

GETTING ON IN ENGLISH (intermediate)

~~A~~ ijklmnnooijklmnnoo
abcde
d
c
b
a
**GETTING
ON IN ENGLISH**
(intermediate)

abcde
fgh

Getting on in English

(intermediate)

Спілкуємось

англійською мовою

(середній рівень)

Видання четверте
(доповнене і розширене)

*Затверджено Міністерством освіти і науки України
як підручник для студентів вищих
навчальних закладів*

Львів
Видавництво “Растр-7”
2011

УДК 811.111 (075.8)
ББК – 81.2 Англія 73

*Затверджено Міністерством освіти і науки України як
підручник для студентів вищих навчальних закладів
(Лист № 1.4/18 – Г – 1463.1 від 5. 09. 2007 р.)*

Рецензенти:

Кияк Тарас Романович, доктор філологічних наук, професор, завідувач кафедри теорії та практики перекладу з німецької мови Київського національного університету імені Тараса Шевченка;

Помірко Роман Семенович, доктор філологічних наук, професор, завідувач кафедри французької філології Львівського Національного університету імені Івана Франка;

Андрейчук Надія Іванівна, кандидат філологічних наук, доцент, завідувачка кафедри прикладної лінгвістики Національного університету “Львівська політехніка”;

Бик Ігор Степанович, кандидат філологічних наук, доцент, завідувач кафедри іноземних мов факультету міжнародних відносин ЛНУ ім. Ів. Франка;

Спілкуємося англійською мовою (середній рівень) (За редакцією І. Байбакової, О. Гасько, М. Федоришина). Видання четверте (доповнене і розширене). Підручник. – Львів: Видавництво „Растр-7”, 2011. – 276 с.
ISBN 978-966-2004-59-5

Автори: Байбакова І.М., Балацька Л.П., Барабаш О.В., Бусько М.Б., Василик С.В., Вдовін В.В., Вислободська І.М., Водарська Н.М., Гасько О.Л., Головко Н.П., Запотічна М.І., Ільницька Л.В., Ільчишин Н.М., Казимира З.І., Ключковська І.М., Кравець С.Ф., Лінник-Паммер Л.В., Магдач З.Т., Мазур О.П., Миськів І.С., Морська Н.О., Мукан Н.В., Олексів Г.Д., Павленко М.І., Пасічник Г.П., Пастирська І. Я., Підлісецька Л.Б., Савенко О.М., Сасенюк Ю.В., Федоришин М.С., Хім'як Г.М., Ярема О.В., Яремко Г.В.

Підручник призначений для вищих навчальних закладів України, які здійснюють підготовку фахівців з різних спеціальностей. Укладачами підручника враховані загальноєвропейські рекомендації з мовної освіти, щодо поліпшення рівня професійного спілкування іноземною мовою. Підручник складається з шести частин: “Професія інженера”, “Лабораторія”, “Українські імена у світовій науці”, “Науково-дослідна робота студентів”, “На науковій конференції”, “Професійна етика”.

ISBN 978-966-2004-59-5

©Видавництво „Растр-7”, 2011

UNIT 1. ENGINEERING PROFESSION

Task 1.1. Discuss the following questions in small teams, write down all the ideas, and present them to the whole group after the discussion:

- a) Why have you chosen this speciality?
- b) What do you know about the history of your institute / department?
- c) What can you say about the staff of your institute and subjects taught at it?
- d) What can you say about academic facilities at your institute?
- e) What do you know about the development of science you major in and the most famous people who greatly contributed to this development?
- f) Speak about advantages and disadvantages of work in the branch of industry you are going to work for.

SECTION I. AURAL COMPREHENSION

Task 1.2. Listen to the text “Some Problems of Higher Education” and answer the following questions:

1. What kinds of discrimination existed in educational system during its history?
2. Why were numerous higher technical schools being established during the 20th century?
3. What main problems do graduates face immediately after graduating from a higher school?
4. What can a higher school do for the enterprise it co-operates with?
5. What does an active attitude towards studying mean?
6. What does a graduate need in order to make a brilliant career (according to this text)?

SECTION II. USE OF THE ESSENTIAL VOCABULARY

Task 1.3. Memorise the essential vocabulary to the topic “Engineering Profession”, and translate the sentences containing it:

1. **accommodate smth. to** – пристосовувати – to adapt, adjust, change a plan so that it fits with smth. else, e.g. *I will accommodate my plans to yours.*
2. **apply** – 1.застосовувати, 2.звертатись до, подати заяву – 1.to use, utilize, make practical use of , 2.to request, e.g. *Doing the research, one should apply theoretical knowledge to practice. Has he applied for this job?*
application – 1.застосування, 2.заява – 1.making practical use of, 2.formal request, e.g. *The application of harmful production technologies should be banned. Your application has not been considered yet.*
3. **apprenticeship** – учнівство, навчання професії – time of being an apprentice, e.g. *Craftsmen learned their skills through apprenticeship.*
apprentice – учень – a person learning a craft, e.g. *The apprentice is as skilled as the master.*
4. **be based on** – базуватися – use as a basis for, e.g. *Scientific discoveries are usually based on thorough investigation.*
5. **be concerned with** – мати справу з, бути пов’язаним з – have relation to, be busy with, e.g. *This work is concerned with various kinds of computing machines.*
6. **craftsman** – майстер, ремісник – a person skilled in a craft; handy man, e.g. *A successful engineer should be both a craftsman and a scientist.*
7. **create** – творити, створювати – bring into existence; make smth. new or original, e.g. *This department has created favourable conditions for experimental work.*
creative – творчий – having power to create, e.g. *An engineer must possess creative and imaginative nature.*
8. **customer** – клієнт, покупець – a shop’s or firm’s customers are the people who buy its goods, e.g. *They install the equipment on the customer’s premises.*
9. **current** – струм – flow of electricity, e.g. *The current is cut off.*
current (adj.) – сучасний, поточний – belonging to the present time; contemporary, latest, up-to-date, e.g. *You should make a report on your current research work.*
10. **deal with** – мати справу, стосуватися, справлятися – take action about; be about or concerned with; do business with, e.g. *That man is easy to deal with. How shall we deal with this problem?*

