



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal state autonomous educational institution  
of higher education  
«Far Eastern Federal University»  
(FEFU)

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**SCHOOL OF BIOMEDICINE**

«AGREED»

Head of education program  
«General medicine»

  
\_\_\_\_\_  
(signature) Khotimchenko Yu.S.  
(Full name)  
«09» of July 2019

«APPROVED»

Director of the Department of Clinical  
Medicine

  
\_\_\_\_\_  
(signature) Geltser B.I.  
(Full name)  
«09» of July 2019



**WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)**

**«Commercialization of Scientific Research Results»**

Education program  
Specialty 31.05.01 «General medicine»  
**Form of study: full time**

year 6, semester B  
lectures 18 hours  
practical classes 36 hours  
laboratory works not provided  
total amount of in-classroom works 54 hours  
independent self-work 18 hours  
control works ()  
credit year 6, semester B  
exam not provided

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

Author: c.m.sc., docent Rasskazova V.N.

## RESUME

The discipline "Commercialization of Scientific Research" is purposed for students enrolled in the educational program 31.05.01 "General medicine", and included in the variable part of the curriculum. Discipline is implemented on 6<sup>th</sup> year, 11<sup>th</sup> semester.

Development of the working program of the discipline was made in accordance with the Federal state educational standard of higher education in the specialty 31.05.01 "General medicine", the curriculum of training in the specialty 31.05.01 "General medicine".

The total complexity of the discipline studying is 2credits, 72 hours. The curriculum provides 18 hours of lectures, 36 hours of practical classes and independent self-work of the student (18 hours.), credit is in the 11<sup>th</sup> semester.

**The purpose of the discipline studying** " Commercialization of Scientific Research " is the formation of systematic representation and professional competence in students in the field of commercialization of scientific and practical activities, competent presentation of their developments and developments of colleagues in the market.

### **Objectives of the discipline:**

- formation of knowledge for commercialization of scientific and practical developments
- formation of competencies for the competent presentation of their scientific and practical developments in the market.
- study of the legal framework for the organization and management of scientific research
- mastering the systems of scientific activity management
- familiarization with the methods and criteria for evaluating the effectiveness of scientific research
- mastering the evaluation and analysis of the innovation project effectiveness

- familiarization with the basics of patent research and patent licensing work.
- formation of skills in the study of scientific literature and official statistical reviews on the commercialization of scientific and practical developments.

As a result of the study of this discipline the following General professional and professional competences (elements of competences) are formed in students:

Competence and its code	Stages of competence formation	
the ability and willingness to analyze the results of his own activity to prevent professional errors (GPC-5)	Knows	Methods of analysis, finding the problem, designing the optimal sequence of actions to achieve the goal, methods of planning scientific activities, evaluation and control of it. Principles of independent decision-making in the field of management of research organization
	Able to	Use educational, scientific, popular science literature, internet for professional activities. Analyze the results of their own activities to prevent professional errors and critically evaluate modern theoretical concepts and trends in medicine. To implement the principles of personal responsibility for decisions made in the organization of scientific research.
	Masters	Methods of analysis of the outcomes of their own activities to prevent professional mistakes: possession of various managing functions: planning, organization, regulation, monitoring and controlling, having the ability to consciously choose the optimal strategy, etc
the readiness to analysis and public presentation of medical information based on evidence-based medicine (PC – 20)	Knows	The essence of the evidence based medicine; types of scientific sources of information; methods of evaluation of scientific sources of information; algorithm of monographic and review essay; features of the scientific text and its design requirements; ways of presenting numerical information
	Able to	To analyze and evaluate the information of scientific sources; to make a monographic and review essay on the topic of research; to analyze ways of presenting numerical data in terms of speed of perception, data volume, logic; to use text and graphic editors to present the results of the study; to create a presentation to the report on the results of the study.

	Masters	Skills of scientific text design; skills of determining the type of numerical data; skills of choosing the optimal way to represent numerical data using different types of tables and charts
the ability to participate in researches (PC – 21)	Knows	The essence of research activities in medicine and health care; stages of scientific medical research and their content; design options for scientific medical research; the nature of errors in the results of scientific medical research and the causes of their occurrence.
	Able to	Plan scientific medical research; anticipate errors in the results of scientific medical research and take measures to minimize them.
	Masters	Skills of sample formation using various methods; skills of using the simplest methods of randomization in the formation of comparison groups; skills of forming comparison groups by means of paired selection; skills of calculating and evaluating a set of indicators based on the results of the observational (cohort) study; skills of calculating and evaluating a set of indicators based on the results of the experimental study; skills of calculating and evaluating a set of indicators characterizing the validity of the diagnostic test.
the willingness to participate in implementation of new methods and techniques aimed at protection of public health. (PC – 22)	Knows	Norms of international law, the main provisions of the legal documents of the Russian Federation regulating research activities in medicine and health care, as well as work on the practical use and implementation of the results of scientific medical research; the nature and classification of costs associated with medical intervention; types of effectiveness of medical activities, their essence and content; features of clinical and economic research
	Able to	Evaluate medical interventions in terms of cost-benefit ratio
	Masters	Skills of clinical and economic analysis

**I. THE STRUCTURE AND CONTENT OF THE THEORETICAL  
PART OF THE COURSE (18 hours)**

**11<sup>th</sup> semester (18 hours)**

**MODULE 1. ORGANIZATION OF SCIENTIFIC ACTIVITIES IN  
THE UNIVERSITIES OF RUSSIA (4 hours)**

**Theme 1 (2 hours) Organization of scientific activities in the Russian higher school.**

Classification of scientific activities. Varieties of scientific work. Organization of scientific research. Legal and regulatory framework for the organization and management of scientific research.

**Theme 2 (2 hours) System of scientific organizations.**

Foreign scientific organizations. Features of the organization of scientific research in the USA, Europe, Japan. Science management system. Features of the organization and stimulation of scientific work. Features of the organization and management of the research team. Ethics of scientific work.

Criteria for the effectiveness of scientific research. Methods and criteria for evaluating the effectiveness of scientific research.

**MODULE 2. Organization of work with scientific and technical information at university. Patent and licensing activities. (4 hours)**

**Theme 3 (2 hours) Information support** of research and development carried out at university, educational process of scientific, pedagogical, scientific, technical, economic information. Organization and implementation of promotion of scientific and technical achievements of university through the organization of scientific forums, exhibitions, advertising of research and development results.

**Theme 4 (2 hours)** organization of scientific, research and technical information for state registration. Information resources of the SSRTI bodies. Federal, branch, regional information centers. Organization of presentation of scientific, research and technical information in FEFU. The role of the exhibition center of university in promoting scientific production. Basics of patent research and patent licensing work.

**MODULE 3. COMMERCIALIZATION Of SCIENTIFIC DEVELOPMENTS AND LEGAL SUPPORT (4 hours)**

**Theme 5 (2 hours).** Comparison of scientific and technological activity in leading countries. Definition of innovation process and commercialization process. Legal acts and guidelines in the field of innovation. The structure of the

accompanying technology transfer (offices of commercialization).

**Theme 6 (2 hours).** Financing innovation. Life cycle of development. Stages of the innovation process. Stages of commercialization of scientific developments: monitoring of results; technological audit of results; business plan of innovative project; normative and technical support of results; legal support of commercialization. Existing legal forms of IP commercialization. The role of small innovative enterprises: Four models of innovative business organization.

