methods and means of protection against harmful substances.

1.3.3. Biological factors

Humans, animals and the natural environment in general may be threatened by biological factors, both at work and at home. Therefore, preventing them from being affected is a very important task.

Biological (Greek bios - life and logos - word, doctrine) risk factors - factors caused by the action of various living organisms.

These include microorganisms (plants and animals) and pathogenic microorganisms, pathogens of infectious diseases (bacteria, viruses, fungi, rickettsiae, spirochetes, protozoa).

Macroorganisms (poisonous plants and animals). Toxic substances of poisonous plants are various compounds that belong mainly to alkaloids, glucosides, acids, resins, hydrocarbons, etc. (Table 1.2).

Table 1.2

Characteristics of the effects of poisonous plants on the human body

The name of a poisonous plant	Action start time	Characteristics of action on the human body
Hemlock	After 5 minutes	Frequent vomiting, severe salivation, dizziness, pale skin, severe cramps
Mushrooms	from 15 minutes up to 2-3 days	Unbearable chest pain, constant vomiting, blood clotting, convulsions, deaths
Bleached black	After 30-40 minutes	Redness of the face and neck, agitation, cramps in the arms and legs, hallucinations, salivation, and subsequent dry mouth.

Among animal organisms, poisonous forms are more common than among plants. Poisons produced by animals are chemical factors involved in interspecific interactions. Representatives of the fauna of all stages of evolutionary development use chemicals to attack or defend (Table 1.3).

Table 1.3

Characteristics of the effects of poisonous animals on the human body

The name of the animal organism	Effect on the human body
Spider (Tarantula)	Extreme pain, headache, weakness, loss of consciousness, convulsions, tachycardia, hypertension, fatalities
Pincers	Bites, redness, itching, general poisoning
Insects (wasps, bees, ants, beetles)	Allergic reactions, anaphylactic shock, inflammation, pain, death
Fish (stingrays, sea dragons, scorpions)	Injections, weakness, sometimes loss of consciousness, diarrhea, convulsions, respiratory distress, hypotension, fatalities
Reptiles (cobras, snakes)	Paralysis of skeletal and respiratory muscles, suppression of emergency functions, lethargy, apathy, inhibition of reflexes, abnormal sleep, fatalities

Among animal organisms, poisonous forms are more common than among plants. Poisons produced by animals are chemical factors involved in interspecific interactions. Representatives of the fauna of all stages of evolutionary development use chemicals to attack or defend (Table 1.3).

Pathogenic microorganisms.

Features of the action of microorganisms are:

- high efficiency of human infection;
- the ability to cause disease due to contact of a healthy person with a sick person or with certain infected objects;
- the presence of a certain incubation period, ie from the moment of infection to the onset of complete disease (from several hours to tens of days);
- certain difficulties with the identification of certain types of pathogens;
- ability to penetrate unsealed premises, engineering structures and infect people in them.

Pathogens of infectious diseases are carriers of certain properties, the most important of which are pathogenicity; virulence; environmental resilience; variability and specificity.

Pathogenicity - the ability of living beings (usually microorganisms), as well as the products of their activities to cause disease in other organisms. Depending on the size of the structure and properties of pathogenic organisms are divided into bacteria, viruses, rickettsiae, fungi and more.

Virulence - aggressive properties of microorganisms against animals and humans. The virulence of different strains of microorganisms is not the same. Its measure is the minimum number of living microorganisms that can cause death of experimental animals (minimum lethal dose). More often use the average lethal dose, which causes 50% of animal deaths.

According to the stability in the environment, ie the ability to resist its effects, microorganisms are classified into *low-resistant*, *medium-resistant* and *resistant.*

Variability - the ability of living organisms to acquire new features, different from those inherent in the ancestors, in the process of individual development. It provides the appearance of certain features, due to which new species are formed and the historical development of the biosphere takes place.

An important property of pathogenic microorganisms is the *specificity*, which is manifested in the fact that each species acts differently on the body, causing a specific disease and immunological resistance of the organism. Therefore, infectious diseases have characterising symptoms.

The causative agents of infectious diseases include various types of microorganisms - bacteria, viruses, fungi and more. Infections caused by them can spread over large areas, leading to epidemics that affect a significant number of the population.

Components of the epidemic process are the sources of infection (humans, animals, plants), the ways of its transmission and the susceptibility of the population. Infectious diseases are spread mainly by contact (touch, cut on the skin, through the mouth or sexually) and breathing. The most risky direct contact with the patient's blood or secretions. Infections can also be transmitted through objects contaminated with blood or secretions of the patient, and through vectors (indirect contact) - mosquitoes, lice, flies, etc ..

The relationship that arose in the process of evolution between organisms and the biological host is manifested in different ways (commensalism, mutualism, symbiosis, parasitism).

Variety of pathogenic microorganisms, different pathogenicity and virulence, penetration into the body in different quantities, different resistance are manifested in different courses of infection. Therefore, take into account the manifestations of not only typical but also asymptomatic (hidden) forms. The degree of manifestation of the infectious process, namely, the interaction between the pathogen and the human body, is divided into three types: 1) a typical form of infection; 2) atypical form; 3) hidden form. The first type of infectious process covers typical forms of the disease. Isolation of significant properties of a typical infection, or a change in the intensity of its manifestation is defined as an atypical course (outpatient, abortive form). The group of latent infections should include all forms in which there is no clinical manifestation of the disease (latent, dormant, etc.). From an epidemiological point of view, it is important that regardless of the degree of infection, its carrier poses a threat to others.

We are protected from infectious diseases by the skin and *the immune system* - immunity to infectious diseases. It can be natural and artificial, passive and actively acquired.

Groups of infectious diseases. Depending on the general characteristics of infectious diseases associated with the localization of the pathogen in the human body and the mechanism of infection, all infectious diseases are divided into four main groups (Table 1.4).

Infectious diseases and invasions that occur in the agricultural complex are classified by their causative agent:

bacterial: tuberculosis, brucellosis, salmonellosis, leptospirosis, anthrax, listeriosis, erysipeloid, plague, tularemia;

viral: rabies, ornithosis, cholera;

rickettsiosis: fever;

fungi: actinomycosis, blastomycosis, candidiasis, coccidioidosis, cryptococcosis, microsporia, triphophytia, histoplasmosis, epidermophytia;

the simplest: echinococcosis, teniosis, trichinosis.

Table 1.4

Groups of infectious diseases

Groups of infectious diseases	Disease	Localization of the pathogen	Ways of transmission of infection
Respiratory tract infections	Acute respiratory - viral diseases (influenza, parainfluenza, adenoviral infection, etc.), sore throat, diphtheria, measles, whooping cough, tuberculosis	Upper respiratory tract	Air - drip
Intestinal infections	Dysentery, typhoid fever, paratyphoid fever, cholera, viral hepatitis, polio	Intestine	Through food, water, land, household items, flies
Blood infections	Malaria, typhus and recurrent typhus, tick-borne encephalitis	Circulatory system	Due to the bites of vectors - mosquitoes, ticks, fleas, lice, mosquitoes, etc ..
Infections of the outer coverings	Scabies, tetanus	Skin, mucous membranes	Contact

Prevention of infectious diseases. Prevention of infectious diseases. It involves exposure to the sources of infection, the routes of transmission, and the person in contact with the infectious patient. Prevention measures include: immunization, early, active and complete detection of patients, their timely isolation, hospitalization and treatment, disinfection measures at the site of infection, etc.

The main method of infection prevention is immunization - the introduction of weakened pathogens or toxins into the body to gain immunity.

To successfully combat infectious diseases, even in peacetime, in many cases it is necessary to carry out mass vaccinations in a very short time.

Nowadays, there are a large number of diseases whose pathogens can be used by the enemy as bacterial agents. It is impossible to vaccinate against all these diseases, because no one can withstand so many vaccinations. In these cases, especially to establish the type of pathogen used, resort to antibiotics and other special drugs. They kill the virus in the unprotected body, and also help the vaccinated body to cope better with the pathogens. Bacteriophages and therapeutic sera are also used for treatment.

Bacteriophages cause the dissolution of disease-causing microbes in the human body and prevent the development of the disease or provide a therapeutic effect. Serums are characterized by rapid creation in the body of artificial non-perception of an infectious disease.

To protect against the penetration of infections into the human body, the same means are used as for protection against radioactive and chemical toxic substances. These remedies are divided into:

♦ individual (gas masks, protective masks and skin protection);

♦ collective (specially equipped engineering structures).

Disinfection, disinsection and deratization are mandatory components in the complex of measures aimed at biological protection.

If the fact of mass infectious diseases is established, *quarantine* is introduced - a set of regime, administrative and sanitary anti-epidemic measures aimed at preventing the spread of infectious diseases and eliminating the lesion. *Observation* is a set of measures aimed at enhanced medical surveillance of the source of infection. *Disinfection* - a set of special measures aimed at destroying pathogens of infectious diseases in the environment. Types of disinfection are:

disinsection - destruction of insects - vectors of infectious diseases;

deratization - extermination of rodents, dangerous in epidemic terms. These measures are carried out to prevent the transmission of the pathogen from sick to healthy people.

There are preventive disinfection, current, final. For disinfection people use physical, chemical and combined methods, in which physical and chemical methods of disinfection are applied simultaneously (for example, washing clothes in hot soapy water).

- **Physical methods of disinfection are carried out using mechanical, thermal and radiation means.**

- *Mechanical means* provide removal, but not destruction of microorganisms. These are cleaning, wiping, washing, shaking, sweeping, airing. When using drones up to 98% of microorganisms are removed. Ventilation is effective enough when its duration is not less than 30-60 minutes.

- *Thermal agents* are based on the use of high and low temperatures, namely: hot air, steam, boiling, pasteurization, incineration, freezing, drying. Ironing is a disinfectant, but it is mostly superficial. Freezing does not cause the death of microorganisms, but over time leads to a decrease in their number.

Drying for a long time leads to the death of a large number of microbes.

- *Radiation disinfectants* are the use of sunlight, ultraviolet rays, and radioactive radiation. Direct sunlight has a detrimental effect on many pathogens of infectious diseases. However, this method depends on the season, weather and it is used as an auxiliary.

Ultraviolet irradiation for air disinfection in operating, procedural, etc. To do this, people use germicidal lamps. Radioactive radiation acts on all types of microorganisms and their spores. Most often, ionizing radiation in the factory sterilizes disposable instruments. In some cases, ultrasound is used for disinfection.

Chemical methods of disinfection are widely used in practice. They are based on the use of various chemicals that kill microorganisms. Chemicals have different effects on microorganisms:

-bactericidal - the ability to kill bacteria;
-bacteriostatic - suppress their vital functions;
-virulicidal - the ability to kill viruses;
-fungicide - the ability to kill fungi.

Among the chemical disinfectants are *soft disinfectants*, which are used to disinfect the skin of hands, clothes, linen and *strong disinfectants*, which are used to disinfect highly contaminated materials (feces, shoes, toilets, etc.).

Chemical disinfectants include:
-chlorine and its compounds (solutions of chlorinated lime, chloramine….)
-halogens (alcohol, iodonate, Lugol's solution….)
-oxidizers (hydrogen peroxide, potassium permanganate….)
-phenols (phenol, lysol)
-alcohols (ethyl, methyl)
-aldehydes (formalin, formaldehyde)
-acids, alkalis, dyes, salts of heavy metals and others.

Antisepsis. *Methods of antiseptics* (Greek anti - against and septikos - purulent) - a set of measures aimed at destroying microbes in the wound, in the pathological focus or the body in general - can avoid the negative impact of biological damaging factors.

There are physical, mechanical, chemical and biological methods of antiseptics.

Physical methods allow to create in the wound unfavorable conditions for the development of bacteria and the absorption of toxins and decomposition products. This is ensured by external drainage of the infected wound with tampons, drainage and drying of wounds by light and thermal procedures (irradiation with Solux, quartz).

Mechanical methods include techniques that are aimed at the fastest (in the first hours) removal from the wound of necrotic tissue, blood clots, foreign bodies and with them microorganisms.

Chemical methods provide the destruction of microbes in the wound with the help of various antiseptics. Antiseptics should be bactericidal or bacteriostatic and should not damage tissues.

Biological methods (antiseptics) are aimed at increasing the body's defenses and creating unfavorable conditions for the development of microorganisms. Biological agents include: antibiotics, enzymes, immune sera.

Restriction of contact and an infectious agent also contributes to compliance with the rules of personal hygiene and patient care.

1.3.4. Psychophysiological factors

The work activity of a person and his body is influenced by the volume of perception and processing of information; physical, neuropsychological, mental, emotional overload; rhythm and pace of work; monotony of labor. Their evaluation allows to determine the degree and nature of workload, compliance of the workplace and means of work with anatomical and physiological features of man, to establish rational modes of work and rest, to arrange workplaces, to establish professional selection and career guidance, etc.

Every profession has certain requirements for the mental properties and health of employees. They pay attention to their temperament, character, attentiveness, perception, memory, thinking, emotions, psychomotor skills, education, experience, upbringing and health, which determine abilities, regulate relationships between people and directly control actions and deeds.

Psychophysiological risk factors *- factors caused by the peculiarities of physiology and psychology of man, which can harm him in certain circumstances.*

They include:

- Deficiencies of the senses (defects of vision, hearing, etc.);
- disruption of connections between sensory and motor centers, as a result of which a person is unable to respond adequately to changes perceived by the senses;
- defects in coordination of movements (especially complex movements and operations, techniques, etc.);
- increased emotionality; fatigue;
- emotional phenomena (conflict situations, stress related to family, friends, management);
- carelessness, which can lead to the lesions not only of the individual but also of the team;
- lack of motivation to work (lack of interest in achieving goals, dissatisfaction with wages, monotony of work, lack of cognitive moment, ie uninteresting work);
- lack of experience (mistakes, wrong actions, stress of the nervous and mental system); fears of making a mistake increase the likelihood of an accident.

Dangerous and harmful psychophysiological production factors, depending on the nature of the action are divided into the following groups:

- physical overload (static, dynamic);
- neuropsychiatric overload (mental overload, analyzer overload, monotony of work, emotional overload, hypodynamics, hypokinesia, fatigue, drowsiness).

Hypodynamia (from the Greek. Hypo - under and dynamis - strength) - dysfunction of the body (musculoskeletal system, circulation, respiration, digestion) due to limited motor activity, decreased muscle contraction. The causes of hypodynamics can be physical, physiological and social factors (reduction of the load on the musculoskeletal system, immobilization, being in small closed rooms, sedentary lifestyle, etc.). Most people around the world suffer from lack of physical activity. A sedentary lifestyle can lead to the development of many cardiovascular diseases. Almost 2 million people die from hypodynamia every year (the number is predicted to grow).

Doctors have calculated that physical activity for half an hour a day can significantly reduce the risk of many common non-communicable diseases: hypertension, diabetes, etc., because they are often caused by hypodynamics. Mechanization and automation have minimized physical activity, their absence has become a real "disease of civilization." Hypodynamia reduces the blood supply to tissues, in addition, lack of physical activity has a negative effect on metabolism and energy in the body, deteriorating oxygen supply to tissues and organs, nutrient intake decreases.

Hypokinesia (Greek hypo - decrease, decrease, insufficiency, and kinesis - movement) - a painful condition of the body due to insufficient motor activity. Sometimes this condition leads to hypodynamics.

Monotony is a mental state of a person caused by the monotony of perceptions or actions.

Accordingly, there are:

o monotony caused by information overload of nerve centers due to the receipt of a large amount of identical signals with repeated repetition (for example, work on conveyors with small operations);

o monotony caused by uniformity of perception (for example, long-term observation of instrument panels in anticipation of an important signal).

Thus, common features for monotony are information overload during the performance of work or, conversely, its lack, which affects the functional state of man: the worker (operator) loses interest in their activities, he has a state called "production boredom"; a similar condition in drivers of vehicles - "road hypnosis". Monotonous work can lead to a reassessment of working hours (the shift seems much longer), the worker is looking forward to the end of the shift.

Monotony has a negative impact on efficiency: deteriorating economic performance, increasing injuries and accidents, increasing staff turnover.

Fatigue - the process of reducing efficiency, a temporary decline in strength that occurs when performing certain physical or mental work. This is an objective phenomenon that disappears after rest.

There are rapidly developing fatigue (primary fatigue) and slowly developing fatigue (re-fatigue). Primary fatigue occurs as a result of work that requires significant physical effort or considerable stress. The decline in strength is the result of a violation of central coordination, the emergence of emergency centers of inhibition due to the mismatch of the work task to the functional characteristics of the organism. The main sign of primary fatigue is a fairly rapid recovery of body functions. Slow-growing fatigue is characterized by a gradual decline in performance as a result of habitual but excessively long or monotonous work. It occurs more often when a person lacks work skills.

Physiological rationalization, in particular the optimal organization of work and rest, rational organization of the labor process, effective training in order to quickly master work skills allows to prevent fatigue and increase efficiency. Criteria for the effectiveness of the mode of activity are considered to be increased productivity, the presence of a stable dynamic working stereotype, accepted production and physiological indicators.

Fatigue is a subjective mental phenomenon that is accompanied by feelings of weakness and unwillingness to work.

Doctors have found that about 1/5 of patients complain of fatigue, and a third of teenagers experience fatigue at least four days a week. Women and men describe fatigue differently: men usually complain of fatigue, and women experience depression or anxiety.

Fatigue is classified as secondary (due to a specific disease), which can last a month or longer, but generally less than six months; physiological (occurs due to an imbalance in routine exercise, sleep, diet or other activity that is not caused by any disease and passes after rest); chronic fatigue (lasts more than six months and does not disappear after rest).

Drowsiness - a violation of the normal mechanism of awakening, which is embodied in constant attempts to fall asleep. People who suffer from it, under the influence of any activity, temporarily wake up. After a short sleep, they feel better, and patients with fatigue complain of lack of energy, mental exhaustion, muscle weakness, slow recovery of strength after exercise and fatigue after sleep.

Human mental states are important in injury prevention and accident prevention. Neuropsychological overloads occur, as a rule, on the way to the realization of vital interests, in situations that prevent (sometimes, conversely, suddenly contribute) to this implementation. They are manifested in critical states: stress, frustration, conflict, crises, trance, ecstasy, paraxism.

Psychogenic mood swings last from a few minutes to several months. They occur for the following reasons:

• unsatisfactory nature of activity (heavy physical activity, high pace, analyzer overvoltage, nervous overstrain, etc.). The result is complete exhaustion, weakening of the psyche, weakening of accuracy, speed of orientation, attention, etc .;

• death of loved ones, shock, conflict situation. The consequences are similar to the previous paragraph. Self-control is lost;

• state of affect (explosion of emotions) as a result of unexpected luck (or vice versa), resentment, etc .; accompanied by sharp aggressive movements, dulling the sense of danger and sense of responsibility. In this state, a person, without thinking, will take risks and lead people. Affected individuals cannot be commanders and leaders;

• use of special drugs:

- light stimulants (tea, coffee) that help to overcome drowsiness, lethargy; their effect is short-lived; they do not affect coordination, speed of movement, reaction.
- tranquilizers that relieve psychological activity, slow down the reaction, cause drowsiness, apathy. Their use can cause injuries and danger to life;
- alcohol, drugs that make it impossible to further assess the situation, dull the sense of danger, disrupt coordination and reaction, etc., ie are extremely dangerous.

One of a person's emotional reactions to danger is anxiety. A person who is in this state is prone to mistakes or dangerous actions. Anxiety can manifest itself as a feeling of helplessness, self-doubt, helplessness in the face of external factors. In

situations of threat there is a feeling of fear and its shades: fear, fright, horror. Awareness of danger causes a reaction of fear, which manifests itself in inappropriate actions or, conversely, there is a sense of caution. Such a form of fear as panic has a negative effect on human activity.

Thus, psychophysiological factors permanently or temporarily increase the possibility of dangers, but this does not mean that their presence always leads to a dangerous situation. Such risk factors directly affect the physical and physiological processes, performance, mood, productivity, life in general.

1.4. Risks in human life

Danger in any field of activity has a quantitative characteristic and dependence on many factors that are constantly changing over time. One of the most common manifestations of danger is risk. The risk of action or the risk of inaction is present in 90% of the causes of accidents at work.

The concept of "risk" does not have an unambiguous definition. There is no generally accepted system of terms in risk assessment. The concepts of "danger" and "risk" are most often used. Interpretations of these terms are inconsistent, so it is important to give a precise definition that reflects the relationships and contradictions between society, the environment and the latest technology. The source of danger and risk to human health can be society, environment and technology together or each of these factors separately, ie it is possible to identify sources of danger and risk of natural, social or natural-social genesis (development).

In the broadest interpretation, risk is understood as an act that is carried out in conditions of uncertainty, but the risk can be passivity, inaction. As a rule, a person takes risks to achieve the desired goal. Or avoid physical danger. Thus, risk can be regarded as a dangerous condition and as an act (dangerous human action as an element of the system).

Risk **-** the statistical frequency of the probability of hazards, ie adverse circumstances that may occur in an adverse event; quantitative characterization of hazards.

The consequences or quantification of damage caused by the hazard depend on many factors, such as the number of people in the hazardous area, the quantity and quality of the affected property, natural resources, the prospects of the area, and so on.

In the structure of substantive activity, risk performs various psychological functions. It can be the goal of human activity, and its motive, if it seeks thrills. Psychologists believe that everyone has a need for risk.

In Ukraine, the only state system for preventing and responding to emergencies is still focused mainly on responding and overcoming the consequences of dangers. This negatively affects the opportunities, effectiveness of measures, reduction of losses and reduction of risks. The experience of developed countries confirms that the protection of population and territories should be based on the management of risks of natural and man-made nature through the application of preventive measures, the

introduction of new quantitative methods for assessing man-made and natural risks. It is necessary to gradually change the reflective management model and move to a strategy focused on preventing the consequences of emergencies and minimizing them. Therefore, it is important to introduce a risk-oriented approach to reduce the risk of crises and develop government programs to prevent and eliminate adverse events[7].

A risk-based approach *is a set of organizational measures that involves monitoring, analyzing, and a ssessing the risk of any business entity based on a probabilistic safety analysis to prevent emergencies and manage risk in general.*

1.4.1. Environmental risk

The concept of "environmental risk" is now interpreted differently. Many authors consider its components not only the risk to public health, but also other types of risk, such as: risks of destruction of natural systems, public health, failure of man-made systems at specific enterprises, natural resource management, natural disasters, the impact of regional military conflicts , the risk of environmental terrorism (S. Pirozhkov)

Within environmental and environmental research, there is also a different understanding of risk assessment. Some scientists link environmental risk to certain environmental factors and study the risk to individual health (the likelihood of specific adverse environmental effects), others ─ consider risk as a concept defined at the population level**[7]**.