11. **do without** – обходитися – manage without, e.g. *Nowadays it is not possible to do without computers.*
12. **design** – проектувати, планувати – prepare a sketch, plan, etc.; set apart, intend, plan, e.g. *He designs engines for a large car manufacturing company.*
13. **distribute** – розподіляти – to divide smth. and share it out among a number of people; to put into groups or classes, e.g. *Organizers plan to distribute posters and leaflets.*
14. **efficiency** ефективність – state or quality of being efficient, e.g. *High level of efficiency is required in any kind of work.*
efficient – ефективний – capable of doing smth. well without wasting time or energy, e.g. *This method is considered to be most efficient.*
15. **equip** обладнувати, забезпечувати – to provide with, e.g. *Students are to be equipped with skills and knowledge within their specialisation.*
equipment – обладнання – all the things needed or used for a particular job or activity, e.g.
Here students learn how to handle modern equipment.
16. **employ** – наймати – to hire, engage, e.g. *The company employs eighteen staff.*
employment – забезпечення роботою, зайнятість, працевлаштування – employing or being employed; one's regular work or occupation, e.g. *Our graduates will not have problems with employment.*
employer – працедавець – a person who employs others; e.g. *A successful employer involves employees in discussing problems and generating ideas for their solution.*
employee – службовець – a person who is employed;
17. **ensure** – забезпечувати, гарантувати – to make certain of getting or achieving, e.g. *This university ensures to its undergraduates the practical training at industrial enterprises.*
18. **extensive** – широкий, просторий – great in scope // covering a wide area, e.g. *Extensive research has been done in this field of science.*
19. **experience** – досвід – the knowledge, skill or feeling obtained through direct impressions or practice, e.g. *In most cases, applicants for a job are required to have previous professional experience.*
experienced – досвідчений – possessing skills or knowledge because of having done something for a long time, e.g. *Experienced and qualified specialists are always in great demand.*
20. **include** – охоплювати – to comprise or contain as a part of a whole, e.g. *The course of programming includes both lectures and practical classes.*
21. **increase** – збільшувати – to become greater in size, amount, number, value, degree etc., e.g. *Automation of production processes increases labour productivity.*

22. **invent** – винаходити – to devise, originate (a new device, method etc.) e.g. *Morse invented the telegraph.*
- invention** – винахід – something invented, e.g. *Invention of the wheel is one of the greatest achievements of mankind.*
- inventor** – винахідник – the one who has invented something, e.g. *Inventors register their inventions in the Patent Office.*
- inventive** – винахідливий – able to generate new, different or interesting ideas, e.g. *An engineer must be inventive.*
23. **involve** – включати в себе, запукати до – to include, concern, e.g. *Students are involved in research work.*
24. **install** – встановлювати, монтувати – to set in position for use, e.g. *Several new computers were installed in this study-room last month.*
- installation** – установка - the act of fitting a piece of equipment somewhere, e.g. *The installation of a new device took much efforts and time.*
25. **level** – рівень – a position in a scale of importance; a relative position in respect to some norm in a scale of estimating, e.g. *This higher educational establishment is famous for its high teaching level.*
26. **manage** to do – змогти зробити, вдається зробити – to succeed in accomplishing or handling, but with difficulty, e.g. *How did you manage to fulfill this task in such a short period of time?*
27. **manufacture** – виробляти – to make things on a large scale by hand or machine or both, e.g. *They started manufacturing a wider range of goods.*
- manufacturing** – виробництво, виробничий – the process or business of producing goods in factories, e.g. *Computers are widely used at manufacturing enterprises.*
28. **occupation** – заняття, фах, рід занять – an activity by which one earns one's living or fills one's time, e.g. *You should be very thoughtful choosing your future occupation.*
29. **opportunity** – слушна нагода, сприятлива можливість – a set of circumstances providing a chance or possibility, e.g. *Will you have an opportunity to use a computer?*
30. **point of view** – точка зору – someone's own personal opinion or attitude about something, e.g. *There exist different points of view on the utilization of atomic energy.*
31. **produce** – виробляти – manufacture, e.g. *The factory produces 100 cars a week.*
- production** – виробництво – the process of making or growing things to be sold as products, or the amount that is produced, e.g. *Production of these goods has increased lately.*
32. **prospects** (pl) – плани на майбутнє, перспективи – chances of future success, e.g. *He has excellent prospects for a successful career in radio engineering.*