#### **MODULE 4. Innovation activity infrastructure of university (2 hours)**

**Theme 7 (2 hours).** The main elements of the national innovation system. Legal and regulatory frameworks for innovation in Russia. Objectives of the Far Eastern Federal University aimed at the development of the regional innovation system. Infrastructure of innovative activities of the university. The normative basis for formation of the innovative environment of the university. The role of ITC in the innovation process of the University. The role of the BIS in the innovation process of the university. The role of the business incubator in the innovation process of the university.

#### **MODULE 5. Features and prospects of development of student science at university (4 hours)**

**Theme 8 (2 hours).** System of organization and management of research work of students and young scientists. Features and prospects of the student science development. Motivating students for research and academic leaders for guidance of students.

**Theme 9 (2 hours).** Features of the development of student science in FEFU. Programs and competitions as an indicator of a systematic approach to the development of motivation in FEFU. Effective scientific management in the system RAE-RDWS-RDIT.

## **THE STRUCTURE AND CONTENT OF THE PRACTICAL PART OF THE COURSE**

**Practical classes (36 hours)**

## **11 semester (36 hours)**

### **Theme 1. Introduction to entrepreneurship and innovation (4 hours)**

Innovative Elevator. Stages of development of innovative products in health care. Innovation in Russia. The concept of innovation. The place of innovation in the economy and health care. Definition of innovations in the Federal and regional legislation of the Russian Federation. Priority directions of development. Modern approaches to the definition of innovation and the model of the innovation process. Classification of innovations. The need for innovation in the activities of the enterprise and effects produced by innovation. The limits of technology and the technological gap. Business experience - the first year. How to start your business? Mistakes and difficulties at the beginning of business development. The difference between innovative business and traditional one. Planning your life trajectory.

### **Theme 2. Methods of generating entrepreneurial ideas (4 hours)**

Methods of generating ideas. Intuitive idea search - use in business. The relationship between economic cycles and innovation, long waves and cycles of conjuncture. Basic innovations and technological structures. Clusters of high technologies: the experience of the USA, priority areas of science, techniques and technologies of the Russian Federation, list of critical technologies of the Russian Federation. TRIS. MFI, morphological drawer. Examples.

### **Theme 3. Innovation support infrastructure (4 hours)**

Entrepreneurial activity and entrepreneurial abilities. Business environment and space. The history of the theory of innovative entrepreneurship. The form and function of innovative entrepreneurship. Economic organization. The nature of the firm. The company as a way of organizing business. Economic basis of innovative entrepreneurship. Small and large enterprises in innovative business. Measures of state support for entrepreneurial and innovative activities: grants, competitions, etc. in Primorsky Krai: PEZ, business incubators, technology transfer centers. FEFU business-incubator.

### **Theme 4. Project management (4 hours)**

The concept of innovation and innovation process. Approaches to the definition of innovation. Causes of uncertainty in decision-making processes and diffusion of innovation in a market economy. Types of innovation. Parameters of classification of innovations.

The concept of the project. The main stages of the project life cycle. Initiation of the project. Goal-setting in the project. Planning project. Methods of calendar planning (Gantt chart, Spider), methods of resource and financial planning. Work on the project in groups.

#### **Theme 5. Business project team management (4 hours)**

Innovative process and innovative activity. Characteristics, distinctive features, types of innovation process. Models of innovation process and their classification. Forms and phases of the innovation process. Stages of the innovation process and their characteristics. Scientific and technical activities and innovation. Organizational structures of innovative entrepreneurship.

Concept, features, types, stages of team formation. Signs of team effectiveness. Actions for influence on activity of teams. Development of the team work skills. Team building. Role in the team.

#### **Theme 6. Business law (4 hours)**

Forms of small business organization. The procedure of the legal entity registration. Features of the choice of economic and legal form. What you need to know at the stage of designing your business from a legal point of view. Intellectual property and intangible assets - market products, their characteristics and classification. Forms of promotion and implementation of innovations in the market. Pricing policy and communication tools of the innovation market.

#### **Theme 7. Commercialization of scientific and medical developments (4 hours)**

The composition and functions of the innovation infrastructure. Infrastructure of the innovation market. Elements of the infrastructure of scientific, technical and innovation activities. Financial infrastructure. Production and technological infrastructure. Features of development of innovative infrastructure



in Russia. State regulation of innovative activity. Innovative legislation of the Russian Federation. A special legal framework about innovation. Tools to regulate and support innovation. Financing the development of innovation. Financial innovation infrastructure development institutions

Stages of the commercialization process. Investors. Market. Methodological approaches to the formation of the RDS. Concepts of national innovation systems. Structure and main components of RDS. Models of the national innovation system. Evaluation of the effectiveness of the RDS. The formation of a single RDS in the EU. Global innovation system (GIS). Contours of development of RDS Russia and its place in the world. The model of RDS of Russia.

### **Theme 8. Business modeling (4 hours)**

Formation of the balanced business model: graphical model of the business process. Simulation model of a business process. Executable models of business processes. Priority of sales or production. Implementation of the business model. Types of business process models: functional, describing the set of functions performed by the system and their inputs and outputs; behavioral, showing when and / or under what conditions the business functions are performed, using categories such as system state, event, transition from one state to another, transition conditions, sequence of events; structural, characterizing the morphology of the system-the composition of subsystems, their relationship; information, reflecting the data structure-their composition and relationship. Basic principles of business process modeling.

### **Theme 9. Art of presentation (4 in class hours)**

Basics of public speaking. Types of presentations (linear – management, commercial, scientific, advertising, social and political), non-linear presentations, cyclic presentations, mixed presentations. The art of the presentation creating. Principles of presentations: modular, chronological, geographical, spatial. Preparing slides. Methods of presentation. Style and grammar. Perception of information on the screen. The color scheme of the presentation.

### **III. TRAINING AND METHODOLOGICAL SUPPORT INDEPENDENT WORK OF STUDENTS**

Educational and methodological support of independent work of students in the discipline "Commercialization of scientific research results" for the development of practical skills of students in the educational module includes creative independent work, in which students perform a creative project on the selected topic during the semester.

The theme of the creative project is formed by the results of the theme "Methods of generating entrepreneurial ideas" and should reflect the direction of the student.

To perform a creative project, students are be united into teams of 2 to 5 people.

As an additional task, students can take part in full-time conferences on the topic "Medical entrepreneurship".

### **IV. MONITORING THE ACHIEVEMENT OF THE COURSE OBJECTIVES**

Evaluation of the results of the independent work of students is organized by protecting the creative project in front of students-single-streamers, teachers, as well as invited experts acting entrepreneurs in the health care system.

To assess the quality of development of discipline in the conduct of control measures provided the following tools:

- Essay;
- Defense of the project.

#### **Essay task**

1. How do I understand the term "medical business"?
2. What is the benefits to the country / me if I become a medical entrepreneur?
3. Under what conditions could I become a medical entrepreneur and how

to create these conditions?

4. How do I benefit from the course "Commercialization of scientific research"?

### Project tasks

1. Project goals and objectives;
2. Stakeholders;
3. Team;
4. List of works;
5. Plan of works;
6. Project network schedule;
7. Financial planning (price, sales plan);
8. Responsibility matrix;
9. Organizational structure.