> ***Ecological risk*** *─ the probability of negative changes in the environment caused by anthropogenic or other influences: causing damage to the environment in the form of possible losses over time.*

1.4.2. Man-made risk

The most intensive and powerful source of generating new types of risks is *the technosphere*. The number and consequences of major industrial catastrophes today indicate a tendency to a constant increase in man-made risks.

> ***Man-made risk*** *- risk to the population, social and natural objects caused by negative events of man-made origin.*

Protecting itself from man-made accidents, society uses various legal, organizational, managerial, technical, scientific and methodological tools. However, such catastrophes continue to threaten stable development and can significantly affect the state of national security and vital functions of the state.

The term "technogenic safety" refers to almost all dangerous objects of the technosphere, including military, agricultural, artificial space objects, etc., accidents in which pose a threat to the population and the environment.

Man-made safety *- the degree (level) of protection of vital interests of the person, society and the state from technogenic emergencies on potentially dangerous objects.*

In the preventive sense, technological security should be considered in two dimensions: strategic and tactical. The first concerns aspects of the development of new domestic technologies and the import of foreign technologies to Ukraine, as well as the implementation of the "principle of protection against the implementation of potentially dangerous technological projects." The second is the management of technological safety of existing technological complexes at potentially dangerous facilities (PDF).

1.4.3. Social risks and ways of their state provision

Ukraine's path to integration with the European Union and achieving the standard of living of European countries takes place in difficult socio-economic conditions. Reforming the financial, economic, humanitarian, social and other spheres of life requires the state to make decisive and radical changes, which will take place in a regime of limited budget resources and austerity. In addition, a new challenge for Ukraine was social protection and support for fundamentally new vulnerable categories of citizens: people who were forced to leave their homes due to hostilities and their usual way of life. But under any circumstances, all social policy measures, without exception, to support the already "familiar" and "new" vulnerable categories of the population must now be not only appropriate, timely, balanced, but, above all, effective. And, as international experience shows, this is best facilitated by monitoring and evaluation - tools for successful management.

In Ukraine, over the last year, preserving the welfare of the population, reducing the risk of poverty and preventing its spread has once again come to the forefront of social policy and social protection. In Ukraine, the system of state social assistance is represented by a wide range of cash and non-cash benefits, which cover the poorest and most vulnerable and guarantee them a level of income not lower than the statutory minimum, or do not exceed certain types of expenditures (such as housing and communal services) over the established for this case part of the income. As of 2013, there were about ten major state social support programs in the country (five of which apply only to families with children), as well as preferential provision for about 80 categories of citizens. The principle underlying their provision is categorical or targeted. In contrast to developed countries, where state monitoring and evaluation of the effectiveness of social programs is an integral part of public administration in the social sphere, in Ukraine until recently this component of social support management did not receive due attention from the state. Monitoring and evaluation of the effectiveness of the programs was mostly performed by the approved Ministry of Social Policy. And only in 2012 the relevant legal documents were adopted, which regulate the system of monitoring, evaluation, analysis and audit of the four main social support programs on a permanent basis since 2014. Among the monitoring indicators of social support programs, special attention is paid to

evaluation their impact on the poverty situation in the country and among the target contingents.

Social risk *- events in a person's life in which there is a danger of losing material resources to meet its primary (basic) needs that are necessary to preserve and reproduce a full life as a member of human society.*

The Universal Declaration of Human Rights proclaims the right of everyone "to such a standard of living, including food, clothing, shelter, and medical care as is necessary for the maintenance of the health and well-being of himself and of his family." similar in content social standard is enshrined in the ILO Convention "On the basic objectives and norms of social policy" №117 1962. Taking into account the content of the concept of "standard of living", the primary (basic) needs include the needs for food, clothing, housing, medical care and social services.

1.4.4. Social insurance against accidents and occupational diseases at work

Social insurance against accidents at work and occupational diseases is carried out in accordance with the Law of Ukraine "On Compulsory State Social Insurance against Accidents at Work and Occupational Diseases That Caused Disability" (hereinafter the Law)

This Law applies to persons working under an employment agreement (contract) at enterprises, institutions, organizations, regardless of their forms of ownership and management (hereinafter - enterprises), individuals, persons who provide themselves with work independently, and citizens - business entities.

The state guarantees all insured citizens the right to insurance against accidents at work and occupational diseases.

Legislation on accident insurance consists of the Fundamentals of the legislation of Ukraine on compulsory state social insurance, the Law "On compulsory state social insurance against accidents at work and occupational diseases that caused disability", the Labor Code of Ukraine, the Law Ukraine "On labor protection" and other regulations.

The tasks of accident insurance are:

carrying out preventive measures aimed at eliminating harmful and dangerous production factors, prevention of accidents at work, occupational diseases and other cases of threat to the health of the insured caused by working conditions; restoration of health and working capacity of victims at work from accidents or occupational diseases; compensation for damage related to the loss of insured persons' wages or the relevant part of it during the performance of their duties, the provision of social services in connection with damage to health, as well as in the event of their death insurance payments to disabled members of their families.

The main principles of accident insurance are:

- parity of the state, representatives of insured persons and employers in the management of accident insurance;
- timely and full compensation of damage by the insurer;
- compulsory insurance against accidents of persons working under an employment contract and other grounds provided by labor legislation, as well as the

voluntary nature of such insurance for self-employed persons and citizens - business entities; providing state guarantees for the realization of their rights by insured citizens;

- obligatory payment of insurance premiums by the insured;
- formation and spending of insurance funds on a joint and several basis;
- differentiation of the insurance rate taking into account the conditions and state of occupational safety, occupational injuries and occupational diseases at each enterprise;
- economic interest of insurance entities in improving working conditions and safety;
- targeted use of accident insurance funds.

1.4.5. Subjects and objects of accident insurance

The subjects of accident insurance are insured citizens, and in some cases - members of their families and others, policyholders and the insurer.

The insured is an individual in whose favor the insurance is provided (hereinafter - the employee).

Insurers are employers, and in some cases – insured persons.

Insurer - Social Insurance Fund for Accidents at Work and Occupational Diseases of Ukraine (hereinafter - the Social Insurance Fund for Accidents).

The object of accident insurance is the life of the insured, his health and ability to work.

According to the Law, the employer is considered to be:

- the owner of the enterprise or the body authorized by him and an individual who uses hired labor;
- the owner of a foreign enterprise, institution, organization (including international ones), branch or representative office located in Ukraine, who uses hired labor, unless otherwise provided by an international agreement, the binding nature of which has been approved by the Verkhovna Rada of Ukraine.

Compulsory accident insurance is subject to:

1) persons working on the terms of an employment agreement (contract) or on other grounds provided by labor legislation;

2) pupils and students of educational institutions, clinical residents, graduate students, doctoral students involved in any work during, before or after classes; during classes, when they acquire professional skills; during the internship (internship), work at enterprises;

3) persons who are detained in correctional, medical-labor, educational-labor institutions and are involved in labor activity at the production of these institutions or at other enterprises under special agreements.

The consent of the employee is not required to insure against an accident at work. Insurance is provided in an impersonal form.

All persons listed in Article 8 of the Law are considered insured with

the moment of entry into force of this Law, regardless of the actual fulfillment by insurers of their obligations to pay insurance premiums.

All insured are members of the Social Accident Insurance Fund.

The following can be insured against an accident voluntarily:

1) persons who provide themselves with work independently - are engaged in advocacy, notarial, creative and other activities related to the receipt of income directly from this activity, members of the farm, personal farm, if they are not employees;

2) citizens - business entities.

Persons subject to accident insurance are issued a certificate of compulsory state social insurance, which is the same for all types of insurance and is a document of strict reporting.

1.4.6. Insurance risk and insured event

Insurance risk - the circumstances in which an insured event may occur.

An insured event is an accident at work or an occupational disease that caused the insured professionally caused physical or mental injury in the circumstances specified in Article 14 of the Law, which gives rise to the insured person's right to receive material support and / or social services.

An occupational disease is also an insured event if it is established or detected during a period when the victim was not in an employment relationship with the enterprise where he fell ill.

An accident or occupational disease that occurred as a result of a violation of labor protection regulations by the insured is also an insured event.

Violation of labor protection rules by the insured, which caused an accident or occupational disease, does not release the insurer from the obligations to the victim.

The fact of an accident at work or an occupational disease is investigated in accordance with the procedure approved by the Cabinet of Ministers of Ukraine, in accordance with the Law of Ukraine "On labor protection". The basis for payment to the victim of medical expenses, medical, professional and social rehabilitation, as well as insurance payments is an act of accident investigation or an act of investigation of an occupational disease (poisoning) in the prescribed forms.

1.4.7. Social Accident Insurance Fund

Accident insurance is carried out by *Fund of social insurance* against accidents – the non-profit self-governing organization operating on the basis of the charter which is approved by its board.

The Social Accident Insurance Fund is a legal entity, has a seal with the image of the State Emblem of Ukraine and its name, as well as an emblem, which is approved by its board.

Management of the Social Accident Insurance Fund is carried out on a parity basis by the state, representatives of insured persons and employers.

The Social Accident Insurance Fund is directly managed by its board and executive directorate.

The Board of the Social Accident Insurance Fund includes representatives of three representative parties:

- states;
- insured persons;
- employers.

From each of the three representative parties is appointed and elected (delegated) 15 members of the Board of the Social Accident Insurance Fund with a casting vote and 5 of their backups, who in the temporary absence of board members by decision of the Chairman of the Board.

The Board of the Social Accident Insurance Fund is established for a period of six years. Board of the Social Accident Insurance Fund:

1) elects from among its members for a term of two years the Chairman of the Board of the Fund and his two deputies. This provides alternate representation in these positions of each of the three representative parties;

2) directs and controls the activities of the executive directorate of the Fund and its working bodies; annually, and if necessary, hears the reports of the director of the executive directorate of the Fund on its activities;

3) creates on a parity basis to address the most important tasks of the Fund permanent and temporary commissions on accident prevention, budget execution, pensions, etc .;

4) annually prepares and submits in the prescribed manner proposals for sectoral tariffs for social insurance contributions against accidents;

5) appoint the director of the executive directorate of the Social Accident Insurance Fund and his deputies;

6) approves:

- the charter of the Social Accident Insurance Fund, changes to it;
- regulations of the board of the Social Accident Insurance Fund; annual budgets of the Fund and reports on their implementation, the procedure for using the budget and reserve funds of the Fund;
- Regulations on the Executive Directorate of the Social Accident Insurance Fund;
- structure of the Fund's bodies, maximum number of employees, schemes of their official salaries, expenses for administrative and economic expenses of the Fund;
- annual work programs and reports on their implementation;
- Regulations on the service of insurance experts on labor protection, prevention of accidents at work and occupational diseases;
- Regulations on the procedure for the use of funds by medical and preventive, educational and other institutions that provide social services to the Fund, and control over their intended use;
- The order of appointment, transfer and carrying out of insurance payments;

7) performs other functions provided by the charter of the Social Accident Insurance Fund;

Decisions of the Board of the Fund, which have a normative character and relate to the rights and obligations of policyholders and insured persons, are subject

to mandatory state registration in the manner prescribed for registration of regulations of executive authorities.

The Executive Directorate of the Social Accident Insurance Fund is a permanent executive body of the Fund.

The Executive Directorate is accountable to the Board of the Fund, conducts its activities on behalf of the Fund within the limits and in the manner prescribed by its charter and Regulations on the Executive Board of the Social Accident Insurance Fund, organizes and enforces decisions of the Fund.

The Executive Directorate of the Social Accident Insurance Fund provides logistical support for the work of the Supervisory Board and the Board of the Fund.

The Director of the Executive Directorate of the Social Accident Insurance Fund is a member of the Board of the Fund with the right of an advisory vote.

Insurance experts on labor protection

The performance of statutory functions and responsibilities of the Social Accident Insurance Fund for the prevention of accidents is entrusted to *occupational safety insurance experts.*

Insurance experts on labor protection may be persons with higher special education in the specialty of labor protection specialist or persons with higher technical or medical education who have experience of practical work at the enterprise not less than three years and the relevant certificate issued by a specially authorized central executive body.

Occupational safety insurance experts have the right to:

1) to visit enterprises without hindrance and at any time to check the condition of working conditions and safety and to carry out preventive work on these issues;

2) as a member of the relevant commissions to participate in the investigation of accidents at work and occupational diseases, as well as in testing the knowledge of labor protection of employees of enterprises;

3) receive explanations and information from employers, including in writing, on the state of labor protection and types of activities;

4) participate in the work of commissions on labor protection of enterprises;

5) make mandatory for employers to comply with the submission of violations of labor protection legislation;

6) draw up protocols on administrative offenses in cases provided by law;

7) participate as independent experts in the work of commissions for testing and commissioning of production facilities, means of production and personal protection, equipment and control devices.

Occupational safety insurance experts conduct their activities in accordance with the Regulations on the Service of Occupational Safety and Health Insurance Experts, Prevention of Accidents at Work and Occupational Diseases.

1.4.8. Rights and obligations of the insured and the insured

The Insured has the right to:

1) participate on an elective basis in the management of accident insurance;

2) be an authorized representative of the insured workers and demand from the Social Accident Insurance Fund to fulfill its responsibilities for the social protection of victims;

3) participate in the investigation of the insured event, including with the participation of a representative of the trade union body or his proxy;

4) in the event of an insured event to receive from the Social Accident Insurance Fund payments and social services provided for in Article 21 of the Law;

5) for medical rehabilitation services;

6) for vocational rehabilitation services, including job retention, training or retraining, if the total duration of vocational rehabilitation does not exceed two years;

7) to reimburse the costs of medical and professional rehabilitation for travel to the place of treatment or training and back, the cost of housing and meals, transportation of luggage, travel of the person accompanying him;

8) for social rehabilitation services, including the purchase of a car,

prostheses, assistance in housekeeping, provided in accordance with the law;

9) receive free of charge from the Social Accident Insurance Fund explanations on social insurance against accidents.

In the event of the victim's death, his family members are entitled to receive from the Social Insurance Fund against accidents insurance payments (one-time assistance, survivor's pension) and services related to the burial of the deceased.

The Insured is obliged to:

1) know and comply with the requirements of legislative and other regulations on labor protection relating to the insured, as well as comply with the obligations on labor protection provided by the collective agreement (agreement, employment contract, contract) and the rules of internal labor regulations of the enterprise;

2) in case of an accident or occupational disease:

a) to be treated in medical and preventive institutions or by medical workers with whom the Social Accident Insurance Fund has concluded agreements on medical care;

b) follow the rules of conduct and treatment regimens defined by doctors who treat him;

c) not to evade professional rehabilitation and implementation of instructions aimed at his return to work as soon as possible;

d) timely inform the working body of the executive directorate of the Social Insurance Fund against accidents about the circumstances that lead to changes in the amount of material support, the composition of social services and the procedure for their provision (changes in the state of incapacity for work, family composition, dismissal from work, employment, departure from the state, etc.).

The employer as an insured has the right to:

1) participate on an elective basis in the management of accident insurance;

2) require the Social Accident Insurance Fund to fulfill the Fund's responsibilities for the organization of accident prevention

and occupational diseases and social protection of victims;

3) to appeal against the decisions of the employees of the Social Accident Insurance Fund in special commissions for resolving disputes at the executive directorate of the Fund and its working bodies;

4) protect their rights and legitimate interests, as well as the rights and legitimate interests of the insured, including in court.

The employer as an insured is obliged to inform the working body of the executive directorate of the Social Accident Insurance Fund:

1) about each accident or occupational disease at the enterprise;

2) on the change of technology of works or type of activity of the enterprise for transfer it to the appropriate class of occupational risk;

3) submit to the working body of the executive directorate of the Social Accident Insurance Fund information on the annual actual volume of sold products (works, services), the number of accidents and occupational diseases at the enterprise for the previous calendar year;

4) free of charge to create all necessary conditions for work at the enterprise of representatives of the Social Accident Insurance Fund;

5) inform the employees of the enterprise of the address and telephone numbers of the working body of the executive directorate of the Social Accident Insurance Fund, as well as medical and preventive institutions and doctors who serve the enterprise under agreements with this Fund;

6) submit reports to the working body of the executive directorate of the Social Accident Insurance Fund within the time limits, in the manner and according to the form established by this Fund.

The Social Accident Insurance Fund is liable in accordance with the law for damage caused to insured persons as a result of non-compliance, late or improper compliance with the insurance conditions established by law.

Employees of the Social Accident Insurance Fund are liable in accordance with the legislation of Ukraine for violations of legislative or other normative legal acts on accident insurance.

Health care institutions, vocational rehabilitation institutions and citizens who provide social services to insured persons are civilly liable for damage caused to insured persons or the Social Accident Insurance Fund due to falsification of data on the volume and quality of services provided.

The Insured shall be liable for damage caused to the Insured or the Social Accident Insurance Fund as a result of failure to fulfill its accident insurance obligations, in accordance with the law.

2. Physiological factors of provision human security

2.1. Structural - functional organization of man in terms of interaction with the environment

Everyone is a living organism, a complex bioenergetic system, the vital activity of which is ensured at the physiological, mental and social levels.

The body is an open biological self-regulating system that exchanges matter and energy with the environment, reproduces itself and adapts to changes in environmental conditions.

Like all living organisms, man uses nutrients and oxygen, and also releases into the environment the products of metabolism, water and carbon.

The human biological system has different levels - molecular, supramolecular (cell organelles), cellular, tissue, organ, organism. They are all interconnected and interact.

The basic structural and functional unit of an organism is a *cell*. Homogeneous cells, united by a common function, structure and origin, form *tissues*. Epithelial, connective, muscular and nervous tissues are distinguished in the human body by their morphofunctional properties. The complex of tissues united by a common function, structure and development, form an *organ* - a part of the body that performs a specific, unique function. Sets of organs form *organ systems*. There are the following systems: musculoskeletal, circulatory, respiratory, food, nervous, urogenital, endocrine (endocrine glands). Organ systems make up the *body*.

In the human and animal body, the interconnected work of all organs and physiological systems is provided by neurohumoral regulation, which is carried out through the influence of the nervous system and active biological substances contained in the blood, lymph, tissue fluid.

Man, like all natural beings, has a body formed from subsystems of organs that form a single structural and functional system. It provides metabolism and energy with the natural environment through numerous connections and processes[3].

The basis of human life is metabolism (metabolism), due to two opposite processes: assimilation - the assimilation of substances from the environment, and the formation of complex compounds from simpler, which become part of biological structures or deposited in the form of reserves; dissimilation - the decomposition of complex organic compounds into simpler ones.

The source of energy in cells and tissues in general is the oxidation of proteins, fats and carbohydrates to inorganic and simple organic compounds (water, carbon dioxide, urea).

Homeostasis (Greek homoios - similar and stasis - standing) - the relative stability of the internal environment of the human body (blood, lymph, tissue fluid) and the stability of basic physiological functions (blood circulation, respiration, thermoregulation, metabolism).

Fluctuations in a large number of indicators of homeostasis in a certain range indicate that a living organism is a dynamic system capable of adapting to specific living conditions. The possibilities of adaptation are limited by certain parameters (for example, body temperature - 36 - 370, glucose content 3.3 - 3.5 mol / l). Deviations of the main indicators of homeostasis from the norm indicate a serious illness.

Blood, lymph and tissue fluid wash the tissues and cells of the body. Blood has a liquid consistency, so it can move freely through blood vessels and performs transport, protective, respiratory, thermoregulatory, trophic, excretory functions.

Blood consists of a liquid part - plasma (about 58% of volume) and shaped elements - cells (42%): erythrocytes, thrombocytes, leukocytes. The total amount of blood in the body of an adult is normally 6 - 8% of body weight (approximately 4.5 - 6 liters).

The volume of circulating blood is 40 - 45% of the total blood volume, the last part of the blood is in the blood depot: liver, spleen, tissues. Loss of 1/2 - 1/3 of blood volume is life threatening. A small blood loss (up to 0.5 l) is compensated by the body itself due to the release of blood into the vascular bed from the spleen and the transfer of water from the tissues into the bloodstream.

Reactivity (Latin re - reversibility of action and activus - active) - the body's ability to respond appropriately to environmental influences.

There are individual and group reactivity. Individual reactivity is due to hereditary factors. It depends on the conditions in which the body develops, the nature of nutrition, climate zone, oxygen content in the air. Reactivity depends on gender (women are more resistant to hypoxia, blood loss, starvation), age. Early childhood is characterized by low reactivity. The highest reactivity in adulthood, the lowest - in old age. According to the forms of manifestation, there are increased (hyperergy), decreased (hypoergia), modified (desertion) reactivity.

Resistance (Latin resistens - counteracting) - the body's resistance to pathogenic factors.

Reactivity and resistance are closely related. Together they reproduce the basic properties of a living organism. If the impact of the environment is significant or prolonged, it can break the functional system (there will be structural and physiological disorders), and as a result, a person will get sick or it will change heredity.

Thus, man, like every living thing, is a natural organism that acts and develops according to biological laws.

The body's reactions are the only objective criterion for the environment's impact on it. Adaptive reactions of the organism make it possible to maintain its relative stability in conditions of significant fluctuations in environmental parameters. As long as the human body is able to use these reactions to ensure stable functioning, its health is safe. If the intensity of environmental factors exceeds the adaptive capacity of man, then there are dangers to normal life. Thus, the safety of human life to some extent depends on the body's response to external stimuli, its ability to avoid environmental hazards and adapt to changing environmental conditions.

Human analyzers and their role in the assessment of environmental hazards. A person is constantly exposed to a continuous flow of external stimuli, as well as a variety of information about the processes occurring inside and outside the body. Perceive this information and properly respond to it personality allows its senses: eyes, ears, tongue (as an organ of taste), nose (as an organ of smell) and so on. Each of these organs is designed to respond to certain environmental phenomena, converts signals from the outside world (sound, light, smell, mechanical stimuli) into signals from the nervous system - nerve impulses.

The brain receives these signals, processes them and sends an "order" to the executive: the person stops when he sees a red light; hurries to the kitchen, smelling

burnt food; picks up the phone when the phone rings. The senses work constantly, they direct actions and control them.

Each type of receptor perceives only one type of stimulus. Just a few quanta of light are enough to create a visual sensation; auditory receptors begin to send signals to the brain when the eardrum is displaced at a distance ten times smaller than the hydrogen atom; 2-3 molecules of fragrant substance are enough to smell.