33. **research** – дослідження – serious study of a subject, that is intended to discover, e.g. *He is doing research in the field of microelectronics.*
34. **require** – вимагати – to need something, e.g. *More experimental data are required.*
requirement – вимога – something that is needed or asked for, e.g. *What are the requirements to performing this work?*
meet requirements – відповідати вимогам –, e.g. *This work meets all the requirements.*
35. **science** – наука – knowledge about the world especially based on examination and testing, and facts that can be proved, e.g. *Third-year students study special subjects in their field of science.*
scientific – науковий – about or connected with science, or using its methods, e.g. *Students should be able to read scientific literature in foreign languages.*
scientist – вчений – someone who works or is trained in science, e.g. *Ukrainian scientists are known all over the world.*
36. **source** – джерело – a thing, place, activity etc. that you get something from, e.g. *Books are a source of wisdom and knowledge.*
37. **skill** – майстерність, вміння, навик – an ability to do something well, e.g. *In the past craftsmen learned their skills through apprenticeship.*
skillful – майстерний –, e.g. *This device requires skillful handling.*
38. **train** – виховувати, навчати, готувати, готуватися – to teach someone or be taught the skills of a particular job or activity, e.g. *"Lviv Polytechnic" trains highly qualified engineers.*
training – підготовка – the process of teaching someone, e.g. *This institute gives training in electronics.*
39. **vocation** – професія – any trade, profession or occupation, e.g. *What is your vocation?*
vocational – професійний –, e.g. *Before entering the university , he finished a technical vocational school.*

Task 1.4. Complete the words to match the definitions given:

1. time of being an apprentice a _____ t _____ p
2. to divide smth. and share it out among a number of people d _____ t _____ u _____
3. a person who employs others e _____ r

- | | |
|--|-----------|
| 4. chances of future success | r-----s |
| 5. any trade, profession or occupation | v-----i-- |
| 6. a person skilled in a craft | r-----m-- |
| 7. state or quality of being efficient | f-----y |

Task 1.5. Match the following words with their definitions:

- | | |
|-------------------|---|
| 1. to apply | a) to produce things on a large scale |
| 2. current | b) an ability to do smth. well |
| 3. to manufacture | c) the act of fitting the piece of equipment |
| 4. occupation | d) flow of electricity |
| 5. point of view | e) things needed or used for a particular job or activity |
| 6. skill | f) knowledge, skills obtained through practice |
| 7. equipment | g) someone's personal opinion |
| 8. installation | h) to make practical use of |
| 9. experience | i) serious study of a subject |
| 10. research | j) an activity by which one earns one's living |

Task 1.6. Match each word in section A with one of a similar meaning in section B:

A	B
1. experienced	a) administration
2. management	b) to increase
3. to employ	c) profession
4. to enhance	d) to contain
5. manufacture	e) practiced
6. research	f) to fix
7. vocation	g) production
8. advanced	h) progressive
9. to include	i) investigation
10. to install	j) to hire

Task 1.7. Match each word in section A with one of an opposite meaning in section B:

A	B
1. an apprentice	a) limited
2. to create	b) clumsy
3. an employee	c) inefficient
4. extensive	d) to decrease
5. to manage to do smth.	e) an employer
6. skillful	f) to dismantle

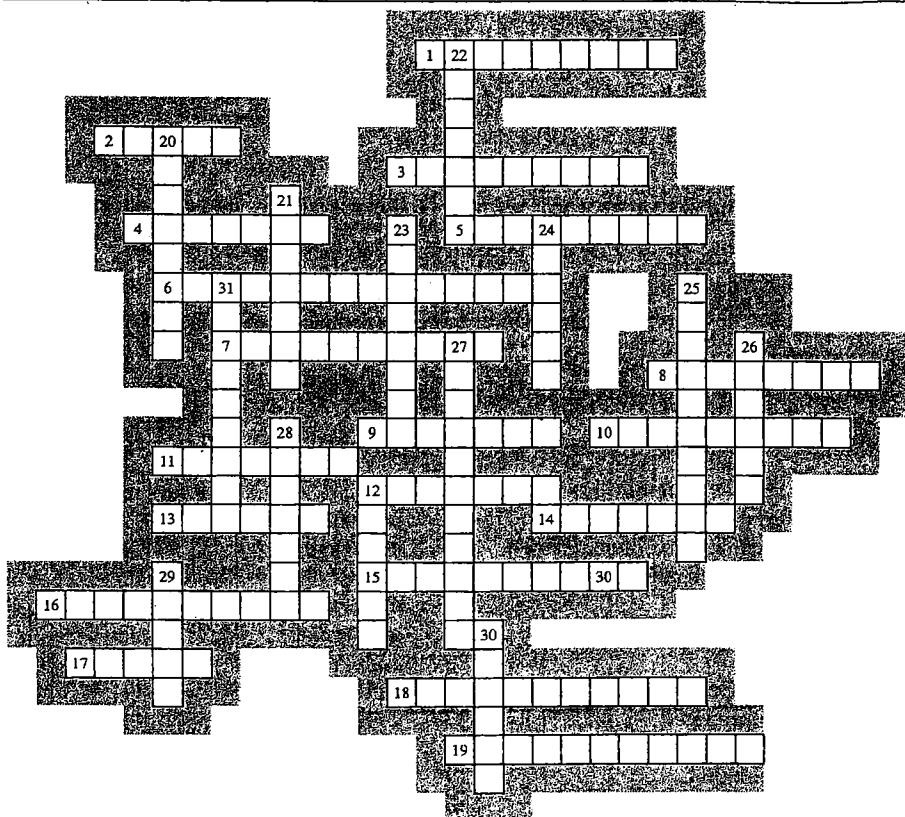
- | | |
|----------------|------------------------|
| 7. to increase | g) unemployment |
| 8. to install | h) a master |
| 9. efficient | i) to fail to do smth. |
| 10. employment | j) to destroy |

Task 1.8. Form the derivative words using the following suffixes and translate them:

- ion (-tion, -ation) : create, distribute, produce, invent, install, accommodate;
- ment: involve, develop, employ, require, equip, manage;
- er(or) : create, design, deal, manufacture, train, use, employ, manage, research;
- al: education, profession, vocation;
- ly: creative, current, efficient, extensive, scientific, skillful.