### MONITORING THE ACHIEVEMENT OF THE COURSE OBJECTIVES

No.	Controlled modules / sections / topics of the discipline	Codes and stages of competence formation		Evaluation tools	
				Current control	Interim certification / examination
1	Module 1. Organization of scientific activity in Russian universities	the ability and willingness to analyze the results of his own activity to prevent professional errors (GPC-5)	knows	Questioning, Presentation	Credit question 11 semester -1-5
			able to	IT №1 Test	IT №1 Test
			masters	Report	Presentation Colloquium
2	Module 2. Organization of work with scientific and technical information at the University. Patent and licensing activities	the readiness to analysis and public presentation of medical information based on evidence-based medicine (PC – 20)	knows	Questioning, Presentation	Credit question 11 semester -6-10
			able to	OA-1 Interview	PW-1 Test
			masters	Report	Presentation Colloquium

3	Module 3. Commercialization of scientific developments and its legal support	the ability to participate in researches (PC – 21)	knows	Questioning Test control	Credit question 11 semester -11-15
			able to	OA-1 Interview	PW-1 Test
			masters	Report	Presentation Colloquium
4	Module 4 Infrastructure of innovative activity of university Module 5 Features and prospects of development of student science at university	the willingness to participate in implementation of new methods and techniques aimed at protection of public health. (PC – 22)	knows	Questioning Essay	Credit questions 11 semester -1-6; 16-18
			able to	IT №2 Test	PW-1 Test
			masters	Report	OA-2 Colloquium
			able to	Project defense	PW-1 Test
			masters	Report Presentation	OA-2 Colloquium

Control and methodological materials, as well as criteria and indicators necessary for the assessment of knowledge, skills and characterizing the stages of formation of competencies in the process of development of the educational program are presented in Appendix 2.

## **V. LIST OF TEXTBOOKS AND METHODOLOGICAL SUPPORT OF THE DISCIPLINE**

### **Main literature**

1. Regulating the Commercialization of Human Genetics / Springer, Boston, MA 2016 [https://link.springer.com/chapter/10.1007/978-0-585-34586-4\\_14](https://link.springer.com/chapter/10.1007/978-0-585-34586-4_14)
2. Medical Students' Opinions About the Commercialization of Healthcare: A Cross-Sectional Survey / Springer Netherlands 2015 <https://link.springer.com/article/10.1007/s11673-016-9704-6>
3. Translational Challenges in Cardiovascular Tissue Engineering / Springer US 2016 <https://link.springer.com/article/10.1007/s12265-017-9728-2>

### **Additional literature:**

1. Ethics and Epistemology in Big Data Research / Springer Netherlands  
2016 <https://link.springer.com/article/10.1007/s11673-017-9771-3>

2. Perspective from Industry: AROMICS / Springer, Cham 2018  
[https://link.springer.com/chapter/10.1007/978-3-319-66647-1\\_5](https://link.springer.com/chapter/10.1007/978-3-319-66647-1_5)

### Internet Resources

1. Russian technology transfer network // [www.rttm.ru](http://www.rttm.ru)
2. Journal of Innovation / / / Innov\_W / [innov.html](http://innov.html)
3. Center for research and statistics of science // [www.csrs.ru](http://www.csrs.ru)
4. Economic newspaper // <http://www.neg.by>
5. Innovation Analytics and other materials / / / [lenta / innovation/](http://lenta.ru/innovation/)
6. Reference resource business support // <http://www.businessvoc.ru>
7. The center for development of innovation / <http://www.innovatika.ru>
8. Remote consulting // <http://www.dist-cons.ru>
9. Federal portal for research and innovation // <http://www.sci-innov.ru>
10. Using MS Office Power Point software
11. Using MS Office 2010 software
12. Use the videos of the website <http://www.youtube.com>
13. Legal-reference system Consultant plus.
14. Primorsky Krai of Russia:  
<http://www.fegi.ru/PRIMORYE/ANIMALS/bpi.htm>
15. Scientific electronic library: <http://www.elibrery.ru>
16. Central scientific medical library: <http://www.scsml.rssi.ru>
17. Medical Internet Resources: <http://www.it2med.ru/mir.html>
18. Publishing house "Medicine": <http://www.medlit.ru>

### LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	List of licensed software
Multimedia auditorium	Windows Seven enterprice SP3x64 Operating System

<p>Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m2 (Room for independent work)</p>	<p>Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.</p>
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In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs.

## **VI. GUIDELINES FOR DEVELOPMENT OF THE DISCIPLINE**

The theoretical part of the discipline "Commercialization of scientific research results" is revealed in lectures, as the lecture is the main form of training, where the teacher gives the basic concepts of the discipline.

The sequence of presentation of the material in the lecture, aimed at the formation of student indicative basis for the subsequent assimilation of the material in the independent self-work.

Students learn to analyze and predict the development of medical science, reveal its scientific and social problems in practical classes during the discussions at the seminars, in the discussion of abstracts and in the classroom with the use of active learning methods.

Practical classes of the course are held in all sections of the curriculum. Practical work is aimed at the formation of student skills of independent research. In the course of practical training, the student performs a set of tasks that allow to consolidate the lecture material on the topic under study, to gain basic skills in the field of building diets for different groups of the population, taking into account their physiological characteristics. Active consolidation of theoretical knowledge contributes to the discussion of problematic aspects of the discipline in the form of seminars and classes with the use of active learning methods. At the same time

there is a development of skills of independent research activities in the process of working with scientific literature, periodicals, the formation of the ability to defend their point of view, listen to others, answer questions, lead the discussion.

When writing essays, it is recommended to find their own literature for students. Essay reveals the content of the problem. Working on the essay helps to deepen the understanding of individual issues of the course, to form and defend their point of view, to acquire and improve the skills of independent creative work, to conduct active cognitive work.

The main types of independent self-work of students – is a work with literary sources and guidelines on the history of medicine, bioethical problems, on-line resources for a deeper acquaintance with the individual problems of development of medicine and bioethics. The results of the work are made in the form of essays or reports with subsequent discussion. Topics of essays correspond to the main sections of the course.

To conduct ongoing monitoring and interim certification, oral interviews and control essays are carried out.

## **VII. MATERIAL AND TECHNICAL MAINTENANCE OF DISCIPLINE**

Commercialization of Scientific Research	Monoblock Lenovo C360G-i34164G500UDK; projection Screen Projecta Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen 1920 x 1080; Flush interface with automatic retracting cables TLS TAM 201 Stan; Avervision CP355AF; lavalier Microphone system UHF band Sennheiser EW 122 G3 composed of a wireless microphone and receiver; Codec of videoconferencing LifeSizeExpress 220 - Codeonly - Non-AES; Network camera Multipix MP-HD718; Two LCD panel, 47", Full HD, LG M4716CCBA; Subsystem of audiocommentary and sound reinforcement; centralized uninterrupted power supply	Multimedia audience
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**SCHOOL OF BIOMEDICINE**

**TRAINING AND METHODOLOGICAL SUPPORT OF INDEPENDENT  
WORK OF STUDENTS**

**on discipline «Commercialization of scientific research results»**

**Specialty 31.05.01 «General medicine»**

**Form of study: full time**

**Vladivostok  
2016**



## Schedule of independent work on the discipline

No.	Date / Deadline	Type of independent work	Estimated norms of time for execution (hour)	Form of control
<b>11 semester</b>				
1	1-3 day	Essay	6 hours	OA-3-Report
2	4-6 day	Report of presentation on the essay topic	6 hours	OA-3-Report
3	7-9 day	Preparing for the credit. Project defense	6 hours	OA-1-Interview PW-1 – Test

### The list of essay topics

1. Psychology and ideology of entrepreneurship.
2. The concept and forms of innovative entrepreneurship.
3. The organizational phase of the establishment of small innovative enterprises.
4. Features of management of small innovative enterprises.
5. Innovative business and its results. Innovative product.
6. The process of innovation in a changing world.
7. System-forming processes in innovative entrepreneurship.
8. Subjects of innovative entrepreneurship.
9. The infrastructure of the market of innovations.
10. Technology transfer in innovative entrepreneurship.
11. Intellectual property as an object of innovation market.
12. Key success factors of an innovative enterprise.
13. Strategic management of innovative enterprise.
14. Management of marketing activities of innovative enterprises.
15. Financing of innovative activities of enterprises and organizations.
16. Evaluation of the efficiency of innovative enterprises.
17. Venture business.