The human analyzer consists of a *receptor, conductive nerve pathways and a brain ending.* The receptor converts the energy of the stimulus into a nervous process. Leading pathways transmit nerve impulses *to the cerebral cortex.*

The cerebral end of the analyzer consists of a nucleus and elements scattered throughout the cerebral cortex. Scattered elements provide neural connections between different analyzers. There is a two-way connection between the receptors and the brain end, which provides self-regulation of the analyzer. A feature of human analyzers is their parity, which ensures high reliability of their work due to partial duplication of signals and dynamic ambiguous functional asymmetry.

Thus, the receptors, the pathways by which excitation is transmitted, and the special areas of the cerebral cortex form a single system where sensation is born and stimuli are distinguished. This system IP Pavlov called the *analyzer.*

Analyzers - a set of interacting entities of the peripheral and central nervous system, which carry out the perception and analysis of information about the phenomena that occur both in the environment and inside the body.

In modern physiology, given the anatomical unity and commonality of functions, there are eight analyzers. However, in the system of human interaction with the environment, the main or dominant in the detection of danger are still visual, auditory and skin analyzers(Fig 2.1).

Types of analyzers in humans:
Main: visual, auditory, tactile
Additional: motor, gustatory, olfactory, vestibular, visceral
There are the following types of receptors:

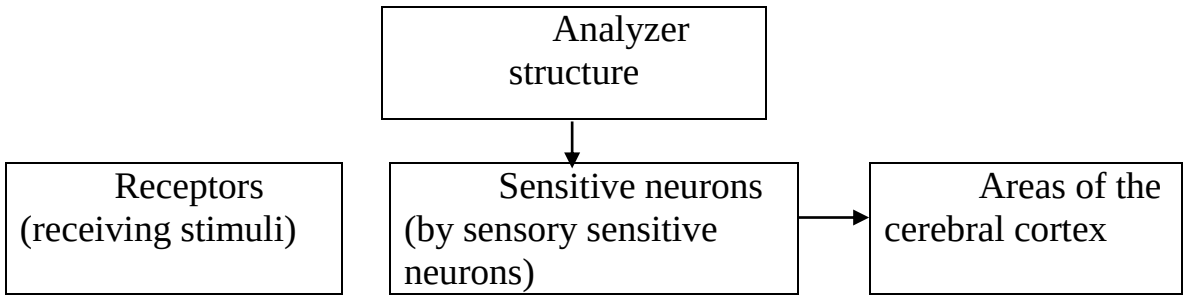


Fig 2.1. functional structure of the analyzer

There are the following types of receptors:

Mechanoreceptors that perceive mechanical energy. For example: auditory, vestibular, motor, partially visceral.

Chemoreceptors - olfactory, gustatory.

Thermoreceptors - skin.

Interreceptors - visceral.

Photoreceptors - visual

Analyzer properties:

- extremely high sensitivity to adequate stimuli;

- ability to adapt (analyzers are able to adjust the level of their sensitivity to the intensity of the stimulus - adaptation, due to which at high intensity of active stimuli sensitivity decreases and, conversely, at low - increases;

- ability to train (both in increasing sensitivity and in accelerating adaptation processes);

- the ability to maintain a feeling for some time after the cessation of the stimulus;

- analyzers under the condition of normal functioning are in constant interaction (vicarage - interchangeability, people are deprived of some, sometimes even several analyzers, live a full life, perceiving the world around in all variety of its displays);

the presence of absolute, differential and operational limit of sensitivity to the stimulus (absolute limit of sensitivity can be lower - - the minimum value of the stimulus that causes sensitivity, and the upper - the maximum allowable value of the stimulus that does not cause pain. Differential limit is determined by the smallest value of the stimulus. The operational limit of sensitivity is the magnitude of the signal at which the accuracy and speed of its distinction reach a maximum.

The minimum difference in the strength of two similar stimuli required to change the intensity of sensation is called the threshold of distinction. The lower and upper absolute thresholds of sensations (absolute sensitivity) and the thresholds of distinction (relative sensitivity) characterize the limits of human sensitivity.

The presence of absolute and differential limits of sensitivity was introduced by the German physiologist Weber and quantitatively described by the German physicist Fechner

The basic psychophysiological law of Weber-Fechner physiology.

The intensity of sensation is proportional to the logarithm of the intensity of the stimulus:

$$S = CLn1 \qquad (2.1)$$

where S is the intensity (or strength) of sensation,

1 - the magnitude of the stimulus;

C - is the coefficient of proportionality.

3. Life safety in natural and man-made environments

3.1. The natural environment of human life

Man as a natural being is an element of the natural environment - a source of resources to sustain life. Its safety directly depends on the conditions in which it interacts with nature.

The natural environment of life –is the part of the earth's nature, with which society interacts directly, obtaining resources for life and development.

The natural environment was formed as a result of the long evolution of the planet Earth and the influence of human activity.

Components of the environment of human life. The biosphere comprises part of the atmosphere, hydrosphere, and upper lithosphere, which are interconnected by complex biogeochemical cycles of migration of matter and energy.

Atmosphere. It is the gas shell of the Earth that rotates with it. The atmosphere is formed by nitrogen (70%), oxygen (21%) and inert gases (2%).

By the nature of changes in various parameters, the Earth's atmosphere is divided into the following layers: troposphere (9-18 km), where the air is suitable for respiration; stratosphere (50-55 km), where the air is thin, and the temperature in the lower part is 55 ^{0}C, in the upper - 0 ^{0}C; mesosphere (80-90 km), in which the temperature decreases and reaches - 80-90 0C; thermosphere (90 to 800-1000 km), where the temperature rises to 1000 0C, and the exosphere (above 800-1000 km), in which the air is completely rarefied.

The ozonosphere roughly coincides with the stratosphere and has a maximum concentration of ozone at an altitude of 20-25 km.

The main components of air that affect human life are:

1) atmospheric oxygen (O2), necessary for respiration of humans, animals, most plants and microorganisms. The source of its formation is the photosynthesis of green plants (almost 70 billion tons of oxygen per year). Approximately 80% of oxygen is produced by marine phytoplankton, 20% by terrestrial vegetation. Oxygen is also formed from water vapor, which in the upper atmosphere under the influence of UV radiation decomposes into H + and O-;

2) carbon dioxide, which is a mandatory component of plant photosynthesis. It enters the atmosphere due to volcanic eruptions, decay of organic matter, respiration of living organisms, vapors from the surface of the oceans;

3) water vapor. Its content in the atmosphere is determined by the ratio of evaporation, condensation and horizontal transfer. In the surface part, the concentration of steam is from 0.1-0.2% in the polar latitudes, to 3% - in the equatorial. Water vapor is a source of clouds, fog, precipitation, in combination with carbon dioxide (CO2) protects the earth's surface from excessive cooling, providing a greenhouse effect. If there were no atmosphere, the average temperature of the Earth's surface would not be + 15 ^{0}C, but - 23 ^{0}C.

The atmosphere regulates the Earth's heat exchange with outer space, affects its radiation and water balances. The interaction of the atmosphere with the ocean, the processes of gas and heat exchange between them significantly affect the Earth's climate.

Hydrosphere. It is the water shell of the Earth. The aboveground part of the hydrosphere, which covers 70% of the Earth's surface, includes oceans, seas, lakes, rivers, and glaciers in which water is in a solid state. The high polarity of water molecules causes a strong ability to dissolve other substances, including polar (salts). Therefore, there is no chemically pure water in nature. Depending on the amount of dissolved substances, natural waters are divided into: fresh (with a salt content of up to 1 g per 1 liter of water); brackish (with a salt content of 1 to 25 g per 1 liter of water); salty (with a salt content of 25 to 50 g per 1 liter of water); brine (with a salt content of more than 50 g per 1 liter of water).

Only fresh water is suitable for living organisms. Its reserves (almost 70%) are contained in glaciers and snow, only 0.75% of water reserves are available to living organisms. The total amount of water in the surface shells of the Earth, the earth's crust is 1 trillion 600 million tons. The period of complete circulation of all water in the processes of formation of living matter reaches 2 million years.

The chemical composition of sea water is close to human blood, so the main hypothesis of the emergence of man states that life originated in water.

Lithosphere. It is the outer hard shell of the Earth, which covers the earth's crust with part of the upper mantle and consists of sedimentary, erupted and metamorphic rocks. The lithosphere contains all mineral resources and is one of the main subjects of human anthropogenic activity. Soils are located in the upper part of the continental crust. Within the lithosphere, modern physical and geographical processes (landslides, villages, landslides, erosion) periodically occur, which affect the ecological situation in different regions.

Biosphere. It is the Earth's crust, formed by living organisms, or a collection of living beings that inhabit the Earth, a zone of organic life that covers the sphere of interaction of the atmosphere, lithosphere and hydrosphere.

The modern interpretation of the biosphere was proposed by V. Vernadsky: "The biosphere is the shell of life, the sphere of existence of living matter."

The most important function of the biosphere is to sustain life. The fundamental condition for this function is the physiological diversity of living organisms.

3.2. Hygienic characteristics of environmental factors

Hygienically important environmental factors include: radiation, air, fresh water, soil.

Solar radiation. It affects all physiological processes in the human body, changing metabolism, overall tone and performance. Under the action of ultraviolet rays in the body are formed biologically active substances that stimulate the physiological processes of the body.

The most biologically active is the ultraviolet part of the spectrum of solar radiation. Ultraviolet radiation with wavelengths ranging from 180 to 275 nanometers (nm) damages biological tissue and is harmful to microorganisms. It does not reach the Earth's surface, but is absorbed by ozone molecules in the stratosphere. Ultraviolet rays in the wave range from 275 to 320 nm have a slight bactericidal effect and enter into photochemical reactions of vitamin D synthesis. Rays with a wavelength of more than

290 nm reach the Earth's surface, providing natural remediation of air, water and soil. Ultraviolet radiation in the wavelength range from 320 to 400nm causes skin tanning.

Lack of sunlight is often manifested in the violation of physiological balance in the body and the development of pathological phenomena - sunlight or light ("ultraviolet") starvation. The body of a developing child suffers especially from the lack of sunlight, because vitamin D is not produced, which leads to the development of rickets. Sunlight has a positive effect on emotional interaction, psychophysical, anti-rickets, immunological action, increases the body's resistance to external conditions, accelerates the processes of self-cleaning that occur in the air.

Under the influence of UV - radiation enhances enzymatic processes, the formation and absorption of physiologically active substances (including vitamin D), normalizes metabolism, increases the immunological reactivity of the body, the tone of the nervous and muscular systems.

The air does not contain pathogenic microflora, because it quickly dies under the action of direct sunlight (especially tubercle bacillus). Indoors for 3-4 hours. Continuous sunlight kills almost all bacteria.

Visible light (wavelength range from 400 to 760 nm) has a general biological effect. Although the physiological level of vision is individual, it always depends on the intensity of natural light, so its provision in the premises is hygienically important. The greatest productivity, in particular mental, is caused by sufficient natural (instead of artificial) lighting. Appropriate hygienic standards are set in accordance with the physiological characteristics of visual functions. Light also affects the functional state of the central nervous system.

Infrared radiation with wavelengths from 760 to 25000nm causes only thermal action, which is largely determined by the absorption of rays by the skin. The shorter the wavelength, the more radiation penetrates the fabric. A specific reaction of the body at high intensity infrared radiation can be a sunstroke caused by overheating of the cortex of the cerebral hemispheres.

Air. Its hygienic role is determined by such properties as temperature, humidity, speed, atmospheric pressure, electrical condition, chemical and bacteriological composition, the presence of aerosols.

Temperature significantly affects life processes due to changes in the rate of biochemical reactions. According to Vant-Goff's rule, the rate of all chemical reactions increases with increasing temperature. To maintain thermal homeostasis, a person uses a thermoregulatory mechanism that provides a stable body temperature with significant fluctuations in air temperature.

The body receives heat as a result of metabolic processes (oxidation of nutrients) and the release of heat during exercise, and from the surrounding warm objects (warm air, hot food, solar radiation). The intensity of metabolic processes is decisive in the accumulation of heat in the body. The body gives off heat by convection, radiation and evaporation in quantities that depend on external conditions. In a state of rest and thermal comfort, convection accounts for 15%, radiation - 56%, evaporation - 29% of heat. The intensity of heat transfer through convection increases with increasing temperature difference between the body and air, air velocity and surface area of the human body. From high air

temperatures (above 35 ° C) most of the excess heat is released due to the evaporation of sweat, along with which salts and water-soluble vitamins are excreted from the body.

Humidity also affects the body's heat transfer. The degree of saturation of air with water vapor, ie relative humidity, is of hygienic importance. High relative humidity (over 90%) inhibits sweat evaporation and can contribute to overheating at high temperatures. In the case of low humidity, intense heat transfer due to evaporation of sweat leads to cooling of the body. Therefore, a person tolerates high temperatures more easily if the air is dry. However, excessive dryness of the air (less than 20%) is also undesirable because it dries the mucous membranes of the nose, pharynx and mouth, which causes the formation of cracks that are easily infected. The relative humidity is in the range of 40-60%.

With increasing *air velocity*, heat transfer increases due to convection and sweating, so a person can tolerate low temperatures more easily in calm weather. Strong wind disrupts the rhythm of breathing, and long - even depresses a person. Outdoors in summer are the most favorable air velocities in the range of 1-5 m / s.

Atmospheric pressure at sea level is 1.01 * 105 PA, presses on the entire surface of the human body (with an average area of 1.6 m2) with a force of approximately 1.6 * 105N (equivalent to the force with which the object acts on a person weighing 16 tons). Man does not feel it, because this external pressure is completely balanced by the internal pressure in the cells and tissues of the body. Typical changes in atmospheric pressure in the range (0.5-1.3) * 103 PA (in the range of 4 - 10 mm Hg) healthy people do not notice, but sharp fluctuations due to atmospheric fronts can lead to adverse changes in the body, especially in ill patients. As altitude increases, atmospheric pressure decreases, while the oxygen content decreases. At sharp rise up there is an oxygen starvation of fabrics. The supply of oxygen in the body does not exceed 0.9 liters, which is enough for 5-6 minutes. life. After that, the phenomenon of oxygen deficiency develops. The first symptoms of oxygen deficiency are detected at an altitude of 3 km.

The electrical state of the atmosphere is characterized by ionization of air, the presence of electric and magnetic fields of the Earth and natural radioactivity.

Air gases have different meanings for living matter on Earth. Reducing the amount of oxygen in the air to 14% is critical, up to 8% - incompatible with life. An increase in the oxygen content in the air (over 28%) leads to the development of pathological processes in the body, in particular to a decrease in lung capacity and pneumonia.

Nitrogen and inert gases are indifferent to living organisms and to solar radiation. However, an increase in nitrogen content to 93% is fatal due to a decrease in oxygen content. Air nitrogen is assimilated only by individual soil bacteria and blue-green algae.

Carbon dioxide plays a very important role in the processes of photosynthesis and respiration, reduces heat transfer to the Earth due to the adsorption of radiation coming from the earth's surface. The share of carbon dioxide, neon, helium and all other gases present in the air in microquantities is only slightly more than 0.04%. In the bottom layers of the atmosphere, especially in cities, the composition of the air changes. An important variable in the atmosphere is carbon dioxide. 100 years ago, the content of carbon dioxide in the air was 0.0298%, and now - 0.0318%, and in cities even higher. Interestingly, the acceleration - the enhanced growth of children - some scientists explain the high content of carbon dioxide in the air.

As a result of increasing the content of carbon dioxide in the indoor air to 4% there is a headache, tinnitus, rapid heartbeat, and its accumulation up to 8% is incompatible with life due to acute poisoning. Adverse effects of carbon dioxide (deterioration of health) can be traced when increasing its content to 0.1%. This value is accepted as the maximum allowable concentration when calculating the ventilation of the premises.

Ozone is a gas that protects living organisms from the harmful effects of harsh ultraviolet radiation from the Sun, absorbing it at altitudes ranging from 18 to 26 km. It is formed due to the interaction of ultraviolet radiation with a wavelength of less than 200 nm with oxygen. In the lower atmosphere, in the human respiratory zone, ozone adversely affects health, causing lung and eye disease.

Aerosols of natural and anthropogenic origin are constantly in the air. Hygienically significant parameter of aerosols is dispersion, particles smaller than 0.1 mcm do not settle and are constantly in the air. Particles larger than 5 mcm are trapped in the upper respiratory tract, causing mucosal irritation and chronic inflammation. Particles smaller than 5 mcm are the most dangerous, as they can enter the lungs, infecting lung tissue, causing chronic poisoning by lead, manganese, arsenic dust and malignancies in the case of inhalation of a carcinogenic substance - benzopyrene. In addition to mineral suspended particles in the air there are constantly spores of fungi, bacteria, plant pollen, which can cause allergic reactions.

Water. Its physiological significance for humans is due to the fact that it is part of all body tissues: from tooth enamel with a content of 0.2% to the vitreous (99%.). The average water content in the body is 60-70%, the loss of a third of it is fatal. Water is the main part of the blood, secretions and excretions of the body. One of its important functions is the transport function: the delivery of nutrients to cells and the removal of toxins and toxic substances from the body with sweat, urine and saliva. Water plays a significant role in the body's thermoregulation by evaporating sweat.

Under normal conditions, the body's daily need for water is 1-1.5 liters as a liquid and 1-1.2 liters as a part of food. One of the mechanisms of regulating the flow of water into the body is thirst, the occurrence of which is associated with water-electrolyte balance and due to a violation of osmotic pressure. However, the main role in regulating water-electrolyte balance belongs to the nervous system. The subjective feeling of thirst quickly persists for a long time, a person may consume excess water, which is disturbing. Excess water content that may occur does not cause a mechanism of self-regulation.

Water is also of hygienic importance. The amount of water that one person uses per day is one of the most important indicators of the sanitary well-being of the population. Water is needed to keep the body clean, tempering, cleaning, cooking, washing dishes, washing clothes and more. For such purposes, the city dweller uses up to 250-350 liters of water per day.

However, water is a favorable environment for the reproduction of many pathogenic microorganisms and one of the ways of spreading infectious diseases, so epidemiological monitoring of drinking water is important.

Soils. They significantly affect the quantity and quality of food of both plant and animal origin, as well as an environment for the development of pathogenic bacteria, viruses, helminth eggs. The mineral basis of soils contains almost all chemical elements, but in different amounts. The uneven distribution of them in accordance with the peculiarities of geological and soil-forming factors, causes a change in the mineral

composition of groundwater and many plants, which affects the flow of minerals into the human body. Soils are important epidemiologically because they contain pathogens of many infectious diseases (intestinal infections, polio, Botkin's disease, anthrax, whooping cough, brucellosis, tuberculosis, botulism, tetanus, gangrene), eggs and larvae of helminths that enter directly or indirectly organism.

Clean, uncontaminated soils are unfavorable for pathogenic non-spore microorganisms. In contaminated soils, especially organic matter, these microorganisms retain their activity for a long time, some of them up to a year or more. As for spore-bearing microorganisms, they remain viable in soils for decades.

Soils are characterized by a unique property - self-cleaning. Which is that bacteria, viruses and helminth eggs that get into the soil with organic matter are partially retained and as they move, their number decreases. Under the influence of mechanical, physicochemical, biological and biochemical ability of soils, sewage discolors, loses odor, toxicity and other properties. The destruction of bacteria is facilitated by competition from saprophytes, the influence of mechanical factors, the bactericidal action of solar radiation. However, the possibilities of self-cleaning of soils are limited. Significant pollution can even cause the death of all beneficial microflora. One of the indicators of soil contamination is the sanitary number, which is defined as the ratio of nitrogen content in humus to total nitrogen content in soil. In the process of self-cleaning, this figure approaches one.

Thus, the impact of the atmosphere, water resources, soils on the safety of human life is of great importance.

3.3. Natural threats and the nature of their manifestations and effects on humans, animals, plants, objects of the economy

Emergencies of natural origin in Ukraine are divided into geological, meteorological, hydrological, natural fires. Their emergence is facilitated by the peculiarities of geographical location, atmospheric processes, the presence of mountains, the proximity of warm seas, and others. Natural disasters are caused by a variety of climatic conditions: from excessive moisture in Western Polissya to arid in the southern steppe zone. Exceptional climatic conditions on the southern coast of Crimea, in the mountains of the Ukrainian Carpathians and Crimea.

As a rule, natural phenomena are caused by endogenous, exogenous and hydrometeorological factors.

Natural disasters are classified into simple, having one element (eg, strong wind, landslide, earthquake) and complex, formed by several processes (negative atmospheric and geodynamic exogenous processes, endogenous, exogenous and hydrometeorological processes in combination with man-made).

Geologically dangerous phenomena. These include earthquakes, volcanoes, villages, karsts, landslides, talus, abrasion and more.

Earthquake is the oscillations of the earth's crust, which occurs due to explosions in the depths of the earth, fractures of the earth's crust, active volcanic activity. An earthquake causes elastic oscillations of the earth (seismic waves) that propagate in all directions. The part of the earth from which the earthquake waves

come is called its center, and the epicenter located on the surface.

The intensity of the earthquake is measured in points on the Richter scale or on a 12-point international scale MZK-64. It decreases to the periphery of the disaster zone. The epicenters are located at a depth of 30-60 km, sometimes - up to 700 km. Depending on the causes and location of earthquakes are divided into tectonic, volcanic, landslides and earthquakes.

Earthquakes cover large areas and are accompanied by:

1. destruction of buildings and structures, the wreckage of which people fall, the emergence of mass fires and industrial accidents;
2. flooding of settlements and entire areas;
3. gas poisoning during volcanic eruptions;
4. defeat of people and destruction of buildings by fragments of rocks;
5. damage to people and the emergence of fires in settlements from volcanic lava;
6. failure of settlements during landslides;
7. destruction and washing away of settlements by tsunami waves;
8. negative psychological effect.

Seismic zones surround Ukraine in the southwest and south: Transcarpathian, Crimean-Black Sea and South Azov. Dangerous are Zakarpattia, Ivano-Frankivsk, Chernivtsi, Odessa regions and the Autonomous Republic of Crimea.

It is still impossible to prevent earthquakes, forecasts are confirmed only in 80% of cases. According to UNESCO, earthquakes rank first in the world in terms of economic damage and death toll.

Volcanism is a set of phenomena caused by the penetration of magma from the depths of the earth to its surface. The processes of mud volcanism are localized in the southern part of Ukraine, on the Kerch Peninsula and the adjacent waters of the Sea of Azov, in the west and south of Sevastopol in the Black Sea. Material losses from eruptions of mud volcanoes are significant - they destroy buildings and parts of the village. Active volcanoes produce mercury vapor, which leads to geochemical anomalies that are harmful to human health. Activation of mud volcanoes in the area of the South Azov fault can worsen navigation conditions.