Task 1.9. Do the crossword puzzle, translating the following words into English:

	Across		Down
1	майстер, ремісник	20	винаходити
2	майстерність, вміння, навик	21	збільшувати
3	вчений, науковець	22	наука
4	виробляти	23	вимагати
5	широкий	24	професія
6	учнівство	25	досвід
7	заняття, фах	26	наймати
8	дослідження	27	слухна нагода
9	включати в себе, заливати	28	струм
10	ефективний	29	виховувати
11	охоплювати	30	джерело
12	встановлювати	31	перспективи
13	забезпечувати		
14	виробляти		
15	ефективність		
16	розділяти		
17	обладнувати		
18	виробляти		
19	пристосовувати		



Task 1.10. Fill in the gaps using active vocabulary from the list: ensure, manage, experience, occupation, accommodate, employer, efficient, prospects, installed, design, training, invention, require, craftsmen, involved.

1. The architect showed us her ... for the new theatre.
2. You must find a more ... way of organizing your time.
3. Please ... that all the documents are in order.
4. Should you have any special requirements, our staff will do their best to ... to them.
5. The car factory is a large ... in this town.
6. All the furniture we sell is individually made by
7. More than 100 people were ... in the project.
8. We are sorry we didn't ... to see you while we were in Ternopil.
9. She is ... to be an engineer.

10. It's an ... not to be missed.
11. Please indicate your ... on the form.
12. Do you ... any assistance?
13. The job offers a good salary and excellent
14. We are waiting to have new computers
15. Books had to be written by hand before the ... of printing.

SECTION III. APPLIED GRAMMAR

Main points: INFINITIVE, COMPLEX OBJECT, COMPLEX SUBJECT FORMS OF INFINITIVE

	INDEFINITE	CONTINUOUS	PERFECT	PERFECT CONTINUOUS
ACTIVE	to build	to be building	to have built	to have been building
PASSIVE	to be built	-----	to have been built	-----

1. The company will have **to build** a new trading centre next year.
2. The company is said **to be building** a new trading centre now.
3. The company is said **to have built** a new trading centre last year.
4. The company is said **to have been building** this trading centre for two years.
5. A new trading centre is said **to be built** here next year.
6. The new trading centre is said **to have been built** two months ago.

Task 1.11. FUNCTIONS OF THE INFINITIVE. Read the sentences, translate them into Ukrainian and put questions to the underlined words:

Subject: To patent an invention means to register it in the Patent Office.

Part of the Predicate: Their task was to design a new academic building. Students must take four exams during this examination session.

Object: He wants to create a new computer game.

Attribute: The department bought computers to be installed in this laboratory.

Adverbial Modifier: (In order) to compile a program, you should know the programming language.

COMPLEX OBJECT

Read and compare these sentences:

I noticed that he entered the laboratory. I noticed him enter the laboratory.

The statements are adequate, but they differ in structure. The first sentence is complex, and the second one is simple with the so-called complex object "him enter" which consists of a noun or a pronoun in the objective case and an infinitive with or without particle "to". The second sentence is more characteristic of modern English. The verbs followed by a complex object can be subdivided into three groups:

(a) the verbs expressing a will, requirement, request or permission (to want, desire, require, demand, request, allow, permit, etc.) which are followed by the infinitive with the particle "to", e.g.

His parents want him to become a manager.

(b) the verbs of mental perception (to know, think, believe, consider, find, expect, suppose, etc.) which are followed by the infinitive with the particle "to", e.g.

We suppose her to be working on her course project now.

(c) the verbs of sense perception (to see, watch, notice, hear, feel, etc.) and verbs "to let" and "to make" which are followed by the infinitive without "to", e.g.

I've heard them speak German.

Task 1.12. Choose proper forms to fill out the gaps:

1. They saw several students of the faculty in the computer class.
a) to work b) work c) to have worked

2. We suppose the recent sensational achievements in genetics with the progress in mathematics.
a) to be connected b) to have connected c) to connect

3. Scientists consider the concept of function of great importance not only in pure mathematics but also in practical application.
a) be b) to be c) have been

4. They didn't expect him such complicated computer operations.
a) perform b) to be performed c) to perform

5. I heard you the main issues of your diploma project with your supervisor.
a) discuss b) to be discussed c) to have discussed

6. My research supervisor wants the report for the scientific conference in three weeks.
a) to complete b) complete c) to be completed

7. We think them no problems with finding jobs according to their qualification.
 a) has b) to be having c) to have
8. The specialists watched the new measuring device in the laboratory.
 a) to be tested b) be tested c) have been tested
9. They know Karl Frederick Gauss such problems of applied mathematics as passing light through a system of lenses.
 a) to investigate b) to have investigated c) to be investigated
10. The lecturer wished the listeners their views and ideas on the subject.
 a) to exchange b) to be exchanged c) exchange

COMPLEX SUBJECT

Read and compare these sentences:

They say that you have already defended your diploma project.	You are said to have already defended your diploma project.
--	--

The statements are adequate. The difference lies in their structure. The first sentence is complex and the second one is simple with the so-called complex subject ("you... to have defended") where the infinitive is always used with the particle "to". The verbs which may function as predicates in sentences with a complex subject can be subdivided into the following groups:

(a) *the verbs of sense perception* (to see, notice, observe, hear, etc.) in Passive Voice:

He was seen to enter the dean's office.