### Approximate guidelines for writing and design of an essays

Essay is a creative activity of the student reproducing in its structure the research activities to solve theoretical and applied problems in a particular branch

of scientific knowledge. That is why the course certification work is an essential component of the educational process in higher education.

The essay is a model of scientific research, independent self-work in which a student solves a problem of a theoretical or practical nature, applying the scientific principles and methods of a given branch of scientific knowledge. The result of this scientific search may have not only subjective, but also objective scientific novelty, and therefore can be presented for discussion by the scientific community in the form of a scientific report or presentation at scientific-practical conferences, as well as in a form of research article.

Essay involves the acquisition of skills for building business cooperation, based on ethical standards of scientific activity. Purposefulness, initiative, disinterested cognitive interest, responsibility for the results of their actions, conscientiousness, competence - personality traits that characterize the subject of research activities corresponding to the ideals and norms of modern science.

The essay is an independent educational and research activity of the student. The teacher assists in a consultative manner and assesses the process and the results of the activity. Teacher provides an approximate topic of the essay work, specifies the problem and topic of research with a student or intern, helps to plan and organize research activities, assigns time and a minimum number of consultations.

The teacher receives the text of the essay for verification at least ten days before the defense.

Generally there is a certain structure of the essay, the main elements of which in order of their location are the following:

1. Title page.
2. Goal.
3. Table of Contents
4. List of abbreviations, symbols and terms (if necessary).
5. Introduction.
6. Main part.

7. Conclusion.
8. Reference list.
9. Appendixes.

The title page contains educational institution, graduating department, author, teacher or supervisor, research topic, place and year of the essay.

The title of the essay should be as short as possible and fully consistent with its content.

The table of contents (content) reflects the names of the structural parts of the essay and the pages on which they are located. The table of contents should be placed at the beginning of work on one page.

The presence of a detailed introduction - a mandatory requirement for the abstract. Despite the small volume of this structural part, its preparation causes considerable difficulties. However, this is a qualitatively executed introduction that is the key to understanding the entire work, which testifies to the professionalism of the author.

Thus, the introduction is a very crucial part of the essay. The introduction should start with a justification of the relevance of the chosen topic. As applied to the essay, the concept of "relevance" has one feature. From how the author of the essay can choose a topic and how correctly he understands and evaluates this topic from the point of view of modernity and social significance, characterizes his scientific maturity and professional preparedness.

In addition, in the introduction it is necessary to isolate the methodological basis of the essay, name the authors, whose works constituted the theoretical basis of the study. A review of the literature on the topic should show the author's thorough acquaintance with special literature, his ability to systematize sources, critically examine them, highlight the essential and determine the most important in the up-to-date state of knowledge of the topic.

The introduction reflects the importance and relevance of the chosen topic, defines the object and subject, purpose and objectives, and the chronological framework of the study.

The introduction ends with a statement of the general conclusions about the scientific and practical significance of the topic, the degree of its knowledge and sources, and the hypothesis being put forward.

The main part describes the essence of the problem, reveals the topic, determines the author's position, factual material is given as an argument and for display of further provisions. The author must demonstrate the ability to consistently present the material while analyzing it simultaneously. Preference is given to the main facts, rather than small details.

The essay ends with the final part called "conclusion". Like any conclusion, this part of the essay serves as a conclusion due to the logic of the study which is a form of synthesis accumulated in the main part of scientific information. This synthesis is a consistent, coherent presentation of the results obtained and their relation to a common goal and specific tasks set and formulated in the introduction. At this place there is a so-called "output" knowledge, which is new in relation to the original knowledge. The conclusion may include suggestions of practical matter, thereby increasing the value of theoretical materials.

So, the conclusion of the essay should contain: a) presents the conclusions of the study; b) theoretical and practical significance, novelty of the essay; c) indicated the possibility of applying the results of the study.

After conclusion it is acceptable to place the reference list of the literature used throughout. This list is one of the essential parts of the essay and reflects the independent creative work of the author of the essay.

The list of sources used is placed at the end of the work. It is made either in alphabetical order (by the name of the author or the name of the book), or in the order in which the references appear in the text of the prepared work. In all cases, the full title of the work, the names of the authors or the editor of publication are indicated if the writing team involved a group of authors, data on the number of volumes, the name of the city and publisher in which the work was published, year of publication, number of pages.

## **Methodical recommendations for the presentation preparation**

For preparation of presentation it is recommended to use: PowerPoint, MS Word, Acrobat Reader, LaTeX-bev package. The simplest program for creation of presentations is Microsoft PowerPoint. To prepare a presentation, it is necessary to process the information collected while writing the essay.

The sequence of preparation of the presentation:

1. Clearly state the purpose of the presentation.
2. Determine what the presentation format will be: live presentation (then how long it will be) or e-mail (what will be the context of the presentation).
3. Select the entire content of the presentation and build a logical chain of presentation.
4. Identify key points in the content of the text and highlight them.
5. Determine the types of visualization (pictures) to display them on slides in accordance with the logic, purpose and specificity of the material.
6. Choose the design and format the slides (the number of pictures and text, their location, color and size).
7. Check the visual perception of the presentation.

The types of visualization include illustrations, images, charts, tables. The illustration is a representation of a real-life visual. The images - as opposed to illustrations - are metaphor. Their purpose is to cause an emotion and create an attitude towards it, to influence the audience. With the help of well-designed and presented images, information can remain permanently in a person's memory. Chart is visualization of quantitative and qualitative relationships. They are used for convincing data demonstration, for spatial thinking in addition to the logical one. Table is a specific, visual and accurate data display. Its main purpose is to structure information, which sometimes facilitates the perception of data by the audience.

### *Practical hints on preparing a presentation*

- printed text + slides + handouts are prepared separately;

- slides -visual presentation of information that should contain a minimum of text and maximum of images that bring a meaning, to look visually and simply;
- textual content of the presentation - oral speech or reading, which should include arguments, facts, evidence and emotions;
- recommended number of slides 17-22;
- mandatory information for the presentation: the subject, surname and initials of the speaker; message plan; brief conclusions from all that has been said; list of sources used;
- handouts should be provided with the same depth and coverage as the live performance: people trust more what they can carry with them than disappear images, words and slides are forgotten, and handouts remain a constant tangible reminder; handouts are important to distribute at the end of the presentation; Handouts should be different from slides, should be more informative.

### **Evaluation criteria for essays.**

The stated understanding of the essay as a holistic copyright text defines the criteria for its evaluation: the novelty of the text; the validity of the source choice; the degree of disclosure of the issue essence; compliance with the requirements for registration.

**Essay novelty:** a) the relevance of the research topic; b) novelty and independence in the problem formulation, formulation of a new aspect of the well-known problem in the establishment of new connections (interdisciplinary, intra-subject, integration); c) ability to work with research and critical literature, systematize and structure research material; d) the appearance of the author's position, independence of assessments and judgments; d) stylistic unity of the text, the unity of genre features.

**The degree of disclosure of the question essence:** a) the plan compliance with an essay; b) compliance with the content of topic and plan of an essay; c)

completeness and depth of knowledge on the topic; d) the validity of the methods and techniques of work with the material; e) ability to generalize, draw conclusions, compare different points of view on one issue (problem).