The causes of mudslides are almost always heavy rains, intense melting of snow and ice, breaking of dams, earthquakes and volcanic eruptions, as well as anthropogenic factors (deforestation and soil degradation on mountain slopes, rock explosions when laying roads, work in carts era, improper organization of landslides and elevations, air pollution, which is detrimental to soil and vegetation). Mud flow, suddenly formed due to a sharp rise in water levels in mountain riverbeds. It is a continuous stream of rock, mud and water moving at a speed of 2 to 10 m / s. The volume of the mudflow can reach hundreds of thousands and even millions of cubic meters, and the size of the fragments - up to 3-4 m in diameter and weighing almost 100-200 tons. Currently, from 3 to 25% of the territory of Ukraine is affected.

Karst process is a phenomenon associated with the dissolution of rocks by natural waters. In some regions of Ukraine the degree of karst damage reaches 60-100% of the territory. Particularly dangerous areas of open karst development

(funnels, wells, abysses), which make up 27% of the total area of karst formation. The most developed open karst in the Volyn region covers an area of 594 km2, Rivne region - 214 km2, Khmelnytsky region - 4235 km2.

Landslide - a downward displacement under the action of gravitational forces of large soil masses that form the slopes of mountains, rivers, lakes and sea terraces. This phenomenon can be caused by both natural and artificial (anthropogenic) causes. The natural ones include: increasing the steepness of the slopes, washing away their bases by sea or river water, seismic shocks. Artificial causes are: destruction of slopes by road ditches, excessive soil removal, deforestation, incorrect choice of agricultural machinery for agricultural land on the slopes. Up to 80% of modern landslides have been caused by human activity. The shear speed is from 0.06 m / year (up to 3 m / s).

The area of landslide processes has increased fivefold in the last 30 years. They are distributed in almost half of the territory of Ukraine, in particular in Zakarpattia, Ivano-Frankivsk, Chernivtsi, Mykolaiv, Odesa, Kharkiv regions and Crimea. The most common are landslides (up to 5 km) and landslides.

Rockslides are the separation and catastrophic fall of large masses of rocks, their crushing and rolling down cliffs, precipices and slopes. They are observed in the mountains, on the shores of the seas, on the cliffs of river valleys due to the weakening of the cohesion of rocks under the action of weathering, washing, dissolution and gravity. their emergence is facilitated by the geological structure of the area, the presence of cracks on the slopes and areas of fragmentation of rocks. However, most often (up to 80%) modern landslides are caused by anthropogenic factors. They occur mainly during improper work, construction and mining.

Rash - accumulation of gravel or soil at the foot of the slopes. In the Carpathian and Crimean mountains, some scree led to human losses.

Abrasion - the process of destruction by surf waves of shores, lakes and reservoirs. This process is common on the Black Sea coast. In the coastal zone of Crimea, 22 hectares of coastline disappear annually, between the Danube Delta and Crimea - 24 hectares, in the northern part of the Sea of Azov 19 hectares. Up to 60% of the shores of the Azov and 30% of the Black Seas are subject to abrasion. Its speed averages 1.3-4.2 m / year.

Meteorological and dangerous phenomena. Over the last decade, approximately 240 cases of catastrophic natural phenomena of meteorological origin with significant material damage have been recorded in Ukraine. These include: heavy rains (Carpathian and Crimean mountains); hail (throughout Ukraine); heat (steppe zone); dry winds, droughts (steppe and eastern forest-steppe zones); hurricanes, tornadoes (most of the territory); dust storms (southeast of the steppe zone); heavy fogs (southeast of the steppe zone); blizzards (southeast of the steppe zone); snow drifts (Carpathians); significant ice (steppe zone); severe frost (north of Polissya and east of the forest-steppe zone).

Along the coast and in the waters of the Black and Azov Seas there are *storms, hurricanes, tornadoes, downpours, icing of buildings and vessels, heavy fogs, blizzards, ice.* The steppe zone suffers the most from the influence of natural meteorological phenomena, where they are observed both in the warm period of the

year (strong heat, dust storms, dry winds, forest fires), and in the cold (frosts, ice).

The Ukrainian Carpathians are characterized by *heavy rains* (causing mudslides and downpours), *hail, winds, fogs, blizzards, and heavy snowfalls.* The coasts of the Black and Azov Seas are in the zone of influence of atmospheric phenomena inherent in the marine climate.

The most common natural disaster is *heavy rains* (showers). They are observed annually and cover large areas, especially in the Carpathians and the Crimean mountains. In the warm period of the year, heavy rains are accompanied by hail, which damages crops. In the steppe zone, strong heat (more than 40 ° C) is especially common.

In Ukraine, *intense dry winds* are winds with high temperature and low relative humidity. They cause wilting and death of plants. Most dry winds affect the steppe zone, partly - the forest-steppe zone.

Droughts reduce soil moisture reserves, impair plant growth, and sometimes lead to their death. They most often occur in the south of the steppe zone.

A hurricane is a wind of 12 on the Beaufort scale. In most parts of Ukraine, winds with a speed of over 25 m / s occur almost annually. Most often - in the Carpathians, Crimean mountains and Donbass.

Cyclone - vortex motion of the atmosphere with decreasing pressure from the periphery to the center. In terms of properties, origin and consequences, they are similar to tropical hurricanes. In the Sea of Azov, cyclones often lead to storms.

Gusts - a sharp short-term increase in wind, sometimes up to 30-70 m / s with a change in its direction. This phenomenon is most often observed during a thunderstorm. A hazardous situation can occur throughout Ukraine.

Atmospheric vortex, which occurs in a storm cloud and spreads in the form of a dark sleeve or trunk (often several) towards the surface of land or sea, is called a tornado. The destructive effects of this element can be compared to the effects of a shock wave of nuclear weapons, but tornadoes are rare.

Dust storms are complex atmospheric phenomena that are accompanied by the transfer of dust and sand by strong and prolonged winds, which destroy the soil surface, causing particularly great damage to agriculture.

Frosts, blizzards, ice are probable on the whole territory of Ukraine. Fogs impair visibility on roads, create obstacles for various modes of transport, contribute to air pollution.

Hydrological and dangerous phenomena. These include dangerous rises and falls in sea level, floods (in river basins), mudflow (in the Carpathian and Crimean mountains), low water.

Sea level rises and falls occur (along the coast and in the Black and Azov Seas). For almost 20 years, the shores of the Saxon-Evpatoria system have been destroyed at a speed of 3.5 km every year due to man-made factors. During the year, more than 100 hectares of coastal areas are irretrievably lost, the beach strip is reduced, and the biological productivity of the sea is reduced. The material values located in the coastal zone are under constant threat of destruction.

The main reasons for the increasing rate of destruction of sea shores are both natural factors associated with tectonic submergence (lowering) of the North

Priazovye, and anthropogenic, which include over-regulation of solid runoff, pollution of water basins and reduced productivity, unsystematic coastal development and spit, construction of shore protection structures that do not meet hydrodynamic processes, use of inefficient or even harmful shore protection measures and structures during "self-construction", deviations from design decisions, uncontrolled sand removal, violation of landslide regime when building terraces and other harmful economic activities on the coast.

A significant amount of money and material resources is spent annually to eliminate the effects of *floods* on the rivers of Ukraine. They occur during prolonged downpours and due to melting snow, wind gusts of water, congestion and flooding. The zones of possible floods on the territory of Ukraine are the basins of the Dnieper, Pripyat, Desna, Dniester, Tisza, Prut, Western Bug, Seversky Donets, Psal, Vorskla, Sula, Dnieper, Danube, Southern Bug and their tributaries. Floods (flooding) last from 7 to 20 days or more. It is possible to flood not only 10-70% of agricultural land, but also a large number of man-made objects.

Low water - the period (phase) of the hydrological regime of a water body, during which there is a decrease in its water content (20% more than normal), resulting in deteriorating needs of the population and the economy.

Natural fires. Every year in dry, hot weather the danger of forest and peat fires increases sharply. They arise from human fault and due to the action of certain natural factors. The fire can spread quickly and, picked up by the wind, destroy settlements, people, pets, property. The most dangerous are hot and dry summer days with a relative humidity of 30-40%. Depending on the nature of the fire, the speed of the fire and the extent of damage to the forest, there are four categories of forest fires: *lowland, upperland (mass), underground (peat or soil), hollow tree fires.*

Grassland fires occur most often (almost 80% of all cases), in which coniferous undergrowth, living above-ground cover, ie plants and plant remains, burn. Upper forest fires develop from the lower ones, and not only the above-ground cover burns, but also the lower tiers of trees and the crowns of poles. Underground fires often occur in late summer as a continuation of the lower or upper. They cover huge areas, they are difficult to extinguish.

Thus, the emergence of emergencies of natural origin in Ukraine is facilitated by geographical location, atmospheric processes, climate, and especially human activity. Man-caused load on the environment is 5-6 times higher than in developed countries, so natural-man-made hazards associated with the operation of dams, reservoirs, land reclamation, mining are likely. Natural disasters can affect various industrial facilities, structures, etc., lead to fires, explosions, emissions of hazardous substances, flooding, radioactive contamination, traffic accidents, accidents in power plants.

4. Influence of socio-political environment on life safety

4.1. Social environment and man

In the process of life, people surround other people, interactions between which form a human community, the so-called social environment (society). Society is a system of divisions and spheres of social life, the harmonious interaction of which

causes conflicts and deformations. The sphere of social life includes: material, socio-political, spiritual and cultural and domestic.

Under the social environment, they understand part of the life of life, which characterizes the achievement of a person in the creation of socio-political, spiritual and intellectual (information) values that form the worldview of a person, lead to behavior in the field of relations with the environment.

Man is a social creature. It can only develop in the environment of themselves similar, to live and act only in society, communicate and unifying their efforts with others. Her life and activity are conditioned not only by natural, but also a social factor, which is the regulator of the functioning of human society, which passed through disaster, a lesson of history on bitter experience of understanding. That the most valuable is not political ideas, not technological achievements. Not utopian ideas of Ecumenical happiness. And simple survival and safe existence. People are more clearly aware that without complying with certain rules and regulations among themselves. Techniques and nature they may disappear forever. Society must be responsible for its existence on earth. Therefore, the life of people should be balanced, deeply meaningful, and activity - oriented not only on a fleeting present, but also aimed at the future. This is largely due to the level of society's culture, which is a condition for the formation of the worldviews of people regarding their safe existence.

The features of the Third Millennium Society can be considered: globalization of the economy, large capital flows, moving masses of people, the emergence of transnational crime, infectious diseases, etc.

Every person in the process of life acquires certain habits.

The habits are the form of behavior of people that appears during the training of Ibagatorasova repetition in different life situations, which are accompanied by automatically.

The psychophysiological basis of habits is a dynamic stereotype, that is, well-assimilated and secured by temporary bonds. Regarding human health and a way of life, habits can be useful and harmful.

Healthy Lifestyle. Modern ideas of world science in relation to the phenomenon of human health are based on the new understanding of the topicality of the survival of mankind in general.

At the end of the twentieth century, the leaders of world science healed the problem of health to the collapse of global problems, which determines the fact of the further existence of mankind as a biological species on the planet Earth.

Currently, in the scientific circulation there was a new definition - anthropological disaster, the essence of which is that, according to the basic biological law, each biological species extends if the conditions of existence, to which it was adapted by millennia during evolution. By the last stage of the development of mankind (by the beginning of the twentieth century), the conditions for its existence formed nature, and it is to these conditions of the human body and adapted biologically during the previous evolutionary period. But since the person embraced almost the entire planet (twentieth century), it began to significantly

change the conditions of life, which was adapted in its historical and biological development.

These changes in the last quarter of a century, as evidenced by objective studies, acquired a catastrophic scale. According to the medical statistics, the increase in the incidence and mortality is observed precisely from the second half of the twentieth century, and some scientists are associated with the fact that negative processes have become planetary scope.

The limitations of a purely medical approach that defines health as a lack of illness are revealed. According to modern ideas, health is considered not as purely medical, but as a comprehensive problem, complex phenomenon of global value. That is, health is defined as philosophical, social, economic, biological, medical category, as an object of consumption, capital deposit, individual and public value, a systematic phenomenon, dynamic, constantly interacting with the environment. The state of the own health system of health determines only about 10% of the entire impact complex. The remaining 90% falls on the ecology (about 20%), heredity (about 20%), and most - on the condition and lifestyle (about 50%).

Hence, it is generally accepted in the international community definition of health, set out in the preamble of the WHO Statute (1948): *"Health is a state of full physical, spiritual and social well-being, and not just the absence of illnesses or physical defects."*

Currently, everything is more established by the point of view, according to which health is determined by the interaction of biological and social factors, that is, external influences are mediated by the features of the functions of the body and their regulatory systems. There is a definition of health as a state of optimal human life. The discussion on determining the concept of health is still ongoing, but it is important to recognize that human health is not reduced to physical condition, but provides for psychoemotional balance, spiritual and social health.

World science has developed a holistic view of health as a phenomenon that integrates at least four of its spheres or components - physical, mental (mental), social (social) and spiritual.

The sphere of physical health includes such factors as individual features of the anatomical structure of the body, the course of physiological functions of the body under different conditions of peace, movement, environment, genetic heritage, level of physical development of bodies and systems of the organism.

The sphere of mental health attribute the individual peculiarities of the mental processes and properties of a person, such as excitement, emotionality, sensitivity. The psychic life of the individual consists of needs, interests, motives, incentives, installations, goals, feelings, etc. Mental health is associated with the peculiarities of thinking, character, abilities. All these components and factors determine the peculiarities of individual reactions to the same life situations, the likelihood of stresses, affects.

Spiritual health depends on the spiritual world of personality, in particular components of the spiritual culture of mankind - education, science, art, religion, morals, ethics. Consciousness of a person, her mentality, life self-identification, attitude towards the meaning of life, an assessment of the realization of their own

abilities and opportunities in the context of their own ideals and outlook - all this causes the state of spiritual health of the individual.

Social health is associated with economic factors, relations with the individual with the structural units of society - the family, organizations that are created by social bonds, labor, rest, life, social protection, health protection, existence safety, etc. Affect interethnic relations, weight differences in profits of various social strata of society, level of material production, technology and technologies, their controversial influence on health in general. These factors and components create a sense of social security (or insecurity), which significantly affects human health. In general, social health is determined character and level of development of major spheres of social life in a certain environment - economic, political, social, spiritual.

It is clear that in real life, all four components are social, spiritual, physical, mental, and acts simultaneously and their integrated influence determines the state of health of a person as a holistic complex phenomenon.

The concept of a healthy lifestyle. From the standpoint of the above understanding of the human health, the determination of the concept of a healthy lifestyle (CHL): this is all in human activities relating to the preservation and strengthening of health, all that contributes to the human functions through the activities of the improvement of living conditions - labor, rest, everyday life.

Components of CHL contain various elements relating to all health spheres - physical, mental, social and spiritual. The most important of them - food (including the consumption of high-quality drinking water, the required number of vitamins, trace elements, proteins, fats, carbohydrates, special products and nutritional supplements), life (housing quality, conditions for passive and active recreation, level of mental and physical safety), working conditions (safety not only in physical, but also mental aspect, the presence of incentives and conditions of professional development), motor activity (physical culture and sports, use of means of various recovery systems aimed at raising the level of physical development, supporting it , restoring forces after physical and mental loads).

For awareness of the CHL important knowledge and possibility of access to special preventive procedures, which must slow down the natural process of aging, the presence of appropriate environmental conditions, other components of the CHL, which relate mostly not only physical and mental, as well as social and spiritual health.

The problem of forming a healthy lifestyle is very carefully covered in many socio-philosophical, pedagogical, sociological, medical works. Particular actualization this problem has acquired in the second half of the twentieth century as in the world as a whole, as well as in Ukraine.

Indicators of physical health. In accordance with the content of physical health (individual peculiarities of the anatomical structure of the body, the course of physiological functions of the body in different conditions of calm, movement, environment, genetic heritage, the level of physical development of organs and systems of the organism), indicators of growth and weight, as they reflect (with certain restrictions) defects (or their absence) of anatomical construction of the body and (also with certain restrictions) the quality of genetic heredity.

Regarding the performance indicators of the physiological functions of the body under different conditions of calm, movement, the environment and the level of physical development of bodies and systems of the organism, they can not be determined by the toolkar of sociological survey because the laboratory physiological testing of the organism systems that provide motor actions (muscle , nervous, power supply). Therefore, indicators were selected that indirectly indirectly indicate the nature of the body's reaction to physical activity and are available for objective determination in the survey: injury indicators, as well as the fact and capacity of physical activity, typical of conventional motor activity. These indicators can be considered (with certain restrictions) as readiness indicators for loading, that is, as mediated indicators of physical health.

Indicators of mental health. According to the content of this health (individual peculiarities of mental processes and properties - excitement, emotionality, sensitivity, tendency to stress, affects, features of thinking, character, abilities, needs, interests, motives, incentives, installations, goals, feelings, etc.) Relevant indicators were selected: the presence of communication problems, a sense of comfort of staying in the team, the nature of relations with close environment, the ability to manage its mental state, the degree of stress, the degree of self-satisfaction, that is, indicators that reflect the individual characteristics of the mental processes and properties of man. Direct dimension of such properties of the psyche as excitability, mental stability, level of emotionality, the purpose of sensitivity, stability of incentives, involvement in a certain psychotype, etc., was not carried out because it is impossible to carry out means of a sociological survey.

This requires special psychophysiological studies of each individual in laboratory conditions using the appropriate equipment. That is why the choice of indicators was sufficiently diverse to maximize the scope of mental health by those means that are possible in a sociological survey.

Indicators of spiritual health. In accordance with the content of this area of health (attitude towards education, science, art, religion, morals, ethics; consciousness, mentality, life self-identification, assessment of their own abilities and opportunities), were chosen indicators that indicate anxiety (or its absence). The state of the factors of spirituality are generally accepted in society: religious, cultural, patriotic. The spiritual inquiries indicate the indicators of the choice of leisure content.

Involvement in the Institute of Education reflects the indicators of education, the nature of communication with educators. Naturally, the list of indicators did not include those directly directed to determining the level of consciousness of respondents or the degree of commitment to the generally accepted ethical code of mankind, as it is not possible to obtain objective information on such indicators.

Indicators of social health, related to economic factors, relations with the individual with structural units of society, were determined by such indicators, as characteristics of the nearest environment and interactions in it, social status, social well-being, availability (absence) of safety in society, degree of satisfaction with everyday conditions of life, self-esteem of welfare, profits, opportunities and cost structure, housing conditions, opportunities.

Possibilities of realizing a healthy lifestyle. The question of the possibility (impossibility) to conduct a healthy lifestyle is extremely subjective, because it is primarily determined by the degree of awareness of the importance of action in this direction. Even in the absence of some objective conditions (comfortable housing, proper nutrition, sufficient income, etc.) of a high level of consciousness in relation to a healthy lifestyle seek to act for its own health.

Conversely, for quite objective conditions, the lack of personal incentives makes it impossible to be healthy.

On the other hand, there is a certain minimum of objective living conditions, which determines the possibility of implementing a healthy lifestyle. This welfare of the family, which indirectly characterizes the potential opportunity to realize a healthy lifestyle; The attitude of the nearest environment for health values is also a certain indicator of such an opportunity, because it is difficult to lead a healthy lifestyle with a negative attitude of friends and acquaintances; The degree of permanent stress and morbidity - a patient or a constantly mentally tense person is limited to the realization of healthy actions.

To objective languages include even the presence of shoes and clothes for exercising. It is due not to the fact that the possibility of physical culture and sports depends on the availability of equipment, but by the fact that young people need a fairly fashionable equipment, in order not to appear worse than peers.

Certain information about the subjective assessment of young people of existing restrictions on the possibilities of a healthy lifestyle give an indicator of concerns with physical education and sports, awareness of a healthy lifestyle, the state of the environment.

Possible means of influencing the formation of a healthy lifestyle. Given the need to implement health policy in a youth environment, issues of this implementation are one of the main ones. Consequently, the main components or components of health and healthy lifestyle are considered. But they are not equivalent.

In addition, there is no concept of quantitative measurement of "health" as a complex integral indicator. If informative methods are used to assess a person's physical health, which, depending on age, sex, physical condition, functional capabilities of the body, level of preparedness allow to assign each individual to one of the five levels of physical development, then for mental, spiritual and social health methods of quantitative estimates are still being developed.

*Socio-political environment.*Social and political dangers caused by life problems are very complex in nature. The essence of this nature is the accumulation of the consequences of constant, conflict, stress and other negative situations. In most cases, the danger is expressed in the ratio of the number of people involved in conflicts and separated from society in relation to the size of society itself.

Political dangers arise as a result of the development of various types of political conflicts. In the history of different countries, conflicts at the interethnic and interstate levels most often occur as a result of spiritual oppression, political terrorism, ideological, inter-party and armed conflicts, and wars.

Fundamentals of criminological security.

Ensuring the security of economic activity requires:

- clear legislation;

- establishment of appropriate mechanisms for the implementation of this legislation;

- use of experience of consequences of "work" of this legislation for maintenance of its improvement;

- creation of the appropriate infrastructure for its functioning and implementation of state policy "on the ground".

Thus, the danger factor characterizes the state of society, on the one hand, and on the other - is the content of the reason for its transition to a state with negative consequences.

Criminological criminal activity in the field of economics is most interconnected with many other types of criminal activity, so the most important today is the problem of economic security.

Criminological threat to the security of the economy - is a set of factors and conditions that pose a danger to the normal functioning of any objects of the economy.

Subjects of criminological threats to the security of economic objects are:

• special services of foreign states, whose activity is the extraction of valuable information, the implementation of subversive actions against the objects of the economy;

• non-governmental organizations and individuals specializing in industrial espionage;

• organized crime;

• individuals who perform illegal and other destructive intentions against the objects of the economy.

Criminological security provides protection of the main objects from encroachments of organized crime and industrial espionage.

The main subject of ensuring the safety of citizens, public organizations, associations, objects of the economy is the state, its legislative, executive, judicial authorities.

The main objects of criminological security:

• personality, its rights and freedoms;

• society, its material and spiritual values;

• the state, its constitutional system, sovereignty and territorial integrity.

Modern economic security of any country is a nationwide set of measures aimed at the sustainable development and improvement of the country's economy, which necessarily provides a mechanism for counteracting the criminological threats of criminal structures.

Economic security is a state of protection of vital interests of a person, a business entity, a country, the ability to choose ways and forms of economic development and implement them without outside interference.

Economic security *is a universal concept that concerns the protection of business entities at all levels - from the state to every citizen. Therefore, increasing*

the number of enterprises with a high level of economic security, its resilience to possible threats will help strengthen the economic security of Ukraine.