(b) *the verbs of mental perception* (to know, think, believe, consider, find, expect, assume, suppose, etc.) in Passive Voice:

She is known to have been working at this department for twenty years.

(c) *the verbs "to say", "to report", "to want", etc.* in Passive Voice:

They were said to have been invited to this conference.

(d) *the verbs "to seem", "to appear", "to happen", "to prove", "to turn out", etc.* in Active Voice:

He seems to have failed his exam in maths.

(e) *the expressions "to be sure", "to be (un) likely", "to be certain"*:

She is sure to complete her course project next week.

Task 1.13. Use Complex Subject instead of the subordinate clauses, e.g.:

- It is known that the Faculty was founded in 1993.
 - The faculty is known to have been founded in 1993.
1. It is considered that mathematics is a handyman for all sciences.
 2. It seems that all modern mathematics concentrates around the concept of function.
 3. It was reported that the progress in microelectronics had given rise to progress in data processing machinery.
 4. It is believed that programming is the process of preparing sets of instructions.
 5. We are sure that our students will apply their theoretical knowledge to practice in the laboratories of the faculty.
 6. It is likely that they have done all necessary calculations.
 7. It is known that the invention of the calculus is sometimes ascribed to two men, Newton and Leibniz.
 8. It is said that Euclid's *Elements* is better known than any other mathematical book.
 9. It was stated that mathematics experienced a very strong influence of other sciences.
 10. It is certain that the word "computer" has come from a Latin word which means "to count".

Task 1.14. Read the texts and do the following tasks:**A. Define the forms of the infinitives used.**

Young people have ambitions **to become** specialists in various fields of human activity. Lviv Polytechnic National University is one of the best schools of higher learning for those who wish **to dedicate** their lives to science and engineering. It is known **to have trained** a lot of graduates who became famous scientists and outstanding engineers. Most young people **are likely to find** here a field of study to their liking.

The University offers courses in more than 50 subject areas. A list of the main subject areas **one can choose** to major in **may be found** in the text about LPNU in *Getting on in English*, a textbook for first-year students. **To be enrolled** in the University one must pass entrance exams **to testify** to the effect that he or she has the necessary knowledge required for them to be able to master the material **to be taught** at the undergraduate level leading to the award of a bachelor's degree after a four-year course of studies. Those who wish **to obtain** a specialist's degree or gain a master's degree have **to continue** their study and research for a further year or two depending on the programme of their choice. The curricula of the courses in each subject area are constantly revised and updated **to take** into account achievements in science and new developments in technology.

During the undergraduate course the would-be researchers and engineers are taught fundamentals of the fields of science **to form** a sound scientific basis for their future specialities. In many cases a systems approach to subject areas is practised in

order **to develop** student's ability **to reason**. For instance, **to understand** how radio works, it is more important **to understand** the function of each unit than **to know** what components are used. **This is known to be** a systems approach to electronics. Similar examples can be given to illustrate the peculiarities of other subject areas.

B. Define the functions of the infinitives printed in bold type:

To master the main principles of scientific research is the major task for graduate students who qualified **to follow** a master's course. Students **should know** that **to understand** many complicated phenomena in terms of a few simple principles scientists develop theories. But **to be taught** basic theories is not sufficient for one **to make** a good specialist. So **to be provided** with experimental evidence for the theoretical ideas students are made to carry out more and more complicated experiments.

Knowledge of a foreign language is essential for a specialist with a university degree. So the curriculum in engineering includes a foreign language as an obligatory subject **to be taken** by every student. And the would-be highly qualified specialists are glad **to be given** an opportunity **to improve** their knowledge of a foreign language or **to take** a second foreign language. Some undergraduates are likely **to be learning** two foreign languages simultaneously. English is the most popular with students of all specialities. The course aims **to develop** all four skills through a series of tasks and activities that encourage students to combine their knowledge of English with their technical knowledge.

Graduates of LPNU **can be employed** in research institutions, industrial establishments and service sector. The high standards of education provided by the University enable them **to be** fully competitive on both the domestic and international markets in the fields of manufacturing and service industries as well as in R and D activities. A diligent student is sure **to get** a good job after graduating from the University.

Task 1.15. Different categories of verbs are followed by different "patterns". Some verbs can be followed by another verb in the -ing form (e.g. *He enjoys playing computer games*), others by **to + the infinitive** of another verb (e.g. *She wants to leave*). Look at the structures which follow predicates in the sentences and match them to the following patterns:

- a). subject + modal or auxiliary verb + infinitive;
- b). subject + verb + to-infinitive;
- c). subject + verb + object + to-infinitive;
- d). subject + verb +object + infinitive (without to).

1. He wants to major in electronic engineering.
2. We asked him to help us find a solution to this problem.
3. Fortunately, Maria can speak English as well as Spanish.
4. He made me explain the results obtained.
5. The engineers plan to develop a new device.

6. The inspectors forced the workers to stop the production line.
7. The teacher let him consult the dictionary.
8. The applicants for this job must have high qualification and experience.