**The validity of the source choice:** a) evaluation of the used literature: whether the most famous works on the research topic are involved (including recent journal publications, recent statistics, reports, references, etc.)

**Compliance with the requirements for registration:** a) How true are the references to the used literature, quotes; b) assessment of literacy and presentation culture (including spelling, punctuation, stylistic culture), knowledge of terminology; c) compliance with the requirements for the volume of essay.

**The reviewer should clearly state** the remarks and questions, preferably with references to the work (possible on specific pages of the work), to research and evidence that the author did not take into account.

**The reviewer may also indicate:** whether student has addressed the topic earlier (essays, written works, creative works, olympic works, etc.) and whether there are any preliminary results; how the graduate has conducted the work (plan, intermediate stages, consultation, revision and processing of the written or lack of a clear plan, rejection of the head recommendations).

**The student submits** an essay for review no later than a week before the defense. The reviewer is the teacher. Experience shows that it is advisable to acquaint the student with the review a few days before the defense. Opponents are appointed by the teacher from the students. For an oral presentation a student needs about 10–20 minutes (approximately as long as he answers with tasks for the exam).

**Grade 5** is given if all the requirements for writing and defending an essay are fulfilled: the problem is indicated and its relevance is justified, a brief analysis of different points of view on the problem under consideration is made and one's own position is logically presented, conclusions are formulated, the topic is fully disclosed, the volume is met, external requirements are met design, given the correct answers to additional questions.

**Grade 4** is given if the basic requirements for the essay and its defense are met, but there are some shortcomings. In particular, there are inaccuracies in the presentation of the material; or there is no logical sequence in the judgments; not sufficient volume of the essay; there are omissions in the design; additional questions for the defense are accompanied with incomplete answers.

**Grade 3** is given if there are significant deviations from the requirements for referencing. In particular: the topic is covered only partially; factual errors in the content of an essay or when answering additional questions; there is no output c.

**Grade 2** - the topic of an essay is not disclosed, a significant misunderstanding of the problem is found.

**Grade 1** - student's essay is not presented.

**The organization of independent work of students involves a number of individual homework (IHW) on a given topic.**

IHW is one of the forms of educational and scientific work of students. The purpose of the IHW is to teach students to connect theory with practice, to instill the ability to develop researching plans, to calculate various indicators and build forecasts on the basis of their analysis, to investigate the current situation and offer solutions to problems, to freely navigate in the modern economy, to present complex issues in a popular way.

The work is provided in paper form and is defended by the student. In the end, a pass grade is to be given.

The presentation of the material must meet the requirements for research work. The research should be based on authoritative sources, text is qualitatively worked out and edited (clarity, perceptibility, clarity, scientific style). The completeness of the material is taken into account. Registration of the executed IHM is made according to the standard of performance of course and final qualifying works of FEFU. The volume of tasks, etc is about 20-25 pages.

### **IHM No. 1.**

To carry out research work on the theme "national innovation system of the



state". The country of study is chosen at random by the student from the proposed list or in agreement with the teacher. The paper should consider the formation of NIS, the structure of NIS, the role of the state in the process of formation of NIS, the existing problems and opportunities to solve them.

List of countries: USA, UK, Sweden, Canada, Japan, Israel, India, China, France, South Korea, Hong Kong, Singapore, Germany.

### **IHM No. 2.**

To carry out research work on the topic "Characteristics of the infrastructure of scientific, technical and innovative activities in Russia: *element*". The element of infrastructure for the study is chosen arbitrarily by the student from the proposed list or in agreement with the teacher.

**Contents of infrastructure elements:** information support; system of coordination and regulation; financial and economic support; system of production and technological support and certification of high-tech products; system of promotion of scientific and medical developments and high-tech products; system of training and retraining.



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN  
FEDERATION  
Federal state autonomous educational institution  
of higher education  
**« Far Eastern Federal University »**  
(FEFU)

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SCHOOL OF BIOMEDICINE

**ASSESSMENT FUND**  
**on discipline « Commercialization of scientific research results »**  
**Specialty 31.05.01 «General medicine»**  
**Form of study: full time**

**Vladivostok**  
**2016**

## Passport of assessment fund

Completed in accordance with the Regulations on the Funds of Evaluation Assets of Educational Programs of Higher Education - Bachelor's Programs, Specialties, FEFU Magistrates, approved by order of the Rector No. 12-13-850 of May 12, 2015.

Competence and its code	Stages of competence formation	
the ability and willingness to analyze the results of his own activity to prevent professional errors (GPC-5)	Knows	Methods of analysis, finding the problem, designing the optimal sequence of actions to achieve the goal, methods of planning scientific activities, evaluation and control of it. Principles of independent decision-making in the field of management of research organization
	Able to	Use educational, scientific, popular science literature, internet for professional activities. Analyze the results of their own activities to prevent professional errors and critically evaluate modern theoretical concepts and trends in medicine. To implement the principles of personal responsibility for decisions made in the organization of scientific research.
	Masters	Methods of analysis of the outcomes of their own activities to prevent professional mistakes: possession of various managing functions: planning, organization, regulation, monitoring and controlling, having the ability to consciously choose the optimal strategy, etc
the readiness to analysis and public presentation of medical information based on evidence-based medicine (PC – 20)	Knows	The essence of the evidence based medicine; types of scientific sources of information; methods of evaluation of scientific sources of information; algorithm of monographic and review essay; features of the scientific text and its design requirements; ways of presenting numerical information
	Able to	To analyze and evaluate the information of scientific sources; to make a monographic and review essay on the topic of research; to analyze ways of presenting numerical data in terms of speed of perception, data volume, logic; to use text and graphic editors to present the results of the study; to create a presentation to the report on the results of the study.
	Masters	Skills of scientific text design; skills of determining the type of numerical data; skills of choosing the optimal way to represent numerical data using different types of tables and charts
the ability to participate in	Knows	The essence of research activities in medicine

researches (PC – 21)		and health care; stages of scientific medical research and their content; design options for scientific medical research; the nature of errors in the results of scientific medical research and the causes of their occurrence.
	Able to	Plan scientific medical research; anticipate errors in the results of scientific medical research and take measures to minimize them.
	Masters	Skills of sample formation using various methods; skills of using the simplest methods of randomization in the formation of comparison groups; skills of forming comparison groups by means of paired selection; skills of calculating and evaluating a set of indicators based on the results of the observational (cohort) study; skills of calculating and evaluating a set of indicators based on the results of the experimental study; skills of calculating and evaluating a set of indicators characterizing the validity of the diagnostic test.
the willingness to participate in implementation of new methods and techniques aimed at protection of public health. (PC – 22)	Knows	Norms of international law, the main provisions of the legal documents of the Russian Federation regulating research activities in medicine and health care, as well as work on the practical use and implementation of the results of scientific medical research; the nature and classification of costs associated with medical intervention; types of effectiveness of medical activities, their essence and content; features of clinical and economic research
	Able to	Evaluate medical interventions in terms of cost-benefit ratio
	Masters	Skills of clinical and economic analysis

## **MONITORING THE ACHIEVEMENT OF THE COURSE OBJECTIVES**

No.	Controlled modules / sections / topics of the discipline	Codes and stages of competence formation		Evaluation tools	
				Current control	Interim certification / examination
1	Module 1. Organization of scientific activity in Russian universities	the ability and willingness to analyze the results of his own activity to prevent professional errors (GPC-5)	knows	Questioning, Presentation	Credit question 11 semester -1-5
			able to	IT №1 Test	IT №1 Test
			masters	Report	Presentation Colloquium
2	Module 2.	the readiness to	knows	Questioning,	Credit question