Transformational transformations in the economy of Ukraine are accompanied not only by the formation of new production opportunities, but also by changes in relations in other spheres of life. The transition to market relations is characterized by political, economic and social crises.

As a result, as a rule, negative phenomena took place in the economy: unfair competition spread, crime increased, and the share of the criminal-shadow sector of the economy increased. Under these circumstances, businesses are increasingly subject to various threats. Therefore, it is objectively necessary to protect business, aimed at counteracting such threats.

Economic threat - the possibility of intentional or unintentional action, which violates the functioning of the enterprise (firm), causes material or moral damage, removes from a state of stable equilibrium

Such threats are realized in the form of corruption, fraud, unfair competition, use of inefficient production technologies and so on. Physical threats are manifested in theft, robbery, breakdowns, equipment failure; intellectual - in the disclosure or misuse of information, discrediting the company, as well as various socio-psychological conflicts around banking institutions or in them.

Business security is closely linked to risks, which are an integral part of the market economy and a potential source of profit or expense.

Business security is aimed at eliminating or reducing the risk of economic losses. The source of threats to entrepreneurship can be tangible and intangible assets, finance, information, personnel.

According to the areas of threat, there are certain types of security:

1) material and technological security (MTS) - protection against possible losses due to theft of real estate from possible losses due to theft of real estate, equipment, products, inventions, programs, etc., possible losses due to accidents, disasters due to obsolete equipment, low qualification and irresponsibility of employees ;

2) financial security (FS) - protection against possible financial losses and prevention of bankruptcy. It is leading and decisive;

3) information security (IS) - protection of confidential information, prevention of its leakage, protection of software products;

4) personnel security (PS) - prevention and reduction of the danger of negative impact on economic security due to the actions of insufficiently qualified employees, inefficient business management, protection of individuals (life and health) from criminal encroachments.

In practice, all these types of security are carried out by the security service (security), which organizes the access regime, protection of buildings, structures, premises, equipment, protects information from unauthorized access, ensures the confidentiality of documents and materials.

A special place in the structure of entrepreneurial activity is occupied by banking, which is increasingly under the influence of criminal structures. With the introduction of market relations, it becomes a central link in the field of financial and

economic relations. However, in addition to legal commodity and financial flows, capital is "laundered" through the banking system, it is the main executor of the issue of non-cash payments of fictitiously generated funds.

The following factors contribute to the commission of mercenary crimes in the field of banking:

- socio-economic (disruption of economic ties between deeply integrated enterprises, imbalance of the financial system, the crisis of payments, etc.);
- organizational and managerial (lack of specialists in the field of methodology development, organization of banking activities in the new economic conditions, uncertainty of the concept of structural construction of the control system, relations of commercial banks with the NBU, law enforcement and other regulatory authorities);
- normative-legal (imperfection of the current legislation and departmental normative-legal acts on the issues of regulation of the sphere of banking activity).

Business security issues in countries with developed market economies are considered one of the main, and security measures in commercial structures spend from 10 to 15% of profits.

A prerequisite for effective protection of business activity from criminal encroachment is the identification and study of the circumstances and conditions that precede the commission of crimes. Only a comprehensive and multifunctional approach can identify and develop targeted measures to prevent the criminalization of the economy.

Extreme situations of criminogenic nature and ways to avoid them.

Global crime is another social problem of our time. The number of crimes registered in the world is growing by an average of 5% every year. But recently, the share of those who belong to the category of serious (murder, violence, etc.) is growing especially fast.

According to statistics, crime in Ukraine has become widespread. In conditions of economic crisis, uneven social development, a sharp decline in living standards, significant gaps in legislation and other negative factors, the number of people prone to crime is increasing.

Given the difficult criminogenic situation in Ukraine, everyone should be able to defend themselves in situations involving violence.

The cheapest and most affordable means of self-defense is a gas canister. No permission is required to purchase it.

To purchase, store and carry gas pistols and revolvers, as well as ammunition for them, you must have a special permit from the police.

Pneumatic weapons can be a means of self-defense, but they are still cumbersome and most importantly - there are no laws governing its use as a means of self-defense.

Autonomous signaling devices are a very effective means of self-defense. Their application is very simple: you pull out a dart - a keychain. A bag or a diplomat starts making such loud and piercing noises that any intruder will be afraid to deal with you further, without attracting public attention.

If a person is unable to purchase a weapon for self-defense or is unable to use it, you can use simple daily advice on personal safety:

• Keep money and valuables with you; briefcases, handbags should not be left unattended;

• in a cafe or bar, before hanging a coat on a hanger or back of a chair, take money and documents;

• carry a bag on a belt over his shoulder, pressing it to himself;

• do not open the door to strangers (or keep them on a chain); to check service certificates for officials;

• returning home late in the evening, walk down a lighted and crowded street; in the evening be careful in transport, driveway, elevator;

• avoid situations that threaten violence (dispute with drunks);

• do not get in the car to strangers.

In the event of an attack, you should shout as loudly as possible or break the glass of the nearest apartment or shop.

The strictest punishments under the Criminal Code of Ukraine are for murder and rape. Sexual crimes due to severe physical and psychological consequences for victims are particularly serious. For some types of rape, Article 152 of the Criminal Code of Ukraine provides for imprisonment for up to 15 years. However, victims usually do not report the police because they do not want publicity, the experience of an unpleasant investigation and trial. According to the results of sample research, for each rape under investigation there are 6-8 crimes that go unpunished. To reduce the risk of rape, follow these rules:

• not to provoke violence by your appearance and behavior;

• avoid remote beaches, places for country rest, etc., do not walk in the evenings through yards, parks and squares.

• Avoid places where adolescents gather, as rapes committed under the influence of alcohol or drugs by minors are particularly brutal.

• Try to establish contact with the criminal, that is, make him think of a woman as a person, not a sexual object; use tricks to try to lure the rapist to a place where there is potential protection;

• in case of an attack, you can use physical resistance - to strike painful places (groin, face, eyes). Beat with the knee or elbow;

• Shout loudly (it is better to shout "fire" than "rape").

In the case of an attempted rape, the victim may tell the perpetrator that he or she has a sexually transmitted disease (AIDS, syphilis, gonorrhea, etc.).

Therefore, extreme criminogenic situations can be avoided or their risk minimized by following personal safety rules.

Personality manipulation

Man is not only a natural, biological being, but also a spiritual person with a complex inner world. She or he is endowed with reason, abstract thinking and language. All complex systems can be influenced by programming human behavior through manipulation.

Manipulation (lat manipulus - a handful) - the impact on a person (usually hidden) in order to achieve actions that meet the goals of the manipulator, give him certain advantages and benefits.

Such influence can be exerted both on large communities and on the individual. To influence the public consciousness, certain technologies have been developed that are used in various fields, and most often in politics and advertising.

Manipulative influence in the processes of business communication. First of all, manipulations in communication are based on such a mental process as decision making. This is the choice of available alternatives. The peculiarity of this process is that it always compares something represented by consciousness, not what is outside it.

If the task is to control consciousness, then the person is offered the arguments that are needed by the suggestor, that is, who will try to manipulate in the form of suggestion.

Different approaches to suggestions are known.

Psychoanalytically-oriented approaches:

Our consciousness is programmed laterally, ie indirectly (lateral - transverse, horizontal, lateral, secondary, one that is on the side). This mechanism is widely used both in the practice of ideological influence and in the practice of business communication. It is called the mechanism of lateral programming of the psyche. Strong reflection in the memory of "obvious" things is the essence of lateral programming of the psyche. When a person is confidently told what seems self-evident, which does not require proof of fact, he often loses the ability to critically assess the situation. Lateral programming affects a person's behavior directly, ie both his consciousness and his will. The main thing in laterally constructed expressions always remains as if from the side and is perceived by people as something obvious. There is allegedly a second or double meaning in the statements, which is practically not perceived and realized, it is not prone to reflection, while the main topic of conversation a person is subjective, agreeing or disagreeing with the interlocutor.

Hypnotic approach: Suggestion is a process of action on the human psyche, associated with a decrease in consciousness and critical perception of the content, which is perceived as if it does not require a detailed personal analysis or assessment of the motivation for certain actions. The essence of suggestion is to act on a person's feelings, and through them - on his will and mind. It should be borne in mind that different people have different degrees of suggestion. Psychologists say that suggestibility depends on a number of factors, which include:

- uncertainty;
- timidity;
- low level of self-esteem;
- vulnerability;
- weakness of logical analysis.

Suggestion techniques are the specificity and imagery of keywords. The use of words whose meaning is specific, the meaning of which is easy to imagine, significantly increases the effect of suggestion. Abstract concepts dramatically reduce the power of suggestion.

One of the strongest means of suggestion is language dynamics. The main techniques of speech dynamics that can increase the suggestion of language:

- softness and strength of voice;

- richness of intonations;
- pauses;
- high rate of speech.

It is believed that the impact of this tool is higher on people with a high level of intelligence and, accordingly, cause more confidence. According to the observations of psychologists, during business communication with a large audience, a person who will use a male voice, especially a low, "velvet" one, will take a more advantageous position.

The ability to purposefully influence a person, his emotions with the help of certain words and phrases have been known since ancient times. Some of them are able to evoke not only certain emotions, but also subconsciously perceived in the form of psychological images.

There are many techniques for inducing a trance, which are used both in general in the management process and during business communication: showing trance behavior; age regression; use of natural trance states; overload of consciousness; pattern break; use of complete uncertainty, unpredictability; use of artificial or non-existent words; scattering technique; perseveration; appeal to

Topic. Quantitative and qualitative hazard assessment.
Practical class No.1. Statistical evaluation of dangerous and harmful factors for human life

Objective. To become familiar with the general concepts of risk - quantitative assessment of risks; learn to identify the different types, levels and categories of risk, as well as statistical evaluation of dangerous and harmful factors for human life.

Task:

1. Defining the types, levels, various categories of risk situations (part 1).

2. Statistical evaluation of dangerous and harmful factors for human life (part 2).

Part 1.

General provisions

1.1.General assessment and characteristics of hazards

The result of a display of the dangers are the accidents, disasters. They are accompanied by deaths, reduced life expectancy, damage to human health or the environment, etc.

Consequences or quantification of damages, caused by the danger, depend on many factors, such as the number of people, located in the danger zone, the quantity and quality of material values placed there, natural resources, perspective areas, etc.

In order to standardize any consequences are defined as damage. Each individual kind of damage has its own quantitative determination. For example, the number of dead, wounded or diseased, the area of infected territory, the area of forest that had burned, the cost of destroyed buildings, etc. The most versatile method of quantitative determination of an injury is valuable; hence, its establishment in monetary equivalent.

Another, not less important characteristic of a danger, more specifically, the level of possible hazard, is the frequency with which it can occur, or the **risk**:

Risk (R) is defined as the ratio of the number of events with undesirable consequences (n) to the maximum of their number (N) for a specific period of time

$$R = \frac{n}{N}$$

The given formula allows you to calculate the size of the total and group risk. While assessing the ***total risk,*** value N determines the maximum number of the events, and while assessing ***group risk*** **-** the maximum number of events in a particular group, selected from the total number according to a particular feature. In particular, the group may include people belonging to the same profession, age and sex; group can comprise of vehicles of the same type; one class of economic activity [1].

Tasks for independent work.

Example 1: *The town is a residence to 35 thousand of people. There operates a chemical plant, which employs 3,000 people. An accident occurred - 67 people wounded; 5 - died; poisoned by the chemical vapor 140 residents. Calculate the total and the group risk of the affected people.*

Example 2. *In the farm, which owns 800 hectares of forest, a fire occured. 45 hectares of forest were burned. Calculate the total and group risk of the occurred*

event. (Total forest area in Ukraine - 9.6 million ha; in the Kyiv region - 800 thousand ha).

1.2. Levels and categories of hazards

To determine the seriousness of the hazards, there are different criteria. Categories of the hazards' seriousness presented in Table 1.1, establish a quantitative value of the relative seriousness of the possible consequences of hazardous conditions. The application of categories of the hazards' is very useful for determining the relative importance of taking preventive measures to ensure life safety. For example, a situation, belonging to the category I (catastrophic hazard), requires more attention than those, categorized IV (minor hazard).

1.1. Criteria for hazards' seriousness

Type of hazard	Category	Description of an accident
Catastrophic	I	Death or destruction of the system
Critical	II	Serious injury, sustained disease
Limited	III	Minor trauma, shorttime disease
Insignificant	IV	Less significant injuries, disease than those categorized III

1.2. Levels of hazard probability

Type	Level	Description of the consequences
Frequent	A	High chances are that the event will be held
Probable	B	It may happen several times during a lifetime
Probable	C	Sometimes it can occur during a lifetime
Remoted	D	It is an unlikely, but possible event
Impossible	E	So much unlikely that it can be assumed that the hazard will never occur

The levels of hazard probability is a qualitative reflection of the relative probability that undesired event, which is a result of uneliminated or uncontrollable hazard. Based on the high probability of hazard of any system, we can come to a conclusion concerning specific types of activity. Therefore, using both methodologies for determining the likelihood and seriousness of the hazard, the hazards can be determined, assigned to a certain class and solved, as based on the seriousness of the hazards' potentially possible consequences, if any occur.

1.3. The concept of reasonable (acceptable) risk

According to the degree of risk acceptability is rejected, affordable, maximum allowable and excessive.

1. Rejected risk level is so small that it is within the tolerance of the natural (background) level.

2. An acceptable risk is considered the one that society can accept (allow, permit), including technical, economic and social opportunities at this stage of development.

3. Maximum allowable risk is a maximum risk, which should not be exceeded despite the expected result.

4. Excessive risk is characterized by exceptionally high level, which in most cases leads to negative consequences. Rejected risk today is also impossible to be provided due to the lack of technical and economic prerequisites for this. Therefore, modern life safety concept is based on achieving a reasonable (acceptable) risk.

It is easy to see that a serious hazard may be acceptable if its probability is very low, as well as the probable event can be proved that its result is insignificant. These considerations give reasons to believe that the probability of the hazard risk is inversely proportional to its seriousness.

1.3. Risk Assessment Matrix

The frequency with which an event occurs	Hazard category			
	I. Catastrophic	II. Critical	III. Limited	IV. Insignificant
(A) Often	1A	2A	3A	4A
(B) Probably	1B	2B	3B	4B
(C) From time to time	1C	2C	3C	4C
(D) Remoted	1D	2D	3D	4D
(E) Impossible	1E	2E	3E	4E
Hazard risk index				

Risk classification	Risk criteria
1A, 1B, 1C,2A, 2B, 3A	Unacceptable (excessive)
1D, 2C, 2D, 3B, 3C	Undesirable (the maximum allowable)
1E, 2E, 3D, 3E, 4A, 4B	The permissible with verification (acceptable)
4C, 4D, 4E	The permissible without verification (neglected)

Table 1.3 shows an example of the hazard risk matrix, which includes elements of tables 1.1 and 1.2 in order to provide an effective tool for approximating the acceptable and unacceptable levels of risk or probability for each category of seriousness and probability, to deeper classify and assess the risk according to its degree. The use of this matrix facilitates the assessment of risk.

Tasks for independent work.

Example 1. *Carbon monoxide caused three people poisoned. Owing to the timely assistance provided people could be rescued. Determine the category of seriousness of hazard.*

Example 2. *The collision of aircrafts in the air. Identify classification and and criteria for this event accrding to the hazards risk.*

Example 3. *Define the risk level of person's crossing the road on a red light.*

Example 4. *Identify risk from lightning hitting a person.*

Example 5*. Car accident on the road. 2 people died, 3 injured. Calculate the total and group risk and identify the classification and criteria of the event according to the hazards risk index (based on the statistics, in 2010 4,7 thousand people died, 40 thousand were injured on the roads of Ukraine).*

Example 6. *Calculate the numerical value of the total risk of household accidents with fatal consequences. According to the statistics, in 2010 73111 people died in the domestic sphere in Ukraine. Identify classification and criteria of this dangerous situation according to the hazards risk index.*

Part 2

Task. On the basis of sociological approach, conduct statistical evaluation of hazards to human life, using a point scale system.

Students are offered to assess the hazard to a life of a resident of Ukraine of 35 factors listed in Table 1.4, according to the following scale: the most dangerous factor (according to the students' opinion) is estimated at 35 points, and then 34, 33, 32 and until the last one, which is considered the least dangerous – 1 point.

Of course, having unequal life experiences, students assess the hazard of a factor differently, hence, the obtained results should be statistically processed. Each factor is calculated with the number of points provided by the students, that amount is divided by the number of students surveyed and the obtained value is the average rating of a danger factor: the higher it is, the more dangerous the factor is. Central hazard assessment of j- factor of Śi is defined by the formula

$$\acute{S}_{i\,j} = \sum_{i=1}^{n} S_i / n ,$$

where Si j are individual assessments of the students for j factor, n - the number of students surveyed. If we assume that the factors listed include all dhazards to a human life, we can also assess the relative proportion (percentage) of each factor qj in the total number of undesirable consequences according to the formula

$$q_j = \frac{S_{i\,j}}{630} \times 100 = \frac{\acute{S}_i}{6{,}30} , \%$$

The results are put in Table 1.4.

1.4. Statistical evaluation of hazards and harmful factors for human life

#	Factors	Individual assessment, Si	The average assessment, Si j	The relative share qj
1	2	3	4	5
1	Air transport			
2	Automobile transport			
3	Nuclear energy			
4	Unemployment			
5	Consumption of alcoholic drinks			
6	Industrial injuries			
7	The use of low-quality food			
8	Lack of necessary food products			
9	Killings and intentional injury			
10	Ponds (swimming, rest)			
11	Diagnostic radiation			
12	Electric current			
13	Railway transport			
14	Infections			
15	Smoking			
16	Medicines			
17	Narcotic substances			
18	National conflicts			
19	The presence of radioactive substances in the air, water, soil			
20	The presence of radioactive substances in food products			
21	The presence of chemicals in air, water, soil			
22	The presence of chemicals in food products			
23	Domestic injury			
24	Increase of prices			
25	Fires			
26	Suicide			
27	AIDS			
28	Sports and mass events			
29	Natural disasters			
30	Personal issues and concerns			
31	Terrorism			
32	Food poisoning			
33	Surgery			
34	Diseases associated with the presence of radioactive substances in the environment			
35	Diseases associated with the presence of chemicals in the environment			

To sum up, we note that the accuracy of this assessment increases with the number of respondents, depending on occupation, age and gender of the person.

It is important to note that the awareness of the existence of dangerous and harmful factors for human life is only the first step to a secure life. It is necessary to establish the conditions under which these factors cause unwanted effects and avert the possibility of these conditions.

Topic 2 . Natural hazards.

Defining the level of meteosensitivity of a human

Objective. Learn how to define the level of influence of the weather on human activity and get acquainted with the activities and means of prevention of meteotropic reactions.

Tasks:

1. Learn basic information about the dependence of state of health and working capacity on the weather and meteorological factors.
2. Define the level of weather pathogenicity and its irritant effect, assess the impact of complex weather and meteorological factors on the human organism (task 1).
3. Provide assessment of the own meteosensitivity (task 2).
4. Define individual meteosensitivity (task 3).
5. Analyze findings and give recommendations for prevention meteotropic reactions.

Terms

1. Dependence of state of health and **working capacity on** the weather and meteorological factors**.**

The weather is a physical state of the atmosphere that occurs under the influence of solar radiation and circulation processes in the atmosphere and the underlying surface. The weather is a holistic formation of the nature, complex interaction of the weather and meteorological factors.

The weather and meteorological factors include temperature, atmospheric pressure, humidity, cloud amount, precipitations, wind, as well as electric state of the atmosphere. A special place is given to the changes of the electromagnetic field of the Earth - magnetic storms.

In addition, an important role in shaping the weather is played by the circulation processes in the atmosphere arising with a temperature difference of the Earth's surface at different latitudes, and among continents and oceans. The temperature difference in high and low troposphere layers and Earth's rotation that deflects airstream are reflected on the weather and are of great importance.

Airstreams interact while moving,. Limits of distribution of air masses, especially where there are changes in the weather factors, called fronts. There are arctic, polar and tropical fronts. There are also cold fronts, warm and occluded front. Front occlusion is a complex front, which is formed by closing of the cold and warm fronts.

The frontal activity is related to non-periodic variability of the daily temperatures, cloudy and rainy days prevail. The electrical properties of the atmosphere also change. The front zone with low pressure is called cyclone. Zone with the increased

pressure is anticyclone. All these weather phenomena can cause dramatic changes in the human organism.

The nature of the impact on a human is classified by the reactions to the weather and meteorological factors that occur in the body. Depending on favorable or unfavorable effects on the human organism the weather from zero (completely comfortable weather) to a five-point (extremely uncomfortable) are distinguished.

Comfortable type of the weather is between 4 to 36%, and unfavorable from 32 to 48% of the number of days in a year.

Now the connection between fluctuations of the weather conditions and the emergence of adverse reactions of the organism up to serious illnesses and death, the influence of the weather on mental and physical capacity is proven.

Adverse weather effect on the human organism is assessed on the grounds of the following indicators: the level of pathogenic effect of the weather, the effect that causes disruption of the normal human condition is set on the basis of the general pathogenicity index forecast. It is defined as the sum of the components of the pathogenicity indices for individual indicators:

$$J = i_t + i_h + i_v + i_{\Delta p} + i_{\Delta t},$$

J – the general index of pathogenicity; i_t – pathogenicity index of the temperature; i_h – pathogenicity index of humidity; i_v – pathogenicity index of wind speed; $i_{\Delta p}$ – pathogenicity index of the changes in the atmospheric pressure; $i_{\Delta t}$ – pathogenicity index of the changes in the air temperature.

Components of the pathogenicity indices are calculated by the following formulas.

Pathogenicity index of the temperature: $i_t = 0{,}2\,(18 - t)^2$ with $t \le 18°$,

$i_t = 0{,}2\,(t - 18)^2$ with $t \ge 18°$

,

t – the average daily temperature in °C.

Pathogenicity index of the humidity: $i_h = \frac{10 \times (h - 70)}{20}$ with $i_h \ge 70$,

$i_h = \frac{10 \times (70 - h)}{20}$ with $i_h \le 70$

h – the average daily humidity in %.

Pathogenicity index of the wind speed: $i_v = 0{,}2 \times v^2$,

v – the average daily wind speed in m/s.

Pathogenicity index of the changes in the atmospheric pressure: $i_{\Delta p} = 0{,}06\,(\Delta p)^2$,

Δp – inter-day average daily change of the atmospheric pressure in mm of the mercury column/day.