Task 1.16. Make up sentences using the essential vocabulary and the verbs given below to test which of the patterns in task 1.15 can follow them. Then write *a*, *b*, *c*, or *d* beside each verb, look at the list of patterns in the Appendix and check your answers.

must	hope	want	help	let	need
make	ask	agree	tell	invite	force

SECTION IV. DEVELOPING SPEAKING SKILLS

Task 1.17. Read the letter and give some pieces of advice to Irene, her boss and her colleague, using the following phrases:

I think you should / shouldn't ...

If I were you, I would ...

I think you'd better ...

I (strongly) advise you (not) to ...

You must / needn't ...

Why don't you ...

Dear Cat,

I'm so sorry that I haven't written to you since I got the new job. In the beginning it was a nightmare and I really had no time to spare. But let me write about everything in proper succession and you'll be able to make your own judgment. Three months ago I met an acquaintance of mine who had a small business of his own. He was looking for a secretary. I applied for the job and was employed immediately. I have always thought that one needn't have any experience or special qualification to work as a secretary: one just should be sociable and industrious. And I was absolutely right. Though, when I first entered the office, I was greatly surprised: there were several chairs, a big polished table, two desks with computers, a printer, a telephone, a bookcase, a safe and some bright posters on the walls. "I can see no typewriter! And where are business papers?", I asked my boss. "In the computers", he answered. It took me an hour or so to persuade him that computer is a potentially dangerous thing infested with viruses, hackers and non-ionizing electromagnetic radiation. So, he bought a typewriter, a lot of paper, folders, two extra bookcases, and allowed me to store documents and conduct correspondence in an old-fashioned but reliable way. I typed all documents and letters at least in two copies: top copies

for us and carbon copies for our customers. However, some customers began to complain that carbons were difficult to read and contained mistakes. Customers are always hard to please, you know. But I was doing my best and soon bookcases were choked up with files and documents were stockpiled on the desks and on the floor under the big polished table. Quite often it took me hours to find some document. No wonder that I felt tired and overworked. So, my boss had to employ an extra secretary. She is a real beauty: a tall blonde with blue eyes. Unfortunately, she cannot type as it could damage her long manicured nails. But she is very inventive. For example, she suggested buying an electric kettle and having lunch right in the office. It's very convenient and saves time though documents get occasionally smeared with butter or coffee and the kettle leaves white spots on the polished surface of the big table. Whatever they say about blondes, ours is clever with computers: she often plays computer games or chats with strangers in the Internet. It increases expenses of the firm, of course, but, on the other hand, what are those computers in the office for? And my colleague is so communicative. If she isn't busy operating the computer, she is talking with her numerous friends over the telephone so it is a little bit difficult for customers to get through. However, it doesn't matter much because recently we have lost most of our customers. There is such a fierce competition in the market nowadays, you know.

P.S. My boss has just told me that if nothing changes, he'll go bankrupt. Who could have thought about it! His business seemed to be so prosperous three months ago. I'd like to help him. Could you advise something? But just in case, darling, let me know if there is some solid company in your city which needs an experienced secretary or two. I'm looking forward to hearing from you.

Yours sincerely,

Irene.

Task 1.18. Divide into groups (not more than 4 students in each). Pooling resources try to understand the following text. Choose any 5 of the traits mentioned and discuss them in your group. Who of you possesses them in this or that degree? One member of the group should make notes of the discussion; choose the person who will speak on behalf of the whole group during the general discussion using the notes done. Other members of the group should be ready to add anything they think appropriate. The time given for the discussions in groups is 15–20 minutes.

Sixteen traits recruiters seek in job prospects are as follows :

1. **Ability to communicate.** Do you have the ability to organize your thoughts and ideas effectively? Can you express them clearly when speaking and writing? Can you present your ideas to others in a persuasive way?
2. **Intelligence.** Do you have the ability to understand the job assignment? Learn the details of operation? Contribute original ideas to your work?
3. **Self-confidence.** Do you demonstrate a sense of maturity that enables you to deal positively and effectively with situations and people?

4. **Willingness to accept responsibility.** Are you someone who recognizes what needs to be done and is willing to do it?
5. **Initiative.** Do you have the ability to identify the purpose for work and to take action?
6. **Leadership.** Can you guide and direct others to obtain the recognized objectives?
7. **Energy level.** Do you demonstrate a forcefulness and capacity to make things move ahead? Can you maintain your work effort at an above-average rate?
8. **Imagination.** Can you confront and deal with problems that may not have standard solutions?
9. **Flexibility.** Are you capable of changing and being receptive to new situations and ideas?
10. **Interpersonal skills.** Can you bring out the best efforts of individuals so they become effective, enthusiastic members of a team?
11. **Self-knowledge.** Can you realistically assess your own capabilities? See yourself as others see you? Clearly recognize your strengths and weaknesses?
12. **Ability to handle conflict.** Can you successfully contend with stress situations and antagonism?
13. **Competitiveness.** Do you have the capacity to compete with others and the willingness to be measured by your performance in relation to that of others?
14. **Goal achievement.** Do you have the ability to identify and work toward specific goals? Do such goals challenge your abilities?
15. **Vocational skills.** Do you possess the positive combination of education and skills required for the position you are seeking?
16. **Direction.** Have you defined your basic personal needs? Have you determined what type of position will satisfy your knowledge, skills and goals?

Adapted from "Understanding Business" by Williams G. Nickels.

Task 1.19. Discuss these topics, working in small teams:

1. Jobs in engineering.
2. Job which you would like to do in future.
3. Attractions and disadvantages of the engineering profession.