	Organization of work with scientific and technical information at the University. Patent and licensing activities	analysis and public presentation of medical information based on evidence-based medicine (PC – 20)		Presentation	11 semester -6-10
			able to	OA-1 Interview	PW-1 Test
			masters	Report	Presentation Colloquium
3	Module 3. Commercialization of scientific developments and its legal support	the ability to participate in researches (PC – 21)	knows	Questioning Test control	Credit question 11 semester -11-15
			able to	OA-1 Interview	PW-1 Test
			masters	Report	Presentation Colloquium
4	Module 4 Infrastructure of innovative activity of university Module 5 Features and prospects of development of student science at university	the willingness to participate in implementation of new methods and techniques aimed at protection of public health. (PC – 22)	knows	Questioning Essay	Credit questions 11 semester -1-6; 16-18
			able to	IT №2 Test	PW-1 Test
			masters	Report	OA-2 Colloquium
			able to	Project defense	PW-1 Test
			masters	Report Presentation	OA-2 Colloquium

### Scale of assessment of the level of competence formation

Competence and its code	Stages of competence formation		criteria	indicators	Points
the ability and willingness to analyze the results of his own activity to prevent professional errors (GPC-5)	knows (threshold level)	Methods of analysis, finding the problem, designing the optimal sequence of actions to achieve the goal, methods of planning scientific activities, evaluation and control of it. Principles of independent decision-making in the field of management of research organization	Knowledge of methods of analysis, finding the problem, designing the optimal sequence of actions to achieve the intended objectives of the field of management of the organization of scientific research	knows the main ways of analysis, finding the problem, designing the optimal sequence of actions to achieve the intended goal in the field of management of scientific research	65-71
	able to (advances)	Use educational, scientific, popular science literature, the Internet network for professional	The ability to teach others how to analyze the results of their own activities to prevent professional mistakes	Able to implement the principles of personal responsibility for decisions to prevent	71-84

		activities. Analyze the results of their own activities to prevent professional errors and critically evaluate modern theoretical concepts and trends in medicine. To implement the principles of personal responsibility for decisions made in the organization of scientific research.	and critically evaluate modern theoretical concepts and trends in medicine	professional errors	
	masters (high)	Methods of analysis of the results of their own activities to prevent professional mistakes: possession of various managing functions: planning, organization, regulation, monitoring and controlling, having the ability to consciously choose the optimal strategy, etc	Knowledge of the methodology of analysis of the results of their own activities to prevent professional errors:	Owns various managing functions: planning, organization, regulation, monitoring and controlling, having the ability to consciously choose the optimal strategy, etc	85-100
the readiness to analysis and public presentation of medical information based on evidence-based medicine (PC – 20)	knows (threshold level)	Methods of evaluation, analysis, generalization and public presentation of the results of the research. Ways to determine the goals in the organization of scientific research	Knowledge of methods of processing, analysis, generalization and public presentation of the results of the research	Knows the basics of methods of processing, analysis, generalization and public presentation of the results of the research	65-71
	able to (advances)	To analyze, summarize and publicly present the results of scientific research on the basis of evidence-based medicine, as well as to develop a mechanism for the organization of scientific research	Ability to analyze, summarize and publicly present the results of scientific research on the basis of evidence-based medicine	able to analyze, summarize and publicly present the results of scientific research on the basis of evidence-based medicine	71-84
	masters (high)	Methods of analysis, generalization and public presentation of the results of scientific research. Principles of evidence-based medicine based on the search for solutions using theoretical knowledge and practical skills.	Possession of skills of analytical methods, generalization and public presentation of the results of scientific research. Principles of evidence-based medicine based on the search for solutions using theoretical knowledge and practical skills	knows how to apply professional knowledge in the field of research in the formulation and solution of problems on evidence-based medicine	85-100

		Methods of application of professional knowledge in the field of research in the formulation and solution of problems.			
the ability to participate in researches (PC – 21)	knows (threshold level)	Methods of analysis and evaluation of modern scientific achievements in solving scientific research. Methods of planning the system of organization of scientific research.	Knowledge of methods of analysis and evaluation of modern scientific achievements in solving scientific research.	Knows the basics of methods of analysis and evaluation of modern scientific achievements in solving scientific research	65-71
	able to (advances)	To analyze alternative solutions to research and practical problems, to assess the potential gains / losses of the implementation of these options. Assess risks in management decision-making	ability to analyze, generalize alternative solutions to research and practical problems, to evaluate potential gains/losses of these options.	Able to analyze alternative solutions to research and practical problems in the conduct of scientific research,	71-84
	masters (high)	Skills of analysis and evaluation of modern scientific achievements and results of activities in the conduct of scientific research. The ability to work effectively in a team and individually, as well as the willingness to lead a team created to solve problems.	Possession of skills of methods of analysis and evaluation of modern scientific achievements and results of scientific research, effective teamwork skills	knows the methods of analysis and evaluation of modern scientific achievements and results of scientific research.	85-100
the willingness to participate in implementation of new methods and techniques aimed at protection of public health. (PC – 22)	knows (threshold level)	Principles of participation in introduction of new methods and techniques aimed at protecting the health of citizens. Methods of application of professional knowledge in the field of scientific research in the formulation and solution of problems	Knowledge of the principles of participation in the introduction of new methods and techniques aimed at protecting the health of citizens	Knows the basics of the principles of participation in the introduction of new methods and techniques aimed at protecting the health of citizens	65-71

	able to (advances)	Use in the implementation of new methods and techniques aimed at protecting the health of citizens. To use scientific, scientific and technological results and intellectual potential in order to obtain new products, technology of its production.	Ability to use scientific, scientific and technological results and intellectual potential in order to obtain new products, technology of its production.	Able to use scientific, scientific and technological results and intellectual potential in order to obtain new products, technology of its production.	71-85
	masters (high)	Skills of use and introduction of new methods and techniques aimed at protecting the health of citizens. Methods of application of methods of expert assessments and forecasting of innovative solutions	Skills in the use and implementation of new methods and techniques aimed at protecting the health of citizens.	knows how to apply the methods of expert evaluation and forecasting of innovative solutions	85-100

### **Evaluation tools for interim certification**

#### **Questions for pass-fail exam (11 semester)**

1. What is "technology commercialization" and who are the participants of commercialization projects?
2. The main functions of the commercialization project manager.
3. The main stages of the commercialization process.
4. The main characteristics of the curves "Enthusiasm-time "and "Cost-time".
5. Differences between the concept of "Technology" for the author and the buyer.
6. Factors affecting the rate of research and amount of resources involved.
7. Typical business models used in the field of innovation.
8. Commercialization of research institutes and universities.
9. What are "commercialization strategies"?
10. Criteria for assessing the commercial potential of novel technologies.
11. Trends in high-tech markets.
12. Advantages of the developed products.
13. The role of intellectual property in commercialization.



14. Approaches to positioning of new technological goods depending on their features.

15. What are the "dominant advantages" of new products?

16. Pricing in commercialization projects.

**Criteria for grading evaluation of the student in the exam/competition in the discipline «Commercialization of scientific research results»**

<b>Exam grade</b>	<b>Requirements to the formed competences</b>
«excellent»	Grade "excellent" is given to a student, if he/she deeply and firmly learned the program material, exhaustively, consistently, clearly and logically presents it, is able to closely link the theory with practice, freely copes with tasks, questions and other types of application of knowledge, and does not complicate with the answer when modifying tasks, uses the material of monographic literature in the answer, correctly justifies the decision, has versatile skills and techniques of performing practical tasks;
«good»	Grade "good" is given to a student, if he/she knows the material, competently and essentially sets it without allowing significant inaccuracies in the answer to the question, correctly applies the theoretical provisions in solving practical issues and problems, has the necessary skills and techniques of their implementation;
«satisfactory»	Grade "satisfactory" is given to a student if he/she has knowledge only of the basic material, but did not learn its details, admits inaccuracies, insufficiently correct formulations, violations of logical sequence in the statement of program material, has difficulties at performance of practical works;
«unsatisfactory»	Grade "unsatisfactory" is given to a student who knows the significant parts of the program material, allows substantial errors, uncertain, with great difficulty performs practical work.