Pathogenicity index of the air temperature: $i_{\Delta t} = 0,3\ (_{\Delta}t\ )^2$,

$_{\Delta}t$ – inter-day change of the average air temperature in °C / day

The pathogenic effect of the weather is classified on a scale (tab. 2.1)

2.1. Scale of the weather pathogenicity

Value J	Assessment of the weather pathogenicity
0 – 9	Optimal
10 – 24	Irritant
25 and more	Acute

The degree of the weather irritant effect is established from the interrelation:

$$R = 0,6 \times J,$$

R – degree of the weather irritant effect; J – general index of pathogenicity.

To assess the complex effect of the weather and meteorological factors on the human organism using the coefficient of the weather severity (S).

The coefficient of the weather severity is calculated by the formula:

$$S = (1 - 0,006\ t\ )\ (1\ +0,272\ v\ )\ \text{Kv Ka}.$$

S – severity of the weather for the day, points*; t* - the average daily temperature,°C;

Kv – relative humidity coefficient, which is 0,9 for humidity less than 60; 0,95 for 61-70%; 1,0 - to 71-81%; 1,05 - to 1,1% and 81-90 - for humidity greater than 90%;

Ka – coefficient, taking into account the role of daily variability of the temperature; it equals, in case of variability to 4°C - 0.85, from 4,1°C to 6°C - 0,90, from 6,1°C to 8°C - 0,95, from 8.1 to 10°C - 1 00, from 10,1°C to 12°C - 1,05, from 12,1°C to 14°C - 1,1, from 14,1°C to 16°C - 1,15, from 16,1°C - 18°C - 1.20;

v – the average daily wind speed, m/s.

The higher the coefficient of the severity of the weather S, the more significant the defection of physiological systems, the stronger the influence of weather and meteorological factors on the human organism.

2. Meteosensitivity of the human and methods of its determination

The weather and meteorological factors affect the organism not by the separate elements, but by the totality of their properties, their effect is not total, but integrated.

The main factors that contribute to the occurrence of different reactions of the organism to the change of the weather conditions, are the human susceptibility to the weather irritants or meteosensitivity.

Meteosensitivity is both common and the most essential for the organism to coordinate physiological property of their vital functions with the rhythms of the biosphere. The response of the human organism to the change of the weather and meteorological factors is a normal physiological response aimed at improving the living material, to support harmony with the world, which is constantly updating.

Pathological reaction of the organism to the changing weather should be distinguished from a physiological meteosensitivity. Pathological response called “metedependance” or “meteopathy”. It may be hereditary (passed from parents to children), and can occur as a result of the great exhaustion, illness, in stress situations, where adaptive reserves of the principal life supporting systems do not have time to prepare the organism to extreme weather situations. Such disharmony with nature at each new outbreak of the weather changes can grow and become one of the main mechanisms for the formation of chronic pathologies.

Meteopathic response are felt subjectively and objectively by the organism, which is displayed by the poor health state, headache, insomnia, increase or decrease of blood pressure, spasms of the coronary and cerebral vessels, in the mental discomfort, worsening of metabolic, immunological and other processes.

Meteopathic reactions of the organism can be joined into the following groups:

1) rheumatoid are displayed by the muscle pain, general fatigue, inflammatory phenomena in peripheral nerves, etc.

2) cardiac are displayed by the pain in the heart, cardiac arrhythmias, etc.

3) catarrhal are displayed by the disorders of the gastrointestinal tract;

4) cerebral are characterized by the increased irritability, general excitement, insomnia, headaches, head congestion, nosebleeds, breathing disorder, negative emotional state, etc.

Meteotropic reactions most often occur in sick people. But about 40% of the healthy people also feel, dependending on changes in weather and meteorological factors. This dependence 20% of them notice in their close relatives, which may indicate a hereditary mechanism of meteosensitivity. In addition, meteosensitivity of the cities residents is in 1.5 - 2 times higher than that of rural residents. This is due to the fact that city residents are less adapted to fluctuating velocity and air temperature, humidity and other meteorogical factors.

The degree of display of meteopatic reactions are divided into three groups:

1 – weakly expressed reactions, mainly characterized by the subjective symptoms without intoxication;

2 - medium expressed reactions: the objective symptoms of intoxication include fever within 3 - 5 days;

3 – strongly expressed reactions that occur in hypertensive crises, angina attacks, astma-like state, etc.

Reaction of the organism to the effect of the weather and meteorological factors caused by the changes in the state of the autonomic nervous system. To assess its functional status the vegetative Kérdö index is used. It is derived from the pressure and heart rate and is calculated by the formula:

$$\mathbf{K}=\{\frac{1-d}{p}\}\times 100\%,$$

d – systolic blood pressure, mm of the **mercury column**; p – heart rate, beats per minute.

Normally, the ratio d/p ≈ 1 and vegetative index is close to zero. In case of the benefit of parasympathetic tone of the autonomic nervous system, the index has a negative value. If the sympathetic tone of the autonomic nervous system benefits it is

positive. The greater the deviation, the more expressed is the benefit of one of the parts of the autonomic nervous system and, hence, the greater meteosensitivity is.

3. Recommendations for the prevention of meteotropic reactions

In the development meteotropic reactions the important role is played by the central nervous system. It was found that the most complete human adaptation to the effect of the weather factors is displayed at a higher functional activity of the right hemisphere of the brain. This hemisphere is responsible for the formation of emotions. It dominates in controlling the aggressive behavior.

It is the understanding of the role of the right hemisphere of the brain in the development of adaptive responses to changing weather conditions, which is based on a number of advice-based prevention meteotropic reactions, primarily in the psycho-emotional sphere.

It is recommended on the eve of the predicted adverse weather condition to be involved into any kind of creativity, like drawing, displaying with bright colorsof the sunny morning, flowers, wood, etc. The drawing has to include as much colorful tones as possible. No matter if the picture will not be an artistic masterpiece.

The same effect on the function of the right hemisphere of the brain, as painting does, have the invented by professor A.P. Churikov with his employees rose-colored glasses. They are named the FILAT glasses. They combine simultaneous use of bright lights and filters with certain physical characteristics. With the help of these glasses the mood may improve, the pace of thinking may increase, to calm down, to adjust to sleep disorders. Their use by the meteodependent persons caused positive effect in 80% of the patients.

Thus, the most important during the critical weather conditions is the removal of the emotional stress. This can prevent hypertensive crises, angina attacks, reduce the risk of strokes, reduce the number of suicides. Along with the above-mentioned it is possible to use methods of emotional discharge: autogenous training and meditation.

For many people phototherapy may be useful. Its action lies in enhancing of the brain with bright white or dull red lights. This method was suggested by the experts of the National Institute of Mental Health of the USA. The best effect this method brings to the individuals tend to eat a lot of carbohydrate foods in the afternoon. Therefore it is recommended not to begrudge light at work in cloudy days and at night. Light can replace the use of the drug melatonin or vitamin B12. However, the use of these preparations is dangerous because it can disrupt the circadian biorhythm of an individual.

Another preventive measure is a balanced diet. Meteosensitive people are recommended to supplement the diet with foods rich in antioxidants, i.e. substances that inhibit the oxidation of fats. The natural antioxidants include fresh oils, cheese, chokeberry, germinated oats, fresh vegetables, etc. At the same time the diet excludes fried foods, alcohol. In addition, the diet is recommended to be shifted to protein and fat type, and during dangerous days the caloric diet should be significantly reduced.

This group of preventive measures includes complex treatment with the preparations that have antioxidant properties. After a month of treatment meteotropic reactions do not occur within six months in 80% of patients.

Task 1. Determine the level of weather pathogenicity and its irritant effect, assess the impact of complex the weather and meteorological factors on the human organism.

The work must be performed in the following order.

1. Fill in the table 2.2 with the data on the weather and meteorological factors that the teacher reads.

2.2. Weather and meteorological factors

Factor's title	*Factor's Measurement*								
	For the previous day _____(date)			*Average daily*	*On the day of the experiment _____ (date)*			*Average daily*	*Inter-daily difference*
	Measurements				*Measurements*				
	1	*2*	*3*		*1*	*2*	*3*		
Temperature ^{0}C									
Wind speed, m / s									-
Humidity, mm									-
Atmospheric pressure, mm of mercury									

2. Calculate the measurement of the average daily temperature, humidity, wind speed, atmospheric pressure.

3. Calculate the measurement between the daily changes in the atmospheric pressure and temperature.

4. Calculate the components of the pathogenicity indices of temperature, humidity, wind speed, atmospheric pressure changes and temperature changes according to the formulas.

5. Calculate, on the basis of the constituents of the pathogenicity index, the overall pathogenicity index of the forecast.

6. Perform, on the basis of measurements of the total pathogenicity index, the assessment of the weather pathogenic effect on humans according to the scale (Table 2.1)

7. Determine the degree of the weather irritant effect.

8. Calculate stiffness forecast and execute a comprehensive assessment of the action weather and meteorological factors on the human body.

9. Fill in the table 2.3. with the results.

Conclusion: _____,

The weather reveals_____

effect (pathogenicity level)

2.3. Defining the level of pathogenicity, irritant effect and rigidity of the weather

Components of the pathogenicity indexes					Total pathogenicity index of the weather , J	Degree of the weather irritant effect, R	The level of the weather pathogenicity (optimally irritant or acute)	Coefficient of the rigidity of the weather , S
Air temperature, i_t	Air humidity , i_h	Wind speed , i_v	Changes in air the temperature, $i_{\Delta t}$	Changes in the atmospheric pressure, $i_{\Delta p}$				
1	2	3	4	5	6	7	8	9

Task 2. **Evaluate own meteosensitivity.**

Conduct the work in the following order. Fill in the questionnaire. Answer each question "yes" or "no". Calculate the amount of points with "yes" answers. Make the meteodependance conclusion on the basis of the comparative Table 4.

Calculation of the total score allows you to get the subjective evaluation of one's own meteodependance, and conclude on the necessity for the measures to reduce metedependance.

Questionnaire

Scores

1.Chy you feel the differences in different periods of the year (yes / no) at:
a) general state 20
b) mood 5
c) working capacity 10
d) state of health 20
2. Do you notice a relationship with the weather changes (yes / no):
a) general state 20
b) working capacity 10
c) mood 5
3. What subjectively reveals as the impact (yes / no) of the "bad" weather:
a) weakness 10
b) sleepiness 5
c) bad mood 5
d) headache 15
e) dizziness 25
e) other ailments (which) 20
4. What weather has the greatest impact on you (yes / no):
a) rainy 10
b) windy 10
d) hot 10
e) cold 10

e) dry _____10
h) with high humidity _____10
c) other (which) _____10
5. Do you fell future changes in the weather (cross the odd one out):
a) yes _____20
б) no _____0

Total points	Level of meteodependance
0-25	Resistant
26-50	Low
51-100	Threshold point
101-150	High
More than 151	Very high

QUESTIONS:

1. What is the essence of “life safety”? In science achievement which it is based?
2. Specify the basic principles of excreta.
3. What is the United Nations concept of sustainable development mankind?
4. What are the main tasks of the science of human security?
5. In what way calculated the index of human development?
6. Provide a definition of the concepts of "life" and "activities".
7. What are the main problems of life support.
8. Identify and classify the dangerous factors.
9. Name subgroups physical factors of danger.
10. What factors forms chemical hazards.
11. Provide a description of biological factors danger.
12. Provide a classification physiological factors danger.
13. What is the risk to life safety?
14. What is the quantitative risk assessment?
15. What is the axiom dangers?
16. What are the different types of risk?
17. What kinds of environmental risk.
18. What methods of risk used in medical and environmental research?
19. Give the definition of man-made risk.
20. What is the social risk?
21. What is the calculation of social risk?
22. What are the signs of structure the social risk.
23. What is a subjective risk?
24. What are the different types of compensation acceptability of risk?
25. What is the qualitative characteristic of risk?
26. What is the statistical evaluation of dangerous factors?

Topic. Biological hazards.

Practical class No. 3. Infectious diseases. Epidemics. Pandemics. Immunity. Behavioral rules for population during conduction of isolation and restriction events. Prevention of infectious diseases

Objective: Study: the classification of infectious diseases and pathogens; behavioral rules for population during conduction of insulating-restrictive measures

Tasks:

1. To learn about infectious diseases and characteristics of some pathogens.
2. To learn the behavioral rules of the population during the insulating-restrictive measures.
3. To learn about the procedure of disinfection, with disinfectants and solutions.
4. Fill in table 3.1.
5. Describe the chosen infectious disease (the causative agent, the main symptoms, etc.)

General provisions

Over the past decade a wave of various infectious diseases covered the continents, states, millions of people and inflicted irreparable damage and greate mortality rate to the world. In 2000 flu in Ukraine pledged in big cities to stop classes in schools for a long time (in Kiev for two weeks), led to a partial breakdown of production and other activities.

Infectious diseases of people are divided into: individual cases of exotic and highly dangerous infectious diseases; infectious disease in humans with undetected disease etiology; epidemic outbreak of infectious diseases; group cases of infectious diseases; epidemics and pandemics.

To characterize the mass infectious diseases among the population the following terms and definitions are to be applied.

Biologically-social emergency is a situation, when in a result of the source of biological and social emergency in the defined territory, normal living conditions and health, the existence of farm animals and plants are violated, there is a threat to human life and health, threat of widespread infectious disease, loss of farm animals and plants.

Biological safety is a state to protect people, farm animals and plants, the environment from the dangers that are caused or will be caused by a source of bio-social emergency.

Specially dangerous infection is the infection status of human or animal body, which is revealed through the form of infectious diseases, progressing in time and space, causing severe consequences for human health and the farm animals or even their death.

Infectious disease irritant is pathogens that have evolutionary adaptation to parasitism in humans or animals and the potential to cause illnesses by the infectious disease.

Source of the infectious disease irritant is the body of an infected person or animal, which goes the natural process of keeping, breeding and release into the environment of infectious diseases.

Epidemic is a massive, progressive in time and space within the specified region people's infectious diseases spreading, which is much higher than the level of registered diseases in the given territory.

Epidemic center is the place of infection and people's staying, who got sick with the infectious disease and the area, within which over a certain period of time there is a possible contamination of people and livestock with the infectious disease.

Pathogenic viruses are the cause of many serious and dangerous diseases of humans, animals and plants. These include smallpox, foot and mouth disease, dengue and others.

Infectious diseases of people is a morbidity with pathogenic microorganisms and disease and is transmitted from an infected person or animal to a healthy one. Infectious diseases are revealed in the form of epidemic foci.

Epidemic process is called the process of the emergence and spread of the infectious diseases among people and which is a continuous chain sequence of homogeneous infectious diseases of people.

Epidemic disease or endemy is a constant registration in a particular territory of the morbidity, which is peculiar to the given area. Exotic disease morbidity is observed when the irritants are imported into the territory, which is free from this infectious disease.

Sporadic morbidity is a normal level of morbidity, which is inherent in the relevant disease area.

Epidemic explosion is called a sharp time-limited and defined-territory rise of the morbidity associated with the simultaneous infectioning of humans.

Morbidity is defined by the ratio of the quantity of morbidity in a given period of time to the number of residents of the given area, the city within the same period.

Mortality is the number of deaths from the given disease, which is defined by a coefficient to 100,000, 10,000 and 1,000 people, covered by the epidemic surveillance.

Ways of infectious agent's transmission are defined environmental elements or their combinations that provide pathogen transfer from the source to the surrpunding people in specific epidemic conditions.

There are the following ways of infection transmission from a human:

1. The contact-household path, when the disease is transmitted through objects that surround the patient.

2. Airborne droplets, when the infection is transmitted through saliva droplets that enter the air during the conversation, sneezing, coughing. Tuberculosis, influenza, whooping cough, diphtheria, measles, etc. may be transmitted the same way.

3. Transmission of the infection through the water into which the microbs get inside the organism (cholera, typhoid, dysentery, etc.).

4. Through the bites of blood-sucking arthropods (e.g. malaria).

5. Through contaminated food.

6. Through the soil: for example, intestinal diseases, tetanus.

3.2. Groups of infectious diseases. Depending on the general characteristic features of common infectious diseases associated with the localization of the

pathogen in humans and the mechanism of infection transmission, all infectious diseases are divided into 4 main groups:

- infections of the respiratory ways;
- intestinal infections;
- blood infection;
- infection of the outer covers.

Among infectious diseases a group of especially dangerous infections is distinguished:

1. Cholera
2. Cybirka
3. Plague
4. Tularemia

Classification of factors of infectious diseases and infestations that may occur in the agricultural sector is the following:

bacterial: tuberculosis, brucellosis, salmonellosis, leptospirosis, anthrax, lysteriosis diamond-skin disease, plague, tularemia;

viruses: rabies, psittacosis, cholera;

rickettsiosis: fever;

fungus: actinomycosis, blastomycosis, candidiasis, coccidioidomycosis, cryptococcosis, microspores, ringworm, histoplasmosis, epidermatomycosis;

animalculine: echinococcosis, teniasis, trichinosis.

To prevent diseases these diseases, the following preventive measures are to be conducted:

• preventive vaccinations;

• quarantine measures (under quarantine a set of measures to curb the spread of infection, including isolation of the previous patients, disinfection of the patients' residence, detect infection contact with patients, etc. Is understood);

• removal of sources of infection.

Behavioral rules of the population during the insulating-restrictive measures.

While the threat of natural centre of infectious diseases exists, it is necessary to know the clear ways and methods of population protection.

Infectious diseases centre is called a territory contaminated by pathogenic agents which is a source of the spread of infectious diseases: sometimes it is simply called the centre of the epidemic of infection.

The disease occurs not immediately but after a hidden (latent) period, which can last for days, weeks, and sometimes months, depending on the pathogen of the infectious diseases. Infectious diseases can be determined only through special laboratory studies and by analyzing the samples taken, which, of course, makes it difficult to timely acting. But if a mere fact of appearance of th infectious agent is confirmed, then the quarantine is immediately announced.

Quarantine is a system of temporary organizational, operational, restrictive, administrative, economic, health, epidemic, hygienic, therapeutic, and preventive measures aimed at preventing the spread of infectious disease and provision of localization of the epidemic, epizootic or epifiotic centres and their subsequent elimination.

When quarantine is announced, the following measures are taken:

1. The outer quarantine zone includes the guard, commandant service and patrols are organized.

2. Around the settlements and the objects, the local (internal) commandant service is organized, health infectious wards and hospitals, control and transmission points, etc. are carried out.

3. People, animals and property removal is prohibited from the quarantine area. The check out of the contaminated area is allowed to the civil defense chiefs only with special formation and means of transport.

4. Transit transport passing through the centres of contamination is prohibited (except for only railway).

5. Objects of economic activity, continuing their activities, move to a special work regime, in strict compliance with antiepidemic requirements. Workers of the shift are divided into separate groups (of a very small number), contact between them is reduced to a minimum. Meal and rest of employees is organized in groups in specially designated areas. The work of all educational institutions, entertainment facilities, markets and bazaars is being stopped.

The local infectious disease centres all workers and employees of enterprises and institutions should take the following measures for personal safety: wear protective masks; comply with the basic rules of personal hygiene at work and at home; not to use unproven or contaminated food and water; no smoking in the contaminated area; in case of appearance of sickness or weaknessthey should immediately contact a doctor.

The population strictly follows the guidelines for the implementation of HIS (Health Inspection Service) recommendations of all sanitary and epidemic measures.

Quarantine in the centre of infectious diseases after disinfectionof the external centre is replaced by the observation..

Observations are regime and restrictive measures that provide, along with the increased medical and veterinary supervision and conduct of preventive, curative, prophylactic, veterinary and sanitary measures, a restriction of movement of people or livestock in all the surrounding zones to the quarantine administrative-territorial formations that create the observation zone of the spread of infectious diseases.

The objective is to prevent the spread of infectious diseases. For this purpose in fact, the same preventive measures as in the quarantine are taken, but the conditions of observation of the insulating-restrictive measures are less stringent.

The establishment of regime and behavioral rules in the centre of the infectious diseases, as well as the medical services requirements should be abid by all the citizens unconditionally. Nobody has the right to evade preventive vaccination and acceptance of drugs.

It is only allowed to take water from the water supply or with uninfected inspected the medical service of water sources in the centre of the infectious diseases. All products should be stored in tightly closed containers and handled before use: to boil water and milk, raw fruits and vegetables should be thoroughly washed and boiled, individual dishes should be used for eating.

It is necessary to carry out disinfection, decontamination of the items indoors. Decontamination is made in simpler ways: by washing with soap and water, boiling the individual items, etc.

For disinfection of premises the lit (settled) 0.1-0.5 percent chlorinated lime solution is often used. To produce 5-percent solution 10 liters of water are required to be diluted with 0.5 kg of chlorinated lime solution and let it settle.

The procedure of disinfection, disinfectants and solutions.

Sanitization is called a removal of radioactive substances, disposal or removal of toxic substances, pathogens and toxins from the skin of people and personal protective equipment, clothing and shoes that were on. It may be complete or partial.

Partial sanitization during the infection with radioactive substances is held if possible during the first hour after getting infected, after the spread of the radioactive substances directly into the zone of radioactive contamination and is repeated after leaving it.

When infecting with drip-liquid toxic substances and their sprays sanitizing is made immediately.

With the simultaneous infection with radioactive, toxic substances and bacterial agents toxic substances are primarily neutralized, and then the actions provided for handling radioactive substances during infection and bacterial agents are carried out.

Members of civil defense forces and the population use individual anti-gas packages (IPP-8 and its analogues) for carrying out partial sanitization, as well as various means available. Terms of use of IPP-8 package are provided in the form of instructions to it.

Complete sanitization consists of washing the body with warm water and soap. During radioactive contamination full sanitization is carried out in case if after partial sanitization infection of skin and clothes the remains are higher than the acceptable norm. Complete sanitizing should be done if possible within 3-5 hours after infection: carrying it out it after 10-12 hours is practically ineffective. Clothing is replaced if after handling, the contamination level remains above the acceptable norm. Complete sanitization during infection with drip liquids and their aerosols and can be conducted after the partial handling for the hygienic purposes.

When infecting, all the people that are in the area of bacterial agents action are to face sanitization despite the use of protection means and partial sanitization conduct. Infected clothing is subject to disinfection or replacement.

For the complete sanitization sanitary items based on stationary washing baths, showers and changing rooms pavilions; sanitization kits KSO; infectious showers settings DDA-53A, DDA-66, DDP are used.

Point of special treatment PST are designated for complete sanitization of personnel and the population, complete deactivation, decontamination and disinfection of weapons, equipment, decontamination and disinfection of the uniform, clothes, footwear and protective equipment. These points are located at uncontaminated areas around or directly in the centre of civil defense forces, which are subject to special treatment.