Task 1.20. Read the following dialogues. Memorize their content and reproduce them from memory:

Dialogue 1:

- A: – I'd like to have a word with you.
- B: – What's the matter?
- A: – I've chosen my future speciality.
- B: – At last. What institute are you going to enter?
- A: – Lviv Polytechnic.
- B: – That's interesting! What department?
- A: – I'm going to become an electrical engineer.

B: – Why an electrical engineer?

A: – Oh, electrical power engineering is an extremely broad professional field. It involves generation, consumption and distribution of electrical energy and deals with different kinds of fuel: coal, gas, oil, nuclear fuel, thermonuclear sources of energy and so on.

B: – I'm glad you've made your choice.

Dialogue 2:

C: – I wonder what subjects shall we study this year?

D: – As far as I know, we shall have a lot of special subjects, such as high voltage technique, protective relay and others.

C: – How shall we manage this?

D: – Oh, don't worry! If you know physics, mathematics, theoretical and applied mechanics, you'll easily cope with the task.

C: – Yes, no doubt whatever. But what about English? I've heard it's an optional course this year!

D: – What a pity! We must read plenty of original literature in our speciality to keep pace with time.

C: – I'd rather have our regular lessons.

D: – So would I.

Task 1.21. According to the patterns in the dialogues given above ask your friend:

1. – why he has chosen this speciality;
2. – what his favourite special subject is and why;
3. – what problems are solved by specialists of the speciality he has chosen.

Task 1.22. Compose short dialogues based on the text “The Engineering Profession”.

Task 1.23. Make a three-minute speech on the following topics:

- a. Professional qualities of a good specialist;
- b. Your future speciality. What has influenced your choice;
- c. The most important subjects for a would-be specialist;
- d. Importance of knowledge of foreign languages for an engineer.

Remember that your speech should consist of three sections:

- Introduction: attracting listeners' attention, welcoming the audience, introducing yourself.
- Giving information and opinions: listing advantages and disadvantages, pros and cons, positive and negative points, acknowledging different points of view, asserting an opinion supported by evidence / examples.

- Conclusion: summing up, offering to answer questions, thanking people for listening.

Task 1.24. Speak about the main duties of an engineer using the following expressions:

1. to have advanced experience.
2. to cope with main/primary tasks, to manage with
3. to use advanced methods
4. to be keen on
5. to be right person for the job
6. to display (show) common sense
7. to keep (bear) in mind
8. to know the staff like the palm of your hand
9. to keep pace with the time
10. to have a clear view of
11. to bear responsibility for
12. to monitor the performance
13. to co-ordinate the work of the staff
14. to establish (have, maintain) public relations
15. to solve problems.

Task 1.25. Study the following advertisements and answer the questions below.

1. What companies are advertising?
2. What are the jobs proposed?
3. What professional level of the specialists is needed?
4. What practical experience is required?
5. In what areas is experience sought?
6. What personal qualities and skills are desirable?
7. List the areas in which knowledge of foreign language is obligatory.
8. What is a C.V.?

Marketing and Communications Professional

£16,500

Severn Trent Water Limited is a water and sewage utility serving over eight million people across the heart of Britain with an annual turnover of almost £1,500 million.

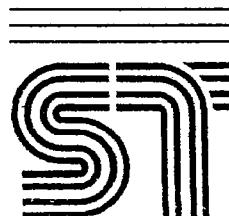
An opportunity has arisen for an enthusiastic communications all-rounder to join our busy in-house Marketing department. We need someone who knows how to drive a Mac (Quark); but with the drive and outgoing nature to liaise with external suppliers, advise and work on behalf of internal departments, and make a positive contribution to our marketing servisec team.

A full driving licence is essential and the ideal candidate will be educated to degree level with at least two or three years' experience in a busy client-side environment.

The post will be based in Birmingham and will enjoy the benefits of employment at a large, successful company. Severn Trent Water operates a no-smoking policy and is an equal opportunities employer.

Please send your CV to Rukhsana Begum,
Marketing Department, Severn Trent
Water, 2297 Coventry Road, Sheldon,
Birmingham B26 3PU. Please quote
reference number 295.

SEVERN TRENT IS AN EQUAL OPPORTUNITY EMPLOYER AND
OPERATES A NO SMOKING POLICY



LANGUAGE SCHOOL SECRETARIAL POSITION

English language school requires capable secretary to help reservations, telephone enquiries, travel bookings, dealing with European offices and general administration.

Must have a good working knowledge of French (and possibly German).

Starting salary of £17,000 p.a. + bonus/

Please send or fax C.V. to

Charles Gray, Piccadilly Group 44 Ebury Street, London SW1W 0LU
Fax: 0171 730 1033



TRAINEE/ACCOUNT EXECUTIVES

Salary commensurate with experience

The Telegraph Colour Library is a major supplier of stock photography to the advertising, media, and design industries. We are looking for candidates to fill positions in our busy sales teams.

You should be an ambitious and self-motivated person with excellent communication skills and an ability to work under pressure. The successful candidate must be professional, and well organised. Sales or account handling experience within the design, advertising or business to business industries would be advantageous although full training will be given.

If you feel that you have the qualities to fulfil the above criteria and wish to join a fast growing and progressive company, please forward your CV indicating your present salary and including a daytime telephone number to Nicki Kelland,

Personnel Manager, at the address below.

No calls or agencies please. Closing date 07/11/97.