**Evaluation tools for current certification**

**Control tests** are designed for students studying the course

"Commercialization of scientific research results " .

Tests are necessary for both the control of knowledge in the process of the current interim certification, and for the assessment of knowledge, the result of which can be set off.

When working with tests, the student is asked to choose one answer out of three or four proposed. At the same time, the tests vary in their complexity. There are tests among the proposed ones containing several options for correct answers. The student must provide all correct answers.

Tests are designed for both individual and collective solutions. They can be used in the process and classroom, and independent self-work. The selection of tests necessary for the control of knowledge in the process of interim certification is made by each teacher individually.

Results of performance of the test tasks are evaluated by a teacher using a five-grade scale for certification or on system "credit" - "no credit". Grade "excellent" is given if the number of correct answers is more than 90% of the tests offered by the teacher. Grade "good" is given if the number of correct answers is more than 70% of the tests. Grade "satisfactory" is given if the number of correct answers is more than 50% of the tests offered to the student.

### **Example test tasks**

#### **1. The business plan of the innovative project is:**

Answer: a brief policy document providing an overview of the objectives, methods of implementation and expected results of the innovation project.

#### **2. The following methods of remuneration are used in innovation activity:**

Answer: material, labor, status

#### **3. The following forms of incentives are used in innovation activity:**

Answer: individual, collective

**4. The following concepts of motivation are used in innovation management:**

Answer: functional, procedural

**5. The "market challenge" model is based on the situation:**

Answer: innovations are focused on the requirements of consumers

**6. The basis of the model of "technological push" is the position of:**

Answer: innovations are focused on the available technological capabilities

**7. Important factors of diffusion of innovations are:**

Answer: effective communication channels; business orientation to higher profits

**8. The magnitude of the expected increase in profits from the introduction of innovations is 800 thousand rubles per year. The index of return from studies is 0.5%. Thus, the cost of the innovation project:**

Answer: 1600 thousand rubles.

**9. Venture capital financing is:**

Answer: risk financing of inventions in scientific and technical developments

**10. Venture financing is:**

Answer: providing a long-term loan without guarantees, but at a higher interest rate than in banks

**11. Venture capital is capital that:**

Answer: it is invested by specialized structures with their simultaneous participation in the management of young company whose assets are not quoted on the stock market

Answer: it is invested with a high degree of risk

**12. The internal rate of return characterizes:**

Answer: the discount rate at which the net discounted income of the project is zero.

**13. Elaboration of strategy of innovative development in organization is the basis for the creation and retention of competitive advantage**

Answer: Yes

**14. The main difference between the business incubator and other technopark structures is:**

Answer: development of an independent economic entity

**15. State innovation policy is designed to:**

Answer: to develop and implement economic, organizational, legal measures aimed at the development of innovations in production

**16. The state industrial policy consists of:**

Answer: regulation of relations between the state and industrial enterprises of the public and private sector

**17. State scientific centers operate:**

Answer: the status is assigned for 2 years with its extension (prolongation) according to the results of activity evaluation

**18. The duality of the innovation process is manifested in the fact that it:**

Answer: it combines the features of research and business

**19. The motto of violents:**

Answer: "Cheap but decent»

**20. Actions, which, first of all, should be directed to the innovative activity of the company:**

Answer: systematic, regular search for innovation opportunities; patent analysis

**21. Activities designed to energize the people working in the organization and encourage them to work effectively to enhance the goals defined in the plans is.....**

Answer: motivation

**22. Diffusion of innovation is:**

Answer: the spread of the mastered innovation in new fields of application

**23. For the active functioning of the national innovation system it is necessary to:**

Answer: to have a demand for innovation by the state and society; the

presence of legal acts on the stimulation and economic support of the innovation process

**24. For domestic enterprises in innovation is characterized by the model:**

Answer: external investment

**25. The following types of information are used to develop innovative projects:**

Answer: scientific and technical (patent); economic

**26. Modern Russia is characterized by a combination of technological structures such as:**

Answer: third, fourth, fifth

**27. For extensive development of the country's economy are necessary:**

Answer: availability of cheap labour; availability of cheap natural resources

**28. The problem of dynamic analysis solved by extrapolation suggests that the main factor of development is:**

Answer: time factor

**29. The company's costs for R & D consists of 5 million rubles per year, and the cost of turnover is 200 million rubles per year. What is the value of the coefficient of innovation (adaptability ) of the enterprise:**

Answer: 2.5%

**30. The profitability index of discounted costs characterizes:**

Answer: the ratio of total discounted cash inflows to total discounted cash outflows

**31. Innovation is:**

Answer: the final result of introduction of innovations in order to change the object of management and obtain economic, social, environmental, scientific and technical or other results

**32. Innovation has the following properties:**

Answer: scientific and technical novelty, commercial feasibility, industrial applicability

**33. Innovative strategy involves:**

Answer: gain competitive advantage by creating and implementing product and process innovations to meet existing or new needs

**34. Innovative development of the organization is a competitive advantage of:**

Answer: high grade

**35. Innovation activity differs from other types of entrepreneurial activity by:**

Answer: uncertainty and risk, impossibility of rigid goal-setting

**36. Innovative communications in the field of investment relations are differing in:**

Answer: increased risk and uncertainty of results, especially economic ones; non-traditional forms of investor-innovator relations

**37. Innovative communications arise when:**

Answer: the participants of the innovation process enter the market relations, share the result and bear the risks associated with innovation

**38. Innovative communications are:**

Answer: integrated activities for the exchange of information in the process of materialization and commercialization of innovations

**39. Innovative strategies are always effective**

Answer: no

**40. Innovation manager should have the following qualities:**

Answer: initiative, responsible, determinative, perseverance in achieving the goal; possesses organizational skills, ability to work with people

**41. Innovative management studies:**

Answer: methods and means of effective management of research, development, implementation, production and commercialization of innovations

**42. An innovative project is:**

Answer: the system of scientific, technical, organizational, legal, financial and economic documentation necessary for the implementation of innovations in

the enterprise (in the organization)

**43. The innovative process in the content aspect includes parallel and consistent implementation of the following stages: Idea > research > design developments > development > ..... > operation (service)**

Answer: productions\*

**: 44. The innovation process is**

Answer: the process of emergence, development and bringing scientific and technical ideas to their commercial use

**: 45. The innovation process is**

Answer: the process of emergence, development and bringing scientific and technical ideas to their commercial use

**46. Innovation risk is:**

Answer: the probability of losses when investing in the implementation of the product and process-innovation

**47. Innovation differs from other business processes:**

Answer: fundamental uncertainty

**48. Intellectual property includes:**

Answer: industrial property, copyright

**49. The intensive nature of economic growth is provided under the following conditions:**

Answer: outstripping the growth rate of production volumes over the growth rate of costs