Disinfection of the area is carried out by chemical and mechanical means. Degassing of the areas should be made through the impact on toxic substances by the stream of hot gas from jet engines of the heat machines.

Disinfection is performed chemically by spreading solutions (suspension) for degassing or spillage of dry matter for decontamination over the territory.

Mechanical method of disinfection lies in the remote disinfection of contaminated soil or snow layers. Cutting the upper layer of soil is carried to a depth of 3-4 cm, layer of loose snow - up to 20 cm, thick snow - up to 6 cm.

Disinfection of clothing, footwear and personal protective items is performed by vapor or paraformaldehyde mixture, boiling, soaking in solutions for disinfection (or wiping them), washing up.

Vapor mixture is used to disinfect all types of clothing and personal protective equipment, except for skin coat, fur, leather and felting products, which are to be disinfected with vapor mixture in accordance with the instructions to the disinfection showers cars (DSC) and disinfection showers trailers (DCT).

Disinfection of clothing and personal protective equipment, infected by thevegetative forms of microbes, is carried out by soaking in the 5% aqueous solution of phenol, lysol or naphtalysolum (with variola virus infection the concentration increases to 8%), 3% monochloramine solution or 2.5 % solution of formaldehyde for 1 hour. When infecting with spore forms of bacteria the soaking in 10% solution of formaldehyde for 2 hours is carried out.

Disinfection of clothing and personal protective equipment by washing is carried out with a special technology.

Disinfectants. For disinfection technology, solutions of formaldehyde, phenol and its derivatives (cresol, lysol and naphtalysolum) are used; suspensiums and slurry of two-thirds of the salt calcium hypochlorite and chlorinated lime; aqueous solutions of powder SF-2U.

Aqueous solutions of detergents in relation to the pathogens have a weak effect and is used only to lower sowing germs surfaces and neutralize toxins.

For disinfection of equipment, infected by the vegetative forms of bacteria, 3.5% solution of formaldehyde, 1% a suspension of two-thirds of the salt calcium hypochlorite, 2% monochloramine solution is used.

For disinfection that is contaminated with spore forms of bacteria, the most effective is 17-20% water solution of formaldehyde (formalin), which contains 10% by weight of monochloramine B.

Formaldehyde is a colorless asphyxiating gas that dissolves in water. There is 35-40% aqueous solution of formaldehyde, called formalin. It is stored and transported in iron barrels or in special bottles which are inserted in a wicker basket.

Phenol is a solid pink-brown substance, which dissolves in water well. Dipped in pink liquid carbolic acid consisting of 90% phenol and 10% water is often used in practice.

Mehtyl phenol (cresol) is dark-brown oily liquid, slightly soluble in water, easily soluble in acids and alkalis; used in the form of 3-5% -s krezolovyh hot soap solution.

Lyzol is cresols in liquid solution (potash) and is a red-brown oily liquid that dissolves well in water; disinfection of the weapons and equipment used in the form of 3-5% water solutions.

Naphtasolum is a mixture of 65% naphthenic soap and 35% of cresol, which has effect in disinfection and washing, in the form of 5-10% water solutions is used for the same purposes as lysol.

Table 3.1.

Task:
Groups of infectious diseases

Groups of diseases	Examples of diseases	Localization	Ways of pathogen transmission
Infections of the respiratory ays			
Intestinal infections			
Blood infections			
Infections of the external covers			

Description of an infection:

Conclusions:

Topic Psychological peculiarities of a human

Laboratory class 4. Defining the main psychological peculiarities of a human and their influence on safety

Objective. Show the influence of physiological peculiarities of the human impact on the safety. To familiarize students with psychodiagnostic method for assessing psychological characteristics of a person by testing.

Task: To assess individual elements of human psychophysiological reliability using the following tests:

Part 1.

1. Test for defining analyticity thinking;
2. Test for researching the selectivity (test -a) and concentration (test -b);
3. Test for defining the temperament of the individual, graphically show the type of nervous activity;

Part 2.

4. Test for defining volitional qualities of a person;
5. Test for establishment of the sociability level;
6. Test for defining the level of self-esteem;
7. Test for defining the stress resistance.

After the appropriate tests being carried out students analyze the results obtained in terms of personal safety and prepare a report form.

General provisions

Higher cognitive functions is a complex of mental processes that are nbeing formed throughout life. They are social in their origin related to the programming of human life by setting goals and objectives. As a result of this, mental orientation becomes random, special types of attention, thinking, memory, perception appear: arbitrary attention, random memory, observation.

The feature of higher mental functions is that initially they act as a form of interaction between people and only later as both internal, i.e. intrapsychological process. Therefore, thinking, language and imagination towards the implementation of higher cognitive functions, largely determine the consciousness of the individual.

Thinking arises and develops along with practical activities based on direct human sensory perception. Owing to thinking, the essential properties and relationships of objects and phenomena of reality in a generalized form and indirectly are depicted. The basis of thinking is formed by the analysis and synthesis operations, however, each act of thinking is a unity of knowledge, action and thinking of the human towards the relation to ones activities. While studying the theme "Thinking" students are invited to get acquainted with the term "mindset" and impact of the " mindset " on a way of solving tasks.

Attention is revealed in the direction and focus of human mental activity. Important characteristics include selectivity, stability, concentration, distribution and switching.

Modified technique can detect a sufficient number of characteristics of thinking: its speed, depending on the mindset, flexibility, or conversely, stiffness. There are methods of diagnosis selectivity and concentration.

Test 1. Research analyticity thinking

Materials and equipment: the form with 15 rows of numbers, compiled from a pattern, pen and stopwatch.

The form of printed thereon table series of numbers is as follows:

№	The numeric rows
1	2 4 6 8 10 12 14 ....
2	6 9 12 15 18 21 24 ... .
3	3 6 12 24 48 96 192 ....
4	4 5 8 9 12 13 16 ....
5	22 19 17 14 12 9 7 ....
6	39 38 36 33 29 24 18 ...
7	16 8 4 2 1 ½ ¼ ....
8	1 4 9 16 25 36 49 .....
9	21 18 16 15 12 10 9 ....
10	3 6 8 16 18 36 38 ....
11	12 7 10 5 8 3 6 ...
12	2 6 9 27 30 90 93 ...
13	8 16 9 18 11 22 15 ....
14	7 21 18 6 18 15 5 ....
15	10 6 9 18 14 17 34 .....

Instruction to the researched one: “Rows of numbers are printed on the forms that lie in front of you. Try setting at which pattern is composed each of 15 proposed numerical series. According to this pattern continue every row, expanding it in two numbers. 7 minutes are given for the task.

In 7 minutes the command is: Stop! Writing is finished!”

Analysis of the results. The level of analyticity thinking is defined by the number of rows of numbers written correctly.

If the researched completed 14 - 15 rows of numbers, his or her analyticity thinking is very high or excellent; if 11 - 13 – analyticity is high or good; if 8 - 10 - average or satisfactory; if 6 - 7 - low or bad; if 5 or less, the analyticity is very low or bad.

Test (a). Research of attention selectivity

Materials and equipment: Test form, pencil and stopwatch.

Procedure of the research. The research is carried out in pairs consisting of experimenter and the researched. The experimenter reads the instruction to the researched, provides a test form and records the time of performance.

The test form is the following:

The Researched_____

The Experimenter_____

Test form

SDGRHSUNKYFTOYJHFNMPOUNBVCFBUILDINGIUTREWETUOLKGDFFF
GHLKJHGFDWINDOWlKGJDGSXGIRLPOIUYFGHJKAPPLEHDKSCNVBNAR
MCHAIRCVBNMBOOKPOIUYTRPENCILFGHJKLWERTYUIOWATERSDFGH
JKLTOUCHASDFGHJKLBEDROOMZXCVBNMPHONELKJHGFDSAZXCVFO
RESTMNBVCXTREESDFGHJKBALLWSDXCVGTRSNAKELKJHFGZXCVBN
MCATIJHGVBNMONUMENTOKJHBNVMORNINGPLKMNBVFGLKJGLIGHT
OIUYTRDOORSDFGHJAPARTMENTLKJNBFHDRWALLERTNERTYGFDSHJ
NVCXMOVIEKJHHGFDSXVCBNFRYUEOWLKFHGJDSXM

Instructions to the researched: "You will be provided a test form with a printed letters and words on it in a row. Search and underline the words there. Try not to miss a single word and work quickly, as the time is fixed. If everything is clear and there are no questions then start!"

Processing and analysis of the results. Indicators of attention selectivity in this experiment is the performance of the task and the number of the underline words found. All in all there are 25 words in this test:

The result is assessed using the scale of assessments, which comprises points depending on the time spent searching for words. For every word left out, one point is deducted.

Time, s	Points	Level of attention selectivity
250 and more	0	I low
240 – 249	1	I low
230 – 239	2	I low
220 – 229	3	I low
210 – 119	4	I low
20 – 2090	5	I low
190 – 199	6	I low
180 – 189	7	II medium
170 – 179	8	II medium
160 – 169	9	II medium
150 – 159	10	II medium
140 – 149	11	II medium
130 – 139	12	II medium
120 – 129	13	III high

110 – 119	14	III high
100 – 109	15	III high
89 – 99	16	III high
78 – 88	17	III high
70 – 79	18	III high
60 – 69	19	III high
less than 60	20	very high

Test (б). Research concentration of attention

Materials and equipment: Test form, pencil and stopwatch.

Procedure of the research. The experiment can be conducted with one researched, as well as with a group of 5 - 9 people. The main terms of working with the group - conveniently place the participants, provide each with the test forms, pencils and observe silence during testing.

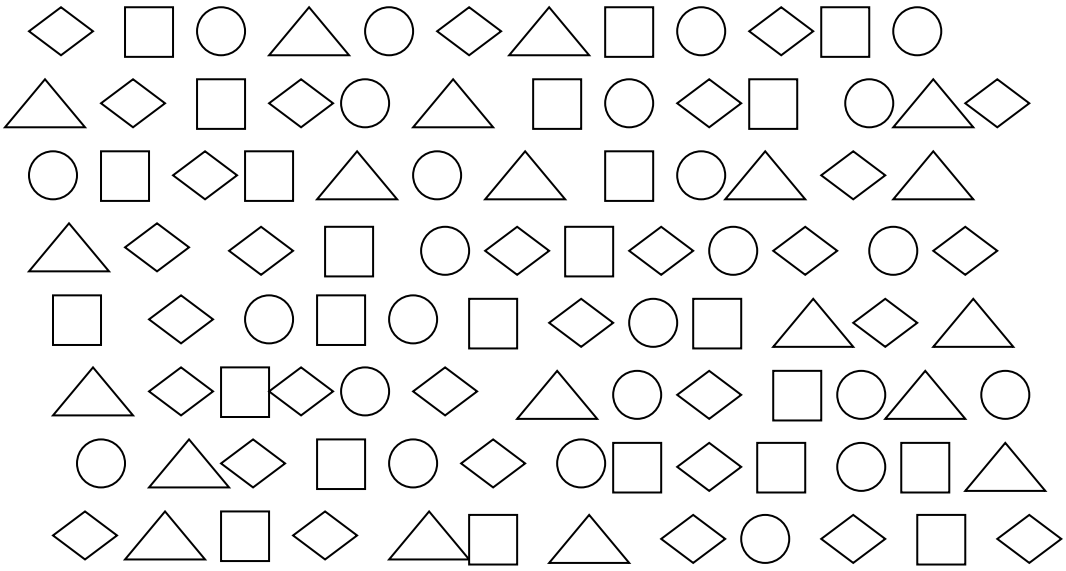
Instructions to the researched: "You are suggested a test with the images on it four geometric figures: square, triangle, circle and rhombus. With a signal "Start!" arrange as soon as possible and without error in these figures the following symbols: the square – plus, the triangle – minus, the circle – nothing in the rhombus – full stop. Arranged these signs consecutively in series in each figure in line from left to right. Time on the job – 1 min.

Processing and analysis of the results. The results of this testing is the number of filled in geometric shapes including circles and number of errors within 1 min. The level of concentration is defined according to the table 5.1.

5.1. The level attention spans

The number of processed figures	Rank	The level of concentration of attention s
100	1	Very high
91 - 99	2	High
80 - 90	3	Average
65 - 79	4	Low
64 and less	5	Very low

The form with geometric figures is as follows:



The rank is reduced according to the mistakes made while filling. If there has been 1 - 2 errors, rank reduces by one, if 3 - 4 by two ranks, and if there are over 4 errors, the concentration of attention is considered worse by three ranks.

Analyzing the results, it is necessary to find out the reasons that have led to such results.

Part 2

General provisions

Higher nervous activity (HNA) is a body activity aimed at interaction with the environment. HNA basis is composed of conditioned reflex (Table 5.2).

Numerous studies of people's activity from different walks of life had revealed the influence of the results of work, especially on behavior, in extreme situations of many physiological peculiarities, namely the qualities of temperament, and weak nervous system; abilities; sensorimotor reactions; competence; communication skills; determination and discipline, self-control; self-assessment.

5.2. Characteristic of reflexes

Unconditioned reflex	*Conditioned reflex*
The hereditary form of the activity	Acquired after birth
Has a fixed reflex arc	Formed on the basis of a temporary connection between unconditional and conditional centers
Participation of NS structures is not required	Mandatory participation CNS (cortex)
The presence of specific receptive field and specific stimulus	No specific receptive field and specific stimulus
Differentiated by strength and constancy	Characterized by fragility may vary fade

Methodologies suggested in the recommendations, allow to define the type of nervous activity, volitional qualities of a person, the level of communication skills, self-esteem and stress resistance.

There are 4 types of higher nervous activity (table 5.3).

4.3. Types of Higher Nervous Activity

According to Hippocrates	*According to Pavlov*
Sanguine	Strong, balanced, agile
Phlegmatic person	Strong, balanced, inert
Choleric	Strong, imbalanced, with a predominance of excitation
Melancholic person	Weak processes of excitation and inhibition

4. Type of higher nervous activity

There are 12 statements. Please read them and decide whether they belong to you personally. If you are, then put a mark "yes", do not think long. The best answer is the one that first came to mind.

1. Generally carry out my activities without prior planning.
2. It happens that I feel either happy or miserable with no apparent reason.
3. I feel happy when doing business, which requires immediate action.
4. Prone to mood swings from bad to good with no apparent reason.
5. While making new acuqintances, take the initiative first.
6.I am often in a bad mood.
7. I am tend to act quickly and decisively.
8. It happens that I try to focus on something, and I can not.
9. You are fiery temper person.
10. It often happens that during a conversation with another person you are present only physically, but thoughts are somewhere else.
11. I feel uncomfortable when I do not have to a chance to communicate.
12. From time to time I am full of energy, and from time to time I am a very passive.

Data processing. Make an axis on the Cartesian coordinate system, write the amount of "yes" of all odd statements horizontally (from the left to the right), and to the topthe amount of "yes" of all paired statements - vertically (from the bottom to the top). Define the coordinate of your results, and behind them - the type of higher nervous activity: sector 1 - choleric; sector 2 - sanguine; sector 3 - phlegmatic; sector 4 - melancholic.

If the coordinates are located near the crossroads, it means that you have a mixed type of higher nervous activity.

Remember that the brightly defined types occur less frequently.

Test for defining volitional qualities of a person

Will is a person’s ability to control one’s actions and deeds. It is expressed through high self-control in dangerous situations, ability to overcome obstacles that have arisen on the path to the goal achieving, the ability to subordinate one’s desires to the duty requirements, the ability to overcome feelings of insecurity, doubt and fear.

Activity of a modern worker, which is characterized by the frequent occurrence of dangerous accidents, also has high requirements towards one’s volitional qualities.

Are you a strong-willed person?

Give a frank answer. If you can confidently answer "yes", put on paper 2 points if "no", put zero, but if you find it difficult to answer precisely, there are doubts, place 1 point.

1. I complete uninteresting work to the end, even if I lack time.

2. If it is necessary to do something unpleasant I force myself, overcome internal resistance.

3. In a conflict situation I am able to focus and objectively assess one's own and other people's words and actions.

4. If I want to eat something sweet, I can afford to refuse.

5. I find the strength to get up in the morning, even if it is not planned, even if it is unnecessary.

6. I stay at the place of the street accident to witness.

7. I immediately reply to the letters.

8. I can overcome the fear of visiting the dentist office.

9. I calmly drink nasty medicine.

10. I carry out the promise given at theheat of the moment, even if it is related to a rather troublesome business.

11. I will without hesitation go to an unfamiliar city, go on a tourist trip, tour.

12. I precisely perform daily routine .

13. I condemn debtors (in all types of activities).

14. Even the most interesting film will not force me to postpone the work I have to do.

15. I can stop the dispute, despite the insulting words of the opponent.

Total points will determine how strong-willed person you are. If you earned 12 points - you lack willpower, attitude toward duties is careless, as if you do only what is interesting and easy to perform. Those, who earned 13-21 score, have a very strong will, but not always acting purposefully and when the workaround occurs, the person will not pass it. However, the given words this person will comply and unpleasant work, usually, sets to perform. However, they will not cause any difficulties on their own.

Finally, 22-30points. Without a doubt we can say: you are a strong-willed person. You can be relied on, and will not let down. Cases, challenges, unexpectable situations do not scare you off. But if there are over 30 points certain deficiencies may be noted. Sometimes you are irreconcilable, your self-averse in unimportant matters hinders communication with others - you are too categorical in the judgments.

Test for establishment of the sociability level

In each of these 16 questions, answer "yes", "sometimes" or "no".

1. You are looking forward to the usual business meeting. Is it brings you out of balance?

2. Do you postpone a meeting with a doctor to the time when it becomes necessary?

3. Does the order to deliver a speech, report, information at the meeting cause you confusion and discontent?

4. You are offered to go on a business trip to the city, where you have never been. Would you put a lot of effort to prevent this business trip?

5. Do you share worries with someone?

6. Are you annoyed when a stranger on the street appeals to you with a request (showing the way, saying the time)?

7. Do you believe that there is a problem of "fathers and sons" and that people of different generations are difficult in understanding each other?

8. Would you feel ashamed to remind a friend that he forgot to pay you back the debt, which he lent several months ago?

9. In the restaurant or dining room you were given meal of a poor quality. Will you keep silent, by just pulling away the plate?

10. Being alone with a stranger, will you keep silent? And will you be angry if a stranger speaks first?

11. Do you fall into despair when you see a long line? Will you refuse from your intentions to become the "tail" of the queue?

12. Do you fear to participate in any committee to review conflict situations?

13. Do you own, highly individual evaluation criteria of the works of literature, art, or any "other" thoughts are on not taken into account?

14. Having hear "on the sidelines" false claims on the question well known to you, will you keep silent, without getting engaged in the debate?

15. Does the request to help someone to understand the question or the official training topic causes any dissatisfaction?

16. Do you prefer writing over oral answers?

Estimates answers: "Yes" - 2 points, "Sometimes" - 1 point, "No" - 0

Results:

30 - 32 points - you are obviously not communicative, and this is your problem, this is you, first of all, who suffers from this. But for close people around you, this is not easy as well! Try to become more companionable, control yourself.

25 - 29 points - you are closed, taciturn, prefer solitude, so you probably have few friends. New work and the need for new contacts, if not leading you to panic, will ruin your balance for a long period of time. You know this feature of your character and may be dissatisfied with themselves. But your are not only restrained by dissatisfaction - you are able in certain circumstances to change you character.

19 - 24 points – you are, to some extent, companionable: in an unfamiliar environment you feel pretty confident. New problems do not scare you. Yet you come together the new people hesitantly, and you get involved in arguments and debates with pleasure. Your statements sometimes are unreasonably sarcastic.

14 - 18 points - you have normal communicability. You are curious. You willingly listening to interesting interlocutor, patient, defend your point of view calmly. Without worries you go to meet new people. At the same time, you do not enjoy noisy companies; extravagant behavior, verbiage causes irritation.

Determination of test stress

Answering the questions of the test, specify how often you are in the listed states the following scale: often - 3 points, sometimes - 2 points, rarely - 1 point. Remember, the schyrishi will your answers, the result will be more objective.

The fewer points you score, the higher your stress. If you have the first or second level of stress, you need to dramatically change your lifestyle.

№	Questions	Answer		
		rarely	sometimes	often
1	I think the team underestimated me	1	2	3
2	I try to work despite health	1	2	3
3	I'm a fan of the quality of their work	1	2	3
4	I am aggressive (Noah)	1	2	3
5	I can not stand criticism	1	2	3
6	I am angry (Noah)	1	2	3
7	I try to be a leader, where possible	1	2	3
8	I believe persistent and assertive man	1	2	3
9	I was worried about insomnia	1	2	3
10	His enemies I fight back	1	2	3
11	I am emotionally hurt and worry trouble	1	2	3
12	I have no time to rest	1	2	3
13	I am having conflicts	1	2	3
14	I have enough power to realize itself	1	2	3
15	I have no time to engage in favorite business	1	2	3
16	I do everything fast	1	2	3
17	I feel fear not offered the session and will be excluded (Noah) from the Institute	1	2	3
18	I act rashly and then worry about their affairs and actions	1	2	3

Calculate the amount of points and determine the stress level on a scale:

The level of stress		Total points
Quantitative Assessment	Qualitative assessment	
1	very low	54
2	low	50-53
3	Below average	46-49
4	Slightly below average	42-45
5	Average	38-41
6	Slightly above average	34-37
7	Above average	30-33
8	High	26-29
9	very high	22-25

Conclusions: _____

_____

_____

_____

_____

Topic. Technogenic hazards and their consequences.

Laboratory class No. 5. **Noise of air pollution in cities and its social hazard coefficient**

Goal. Rate noise level of air pollution in cities and its social hazard ratio

Terms

Sound - a combination of sounds of different frequencies and intensities that arise from the vibrational motion of particles in elastic media (solid, liquid, gaseous). Minimum sound intensity, which treats ear, called the threshold of audibility. It depends on the frequency of sound waves. For comparison made by standard frequency of 1000 Hz. Sound waves have a frequency threshold of audibility of sound intensity at 2.10 W / m2 and sound pressure 2 * 10-5 Pa. Pain in the ear occur when sound intensity 100 W / m2 and the sound pressure of 200 Pa. Because these values vary widely, for hygienic assessment of noise used are not absolute values, and decimal logarithms ratio of these values to the zero level of standard that meets the threshold of audibility. Logarithm of these relations is called intensity level and sound pressure, measured in belah (B). But in practice, using ten times smaller unit from Bella, namely decibels (dB), because the human ear is able to distinguish the sound intensity level about 0.1 dB.

5.1. Characteristics zones and noise pollution levels in cities

№	Characteristics of the zone of noise pollution	Noise level, dB
1	Noise pollution missing	35 and less
2	Very poor noise pollution	40
3	Weak noise pollution	45
4	Slight noise pollution	50
5	Small noise pollution	55
6	Moderate noise pollution	60
7	Big noise pollution	65
8	Considerable noise pollution	70
9	Strong noise pollution	75
10	Dangerous noise pollution	80
11	Very dangerous noise pollution	85
12	Especially dangerous noise pollution	90 and more

The total sound intensity level L, which creates multiple noise sources with the same level L1, calculated by the formula

$$Lc = L_1 + 10Ig\ N,$$

де N – sources of.

One of the main sources of noise in cities is road transport. The noise of traffic depends on the transport, traffic, condition covering the streets. The levels of noise pollution in urban areas of the main sources of noise may be filed in the twelve system (Table 6.2).

The magnitude of the noise that is generated transport stream, depending on speed, traffic and vehicle types. The level of noise that make cars, they are divided into three groups:

• cars;

• Cargo carburetor;

• transport diesel.

The expected noise level determined by the formula

$$L = 44{,}4+0{,}268V +10Ig\left(\frac{N_1+4N_2++8\,N_3}{V}\right) + \sum_{i=1}^{n} P_i ,$$

де V - speed of the car, km / h;

N_1 – the traffic cars, h^{-1};

N_2 - the traffic truck gasoline cars, h^{-1};

N_3 - the traffic commercial diesel, h^{-1}.

$\sum_{i=1}^{n} P_i$ – the amount of amendments that takes into account the location. territories predicting noise (in the first approximation these. negligible as amended)..

For noise ratio find social dangers of noise pollution site

$$T_i= 0{,}04\,(L_i - 55)\,H_i$$

де L_i – Noise in the territory, which exceeds the maximum permissible level of 55 dB;

H_i - the number of people exposed to noise.

Integral Social Security figure noise pollution determined by the formula

$$T = \sum_{i=1}^{m} Ti.$$

Noise adversely affects the human body as a whole and especially the central nervous system, causing a decrease in attention, slowing and speeding up the body's response fatigue.

To reduce the harmful effects of noise on workers depending on the type of set it permissible levels in the workplace. Equivalent noise level considering acceptable levels for all frequencies shall not exceed:

• 50 dB - in rooms design offices, laboratories

• 60 dB - in areas to manage and working rooms;

• 80 dB - in production facilities for permanent jobs, experimental laboratories.

Reducing noise levels indoors achieved through:

• noise reduction at the source of its formation; isolation of noise sources;

• architectural and design solutions;

• use of personal protective equipment.

Objectives:

1.Vyznachyty noise traffic consisting of cars, trucks gasoline and diesel vehicles;

2. Assess factor of social hazards of noise pollution. Take notation: velocity - V; traffic - N, the share of cars - K_1; truck gasoline - diesel trucks and K_2 - K_3, the number of people living in the area - H_i..

ariants individual tasks

№	Speed of the car V, km/h	Інтенсив-ність руху N, per hour	Частка автомобілів			The number of people living in the area of noise, H_i
			passenger, K_1	freight carburetor, K_2	freight diesel, K_3	
1	2	3	4	5	6	7
1	30	800	0,65	0,25	0,10	1000
2	35	800	0,60	0,20	0,20	1100
3	40	800	0,70	0,20	0,10	1200
4	45	800	0,80	0,15	0,10	0300
5	50	800	0,90	0,10	0,10	1400
6	55	800	0,70	0,05	0,05	1500
7	60	800	0,90	0,10	0,20	1600
8	55	1000	0,85	0,05	0,05	1700
9	50	1000	0,80	0,10	0,05	1800
10	45	1000	0,75	0,15	0,05	1900
11	40	1000	0,70	0,15	0,15	2000
12	35	1000	0,65	0,15	0,20	2100
13	30	1000	0,60	0,20	0,10	2200
14	35	400	0,70	0,20	0,10	2300
15	40	400	0,60	0,25	0,05	2400
16	45	400	0,85	0,20	0,10	2500
17	50	400	0,75	0,10	0,05	2400
18	55	400	0,65	0,05	0,05	2300
19	60	400	0,85	0,15	0,05	2200
20	55	1500	0,90	0,15	0,10	2100
21	50	1500	0,85	0,20	0,15	2000
22	75	1500	0,80	0,20	0,20	1900
23	40	1500	0,75	0,10	0,10	1800
24	35	1500	0,70	0,05	0,15	1700
25	30	1500	0,65	0,05	0,10	1600
26	35	600	0,70	0,15	0,10	1500
27	40	600	0,75	0,15	0,10	1400
28	45	600	0,80	0,15	0,10	1300
29	50	600	0,85	0,10	0,05	1200
30	55	600	0,90	0,05	0,05	1100

Conclusions: _____

QUESTIONS:

1. What is an industrial environment?
2. What are the main elements of the industrial environment.
3. Describe the meteorological factors.
4. What factors characterizing microclimate of home?
5. What is the role of microclimate regulation?
6. What are allergens? How will they influence on the climate?
7. What are the main recommendations to reduce exposure to allergens in the domestic environment.
8. Describe the lighting requirements for the workplace.
9. What is the noise?
10. Give characteristics of areas and levels of noise pollution in cities.
11. What are the main characteristics of the work with the PC?
12. What preventive measures when working with computers.
13. According to the Rules of fire safety in Ukraine which are major organizational measures to ensure fire safety?
14. What are the main activities of the persons responsible for fire safety?
15. What is fire protection system?
16. What is the fire safety facility?
17. What are the main sources of ignition protection?
18. What is the chemical safety?
19. Which countermeasures include restricting agricultural activities, temporary relocation of the population, limited use of radioactively contaminated water and food?

Topic. Chemical security.

Practical class No. 6. The environmental risk assessment. Identify the environmental risk assessment of pesticides in different climatic zones of Ukraine.

Purpose. Familiar with integral indicator that characterizes the potential contamination of agricultural landscape, learn to identify the risk of pesticides used in growing crops.

Objectives:

1. Determine the risk of pesticides used in growing crops using ahroekotoksykolohichnoho index (AETI). .

General questions

For an objective assessment of pesticides used in different climatic zones of Ukraine for growing crops used integrated classification. According to this classification pesticides are characterized by an integral factor, which takes into account the toxicological and hygiene (category A) and ecotoxicological aspects (category B).

Category A describes the dangers of pesticides at: chronic action; poisoning; skin irritation; irritation of the upper respiratory tract; allergic action and others. Chief among them is the LD50 - dose that causes 50% of deaths of animals when injected into the stomach.

Category B describes the dangers of pesticides ecotoxicological indicators: biokumulyatsiya in the migration of pesticides in surface, water and soil ecosystems; migration in the soil profile; in the soil - plant - water – air; phytotoxic action; improving the nutritional value of products, the effect on soil biocenosis; toxicity to beneficial insects, fish; the formation of toxic degradation products; the maximum level (MRL), etc. The half-life (T_{50}), that period (in dobah), for which the amount of toxic substances in the test object is reduced by 50%, is the main criterion for category B.

Pesticides are considered practically safe if LD_{50} dose greater than 1000 mg/kg, and T_{50} - less than 3 days. In each category, provides for the distribution of drugs in four classes: I - dangerous; II - dangerous; III - moderately hazardous; IV - little dangerous. Integral classification can be represented by a scale of 7 degrees of danger, defined by the formula

$$C_H.= (K_A + K_B) –1,$$

де C_H - the degree of danger the drug; K_A і $K_Б$ – hazard classes of pesticides in categories A and B.

According to the formula, integral degree of risk expressed natural integer from 1 to 7 and pesticides describes thus: dangerous - the gravity of 1 and 2; dangerous - 3; moderately dangerous - 4 and 5; little dangerous - 6 and 7.

To assess the level of risk and prognosis contamination with pesticides was used a model that includes three parameters: the properties of drugs, quantitative load them into and intensity decay in specific soil and climatic conditions. An indication of the range of features pesticides used is the average degree of danger (Q), which is calculated by the formula:

$$Q = \sum_{i=n} C_{Hi} \frac{mi}{------},$$

.

$$i=1 \qquad M$$

C_{Hi} – the degree of danger integrated pesticide;
m - the amount of pesticide that will be used or applied, kg;
M - the total number of all pesticides, kg.

Averaged load pesticides on the farm ecotoxicological measured dose (D):

$$Д = \frac{MS_{об}}{S_{ор}} \text{ кг},$$

де: $S_{ор}$ – the total arable area, ha; $S_{об}$ – area, which is processed, ha.

Tolerance territory to pesticide load capacity index is estimated to land clean (Izon). This figure reflects the intensity of pesticide degradation depending on soil - climatic conditions and varies from 0.1 to 1.

Potential pollution (V) assess agricultural landscape integral indicator that considers three options:

$$\mathbf{V = \frac{Д}{QI_{зон}}}, \text{ умовних кг/га}$$

The risk of pesticides used in growing crops, was described by ahroekotoksykolohichnym index – AETI

$$\mathbf{AETI = \frac{10\ V\ (1+V)^3}{(1+V)^4 + 5000}}$$

AETI characterized by values from 0 to 10: a little dangerous - 0-1; medium dangerous - 1-4; increased danger - 4-8; highly dangerous - 8-10.

When planning measures to protect chemical plants grown in the economy should pick up the range of pesticides and their total consumption per unit of arable area so that the value AETI were as little as possible and would not exceed the value of 1. If more than one AETI, control of the actual content pesticides in food crops and agro-ecosystems sites is a must.

Variants individual tasks

№	Pesticides that used	Index purification, $I_{зон}$	Total arable area, ha ($S_{ор}$)	Area, which is processed, ha ($S_{оБ}$)
1	2	3	4	5
1	1,3,5,12,13	0,3	0,6	0,1
2	1,2, 6,8,12,13	0,5	0,4	0,08
3	1,5,7	0,8	0,5	0,1
4	3,4	0,55	0,1	0,09
5	7,12,13	0,2	0,1	0,06
6	4,4	0,5	0,4	0,045
7	4,12	0,8	0,15	0,04
8	1,4,8,12,13	0,55	0,3	0,07
9	2, 6,8,12,13	0,2	0,4	0,08

10	3,5,12,13	0,8	0,5	0,1
11	2, 12,13	0,55	0,1	0,4
12	1,12,13	0,2	0,1	0,15
13	4,8,11,13	0,5	0,4	0,3
14	2,9,12,13	0,8	0,1	0,4
15	6,8,11,13	0,8	0,4	0,5
16	6,8,12,13	0,3	0,15	0,1
17	9,12,13	0,55	0,3	0,4
18	7,10,12	0,4	0,4	0,15

Conclusions: _____

QUESTIONS:

1. What is an industrial environment?
2. What are the main elements of the industrial environment.
3. Describe the meteorological factors.
4. What factors characterizing microclimate of home?
5. What is the role of microclimate regulation?
6. What are allergens? How will they influence on the climate?
7. What are the main recommendations to reduce exposure to allergens in the domestic environment.
8. Describe the lighting requirements for the workplace.
9. What is the noise?
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11. What are the main characteristics of the work with the PC?
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13. According to the Rules of fire safety in Ukraine which are major organizational measures to ensure fire safety?
14. What are the main activities of the persons responsible for fire safety?
15. What is fire protection system?
16. What is the fire safety facility?
17. What are the main sources of ignition protection?
18. What is the chemical safety?

19. Which countermeasures include restricting agricultural activities, temporary relocation of the population, limited use of radioactively contaminated water and food?

20. Which organization regulates work with radioactive materials at the national level?

21. Which organization regulates operation with radioactive substances at the international level?

22. What type of radiobiological effects include the formation of cancer in the body tumors?

23. What type of radiobiological effects include radiation sickness?

Topic. Social environment of human residence.
Practical class 7. Determination of the individual types of behavior in conflict situations.

Purpose. 1.Zasvoyity main provisions of the "man in the environment. Man in a social environment "theoretical rate discipline" Safety ".

2. Acquire skills using self diagnostic psychological tests for self.

3. Identify possible predisposition to conflict behavior and its types, subject to a conflict.

Task. 1.Oznayomytysya with the general concept of "conflict", "types of conflicts", "ways of solving conflicts", "types of behavior in conflict situations on the model of Thomas."

2. Familiar with the principle of psychodiagnostic testing.

3. conduct testing to determine whether you are a personality conflict and typical form individual behavior in conflict situations.

4. Prepare a report in the form of conclusions.

5. Obtain skills on the way to resolve conflicts.

Terms

The conflict – a clash of opposing interests, views, controversial, complications, fighting the warring parties and the different levels of the participants.

There are two forms of course conflicts:

• open - outright confrontation, collision, struggle;

• latent or closed when no outright opposition, but does not stop the invisible struggle.

The goal of conflict resolution is to achieve a conflict-free ideal state where people live and work in perfect harmony, which is almost impossible.

To determine the types of behavior in conflict situations using two-dimensional model of regulation conflicts K. Thomas determining dimensions which are:

- Cooperation, connected with the person's attention to the interests of other people involved to the conflict;
- Assertiveness, characterized by a focus on protecting their own interests.

There are 5 types of regulation conflicts:

1. Racing (competition) - to achieve satisfaction of their interests to the detriment of another.

2. Adaptations - sacrifice their own interests for the sake of the other.

3. Compromise - agreement of understanding with the enemy reached by mutual concessions.

4. Avoidance, which is characterized as a lack of willingness to cooperate, and tendency to achieve their own goals.

5. Co-situation when participants come to a common solution that fully meets the interests of both parties.

Test 1

Are you a personality conflict?

To find out, use a test by choosing one answer to each question.

1. The public transport pass argument in a raised voice. Your reaction?

a- not involved;

B. vyslovlyuyus briefly to defense side, which I consider right;

B- actively interfere, the "cause the fire itself."

2. Do you speak up at meetings criticized leadership?

nor;

B. only when I have important reasons for this;

B criticized for any pretext not only leadership, but also those who protect.

3. Often you argue with your friends?

a- only if it is inoffensive people;

B. only on fundamental issues;

B disputes - my element.

4. queues, unfortunately, consistently part of our lives. How would you react if someone will come from?

a- oburyuyus in the shower, but keep quiet: a more expensive;

B. make comments;

B pass forward and begin to watch the procedure.

5. Home for lunch filed nedosolene dish. Your reaction?

a- I will not raise a rebellion trifles;

B. silently take the salt;

B did not refrain from harsh comments and may deliberately give up food.

6. If the street, in transportation you stepped on the foot. Your reaction?

a- indignantly'll see the offender;

B. dryly make comments;

B vyslovlyus not on ceremony in expressions.

7. If someone from the family bought a thing that you did not like:

a- silent;

B. limit myself to a brief comment considerate;

B- arrange scandal.

8. No luck with the lottery. What do you think of this vidnesetes?

a- try to go indifferent, but in my heart I will give a word never participate in it;

b- not hide frustration (frustration), but vidnesus to what happened with humor, promising to take revenge;

B- long losing spoil the mood.

Now count points scored based on the fact that each "a" - 4 points, "b" - 2 "in" - 0 points.

If you typed:

From 22 to 32 points - you are tactful and loving, easy to avoid disputes and conflicts, emergencies at work and at home. The expression "Plato is my friend, but truth is more expensive!" Has never been your motto. Maybe because you sometimes called opportunists. Please be brave if circumstances require essentially say, despite the person.

From 11 to 21 points - you believe human conflict. But in fact you conflict only when there is no other choice and other measures expired. You strongly defend their opinion, though how it will affect your state official or friendly relations. It is not beyond the scope of correctness, not to prynyzhuyetes image. All this is to have respect.

Up to 10 points - disputes and conflicts - the air, without which you can not live. Love criticize others, but if you hear the remarks in his address, can "eat alive." Your criticism for criticism, and not for good cause. It is very difficult to have those next to you at work or at home. Your intemperance and coarseness repel people. Is it because you have no real friends? In short, try to overcome his grumpy character!

Test 2 (TEST Thomas)

Select those statements that are most typical of your behavior characteristics:

1. A. Sometimes I give the opportunity to others to take responsibility for the issue that caused the dispute.

B. I try to point out what we both agree than discussing something which we disagree.

2. A. I try to find a compromise solution.

B. I try to settle the case with the interests of others and my own.

3. A. I try hard to achieve his.

B. I sometimes sacrifice their own interests for the benefit of another person.

4. A. I try to find a compromise solution.

B. I try not to offend the feelings of another person.

5. A. Uladnuyuchy contradictory situation, I always try to find support in another.

B. I try to find the best way out while avoiding unnecessary stress.

6. A. I try to get out of the conflict situation with minimal losses for themselves.

B. I try to get her, whatever it was.

7. A. I try to postpone the issue of conflict resolution in order to eventually solve it completely.

B. I think it possible to give your partner something if it will lead to positive results in resolving the issue as a whole.

8. A. Normally, I try hard to achieve his.

B. First of all I try to define the essence of conflict issues and find out what what are all affected (affected) the interests of the parties that address these issues.

9. A. I think that does not always have to worry about any emerging differences.

B. I devotes every effort to achieve his.

10. A. I try hard to achieve his.

B. Usually, I want to find a compromise solution.

11. A. First of all, I try to define that from which all consist infringed (affected) the interests and questions.

B. I try to consider the interests of the other and mainly preserve our relationship.

12. A. I usually stick to the neutral position to avoid disputes arising.

B. I give another opportunity to have an opinion when it also comes to meet me.

13. A. I stick to the neutral position.

B. I strongly defend their own point of view, taking into account the opinions of partners.

14. A. I tell the other their views and asked about his views.

B. I try nav`yazaty other logic and prefer my views.

15. A. I try to take into account the opinion of the other and save our relationship.

B. I try to do everything necessary to avoid conflict.

16. A. I try not to offend the feelings of another.

B. I usually defend their position, considering it better.

17. A. Normally, I try hard to achieve his.

B. I try to do everything to avoid useless tensions.

18. A. If it makes the other happy, I will give him the opportunity to insist on his.

B. I give another opportunity to stay in his mind if he also comes to meet me.

19. A. First of all I'm trying to define something which consist of all interests and controversial issues.

B. I try to postpone the decision controversial issue to eventually solve it completely.

20. A. I try to immediately overcome all differences that have arisen.

B. I try to find a mutually beneficial solution to the question with minimal losses.

21. A. Through negotiations, I try to be attentive to the interests of another.

B. I always lean to a direct discussion of issues.

22. A. I try to find a position that is in the middle between my position and point of view of another person.

B. I am convinced of the correctness of their position and defend their interests.

23. A. I usually concerned to satisfy the desire of all of us.

B. Sometimes I give the opportunity to others to take responsibility for solving controversial issues.

24. A. If the other's position is considered very important to him, I will try to meet its interests.

B. I try to convince the other to reach a compromise.

25. A. I try to show a different logic and benefits of my views.

B. Through negotiations, I try to be attentive to the interests of the other, and above all take into account their interests.

26. A. Generally, I suggest a compromise. B. I almost always try to consider both their interests and the interests of the parties so.

27. A. As a rule, I avoid to take a position that might cause controversy.

B. If it makes the other happy, I'm happy it will support.

28. A. Normally, I try hard to achieve his.

B. Uladnuyuchy situation, I certainly try to find support in another.

29. A. I offer a compromise solution.

B. I believe that not always have to worry about any differences arising

30. A. I try not to hurt feelings of others.

B. I always take a position on controversial issues that we together with other interested person could succeed.

Mark your answers in the key to the test.

Number of points gained by each individual scale, gives an idea of the prudence of his tendencies to exercise appropriate behavior in conflict situations. The maximum number of points for each type of behavior – 12. By counting the amount you typed points, determine which type of behavior in the conflict situation prevails in your behavior.

Please conclusions tests number one (as far as you personality conflict) and number 2 (which behaviors specific to you subject to the conflict).

Key to the test

№	Competition	Cooperation	Compromise	Avoidance	Adaptations
1				A	B
2		B	A		
3	A				B
4			A		B
5		A		B	
6	B			A	
7			B	A	
8	A	B			
9	B			A	
10	A		B		
11		A			B
12			B	A	
13	B		A		
14	B	A			
15				B	A
16	B				A
17	A			B	
18			B		A
19		A		B	
20		A	B		
21		B			A
22	B		A		
23		A		B	
24			B		A
25	A				B
26		B	A		
27				A	B
28	A	B			

29			A	B	
30		B			A

Recommendations regarding conflict resolution

Constructive debate as deliberately organized clarify the opposing viewpoints, to help resolve conflicts in interpersonal relations. Technique of conduct can be used in business and personal spheres.

Constructive debate has three distinct and consecutive phases.

1. Introduction. Accomplices have to confirm consent to the dispute and report what she called.

2. Average. The very argument. This is the essence of the dispute, not around it. Locations to respond to the need expressed by misunderstanding, criticism. Put your opinion specifically and clearly.

3. Conclusion. A decision on the issue that caused the dispute. You either acknowledge his mistake, or prove the validity of your position. Naidoo another something good and positive.

Conclusions: _____

QUESTIONS:

1. Identify and classify dangerous factors.
2. What are subgroups of physical factors of danger?
3. What are the factors of chemical hazards?
4. Describe the biological factors of danger.
5. Provide the classification of physiological factors of danger.
6. What is the risk in the life safety?
7. What is concluded quantitative risk assessment?
8. What is the axiom of danger?
9. What are the types of risk?
10. Name the kinds of environmental risk.
11. What methods of risk used in medical and environmental research?
12. Provide a definition of anthropogenic risk.
13. What is social risk?
14. What is social risk calculation?
15. Name the signs of structuring social risk.
16. What is a subjective risk?
17. What are the types of compensation acceptability of risk?
18. What are the qualitative characteristics of risk?
19. What is the statistical evaluation of hazards?
20. What is Noise?
21. Give characterization zones and the level of noise pollution in the city.
22. What are the main characteristics of the work with the PC?
23. Name the preventive measures when working with PC.
24. According to the Rules of fire safety in Ukraine which are major organizational measures to ensure fire safety?
25. What are the main activities of the persons responsible for fire safety?

26. What is a fire protection system?
27. What fire safety the object?
28. What are the main sources of ignition protection?
29. What is a chemical safety?
30. Describe the concept of "conflict", "types of conflicts", "ways of resolving conflicts," "behaviors in conflict situations on the model of Thomas."
31. What forms of conflict do you know?
32. Name the types of conflict regulation.
33. What are the orders of rescue in case of emergency?
34. Describe the implementation of sanitary and anti-epidemic measures
35. How is the investigation of accidents outside work?

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