**50. The basic forms of organization of the innovation process include:**

Answer: program-target; administrative-economic; Initiative

**51. The types of research work include:**

Answer: fundamental; applied

**52. The types of development work include:**

Answer: technical; commercial

**53. Types of planned calculations in the process of innovation planning include:**

Answer: product-themed; feasibility; space-time

**54. The types of technopolises include:**

Answer: innovation centers; science and research parks; technology centers

**55. Qualitative methods of forecasting include:**

Answer: method of fees; method of Delphi; method of scores

**56. The directions of innovative development include:**

Response: the use of chemicals; automation and mechanization; the electrification

**57. The directions of efficiency of innovative development include:**

Answer: Technical effect; Resource effect; Social effect; Economic effect

**58. To research human resources (personnel) are:**

Answer: professionally trained specialists directly involved in the production of scientific knowledge and the preparation of scientific results for practical use

**59. Innovations include:**

Answer: discoveries, inventions, patents, trademarks, documentation for new equipment, technology, results of marketing research

**60. The organizational and managerial levels of innovation management include:**

Answer: tactical

**61. The main tasks of innovation management include:**

Answer: identify reserves to reduce production costs; determine the environmental impact of innovation

**62. The main directions of commercialization of intellectual products, sources of receipt of objects of industrial property in circulation do not include:**

Answer: the transfer is free of charge from third parties

**63. The basic principles of innovation planning include:**

Answer: priority; continuity of planning; economic feasibility of planning; end-to-end planning

**64. The main elements of the innovation project include:**



Answer: a set of project activities; goals, objectives, reflecting the main directions of the project; the main indicators of the project, including performance indicators; organization of project activities

**65. The features of innovation in the field of IT include:**

Answer: the time of innovation is much less

**66. The forms of the innovation process include:**

Answer: simple intra-organizational; simple inter-organizational; advanced

**67. The functions of innovation management include:**

Answer: planning, organization, control, motivation, regulation, coordination

**68. Which of the following factors can be critical success factors in the development of an innovative organization?**

Answer: the presence of a unique technology; the presence of a patent-protected invention; the presence of highly qualified personnel

**69. Commercialization of innovation is:**

Answer: the process of bringing innovation to the market

**70 Commercial value of innovation is determined by:**

Answer: the value of the real profit received by the buyer in the commercialization of innovation

**71. The controlled indicators of the innovation project are:**

Answer: costs, results, terms

**72. Control over the implementation of the innovation project is aimed at:**

Answer: comparison of planned and actual indicators of the innovation project for strategic and operational adjustments

**73. A logical sequence of stages of the strategy formation:**

Answer: selection of general corporate strategy; formation of business strategy; formation of functional strategy; formation of operational strategies (within functional areas, departments, etc.)

**74. It is better to satisfy the needs of specific consumers, which are small**

**in volume:**

Answer: commutators

**75. Marketing innovations are:**

Answer: the choice of new communication channels to promote the product to the market; the development of a new product packaging

**76. The "Delphi" method refers to the methods:**

Answer: collective expertise

**77. The "Commissions" method refers to:**

Answer: methods of collective expertise

**78. At the majority of enterprises currently, innovation starts with:**

Answer: the acquisition of ready-made innovations

**79. The scientific and practical basis for choosing an innovation strategy is:**

Answer: the theory of the product life cycle, the market position of the enterprise

**80. The scientific and industrial complex created for production of new progressive production or for development of new high technologies on the basis of the close relations and interaction with the scientific and technical centers is .....**

Answer: Technopolis\*

**81. The scientific and technical strategy of the state is:**

Answer: the long-term course of the state scientific and technical policy, the formation of promising scientific and technical goals

**82. Scientific and technological progress is:**

Answer: the process of continuous development of science, technology, improvement of objects of labor, forms and methods of production

**83. Intangible assets are:**

Answer: a type of non-current assets that do not have a physical basis but represent value based on the rights of their owners

**84. The need for strategic management is due to:**

Answer: increasing uncertainty of long-term trends due to scientific and technological progress

**85. Unevenness (cyclicity) of economic development is connected with:**

Answer: with the change of generations of technology and qualitative changes in the labor force

**86. The new economy includes the following components:**

Answer: financial; information; innovative

**87. Organizational and managerial innovations are:**

Answer: new organizational structures, forms of labor organization, decision-making, control over their execution

**88. The main purpose of technoparks is:**

Answer: creating the necessary infrastructure for innovative business; providing consulting services to innovative firms

**89. The main purpose of the innovation incubators is:**

Answer: formation of knowledge-intensive firms

**90. The main requirements for management decisions are:**

Answer: target orientation; validity; security

**91. The main engine of innovation processes in the market economy is:**

Answer: gaining a competitive advantage

**92. The main principle of state funding of scientific and technical activities is:**

Answer: the combination of financial support of scientific organizations and targeted funding of specific scientific and technical programs and projects

**93. The main directions of commercialization of innovations are:**

Response: a contribution to the authorized capital of a business object; transmitting gratuitously from a third party; transfer for the implementation of joint activities

**94. The main disadvantages of collective expert methods are:**

Answer: subjectivity, focus on authoritative experts

**95. The main features of scientific and technical innovation are:**

Answer: novelty, compliance with market needs, profitability

**96. The main forms of planning the implementation of the innovation project are:**

Answer: business plan; feasibility study

**97. Features of venture financing are:**

Answer: venture investor assumes only commercial risk; venture investor invests for no more than 5-7 years; venture investor does not seek to acquire a controlling stake; venture financing does not provide collateral

**98. Features of innovation as an object of management are:**

Response: the uncertainty of the results, multivariate, likelihood

**99. The difference between venture financing and strategic partnership is:**

Answer: placement in the form of a share contribution to the authorized capital of the company

**100. Evaluation of the innovative potential of the enterprise (organization) is carried out according to the following indicators:**

Answer: the cost of research and development work, the number of patents, copyright certificates, the number of scientific and technical personnel

**101. Evaluation of the economic efficiency of innovation is necessary:**

Answer: to select an innovative project for its implementation; to assess the impact of innovation on the financial results of the enterprise

**102. Evaluation of the effectiveness of the innovation project should be carried out on the principle of:**

Answer: "with project-without project»

**103. The period of calculation of the effectiveness of the innovation project is determined by:**

Answer: a period of moral aging and loss of competitiveness of the product or process-innovation

**104. Pioneers in the market:**

Answer: exploiters

**105. The indicators of evaluation of the commercial efficiency of the innovation project are:**

Answer: net present value, internal rate of return; rate of return, payback period

**106. Sequence in order of increasing the risk of obtaining the expected scientific, technical and economic effect from the implementation of the following innovative measures:**

Response: improving the quality of manufactured products through pseudodevice; increased technical and organizational level of production through the introduction of process-improving innovations; development of modifications of the basic product-and process-innovation; development of new basic innovations that determine the transition to a new technological mode

**107. The sequence of types of documentation developed during the implementation of the innovation project:**

Answer: terms of reference; technical proposal; preliminary design; technical project; detailed design

**108. Sequence of actions in the implementation of the strategic process:**

Answer: SWOT analysis; identification of key points on the basis of strategic analysis; formation of strategy options and their evaluation; selection of the best strategy options; provision of strategy with resources

**109. The sequence of innovative structures on the increasing volume of innovative services and complexity**

Answer: incubators; industrial parks; science parks; regions science and technology

**110. The sequence of the following cycles in order of increasing importance:**

Answer: life cycles of specific products; cycles of economic development of individual industries and enterprises; cycles of economic development of individual countries; cycles of technological waves

**111. The sequence of factors of economic growth according to their**

**importance (in the order of its reduction):**

Answer: innovations (inventions); the volume of fixed capital; the level of education and training of population; the quantity and quality of natural resources; improved use of resources.