Innovation Centre, 225 Marsh Wall, London E14 9FX

A DIVISION OF VISUAL COMMUNICATIONS GROUP

Task 1.26. Now select the job for which you could apply and answer the following questions:

1. What company would you like to work for?
2. What educational background is needed?
3. In what country (city, area, district) will you work?
4. How long will the working day last?
5. What salary is proposed?
6. Is knowledge of a foreign language important?
7. What information about yourself must you send to the employer?

SECTION V. READING AND WRITING

Task 1.27. Read the text and discuss it with your fellow students:

ENGINEERING PROFESSION

Engineering is a science of applying knowledge of properties of matter and natural sources of the energy to practical problems of industry. It deals with different things: design and manufacture of tools and machines, cars and trains, equipment for communication and computing, generation and distribution of electricity, X-ray machines and life-support systems, roads and bridges, building of houses and all the services we need in our homes, at work and in many other places. This occupation is very ancient. The first toolmaker who managed to do a wheel, the craftsmen who built Egyptian pyramids were the forerunners of modern engineers. But until the nineteenth century all those generally were craftsmen or project organisers, who learned their skills through apprenticeship, or trial and error. As a result of the Industrial Revolution and great increase in scientific knowledge, engineering has grown into a profession of higher level. A profession is one of a limited number of occupations or vocations involving special learning and carrying a certain social prestige.

Nowadays such occupations like law, medicine or engineering require specialised advanced education. Many people spend years studying at universities to gain these professions. One of such universities which offers an extensive range of opportunities for those who want to gain the engineering profession is "Lviv Polytechnic" National University. It is a modern educational, scientific, technical and cultural centre in Western Ukraine which is entering the European and world scene of scientific integration. Curriculum programs at the University are realised at 13 Institutes training students for their professional careers.

The programs have been based on experience of the best universities and institutes of technology of the world. According to them, not only Specialists but Bachelors and Masters are trained here. A Bachelor's degree requires four years, a Specialist's degree five years and a Master's degree requires a further year of studying.

The University students undergo a continual process of education, and study a lot of different subjects. In the first two years mathematics, physics, chemistry, history, foreign languages and other general subjects are emphasised throughout the curriculum. Mathematics is very important not only for the future engineers but also for economists, managers, social workers, so it is paid much attention to. Because computers and automation have already changed the way we work and what we do, and are now changing the world in which we work, and because there is hardly a branch of engineering which can do without computers, computer programming is now included in almost all engineering curricula. As the systems that engineers produce must be workable not only from a technical but also from an economic and social points of view, a current trend is to require students to take courses in social sciences, economics and languages. Engineers must accommodate their ideas to the financial realities of a project, they must have a good command of language to be able to prepare reports or to sum up their findings for scientific publications.

Those who are doing scientific research must be able to read foreign publications in their subject areas. The aim of the last two years of studying is to equip the students with skills and knowledge within their field of specialisation. For example, the curricula for students of the Economics and Management Institute include the following disciplines: marketing, personnel management, human resource management, business administration and others; students of the Institute of Theoretical Mechanics and Transport study theoretical mechanics, strength of materials, computer aided design, etc.

All University specialised courses and research programmes are designed to provide the highest quality, up-to-date training and experience possible. Employment opportunities exist in different spheres. Professional engineers, trained at the University may work as design engineers, creating new products, products installation engineers installing the new equipment, or production engineers ensuring the efficient production process. Some engineers may also work as sale engineers, and those concerned with electrical grids, power stations, automobiles and other machines may work as maintenance engineers. Graduates of the Institute of Economics and Management find employment in management, and specialists in architecture and arts can work in architectural or construction companies.

In other words, specialists in engineering may work almost in all spheres of industry and social life, and their profession is not only very old, but it is one of the up-to-date occupations as well.

Task 1.28. Study the letter of application for employment, and answer the questions given below it:

400 Haggerty Road
San Francisco, CA 94105

May 16, 2002

Mr. John Moot
Finson (UK) LTD
103-105 Crawford Street
London W 1H1AN

Dear Mr. Moot,

I am writing because of your advertisement in the Sunday issue of *The Guardian*. I want to apply for a product manager in your company. My work experience as information systems manager in Bromley College and my work in the USA should be of value to the project. My credentials include:

Employment as information systems manager in Bromley college (UK) for 2 years. (Ref. Ph. Dennell, Technical Group Supervisor)

Employment as multimedia programmer with Human Resources Department in San Francisco (USA). I was responsible for maintaining and developing the physical resources required to produce multimedia learning materials as well as developing and maintaining the Internet / Intranet sites.

My future goals include desire to advance in the area of technical management in Great Britain. If this is possible. I can be reached at tel. 123-456 during the afternoon and evening.

Sincerely,

Ian Bennett

Questions:

1. Where does the applicant live?
2. What company would he like to work for?
3. How did he learn about the vacancy?
4. What post would he like to hold in the company?
5. Where did the applicant work before?
6. Does the letter contain any information about the educational background of the applicant?

Task 1.29. Write a letter of application for one of the posts advertised in Task 24.

You need to know that:

- the letter usually is only one page long and has four main sections:

- a. the heading, including the writer's address, the reader's address, the date;
- b. the paragraph which introduces you and your reason for writing;
- c. the paragraph which gives the most relevant information about your experiences;
- d. a closing paragraph asking for an interview, providing your telephone number, hours you may be reached or other data.

Task 1.30. Read the given instructions how to write a resume and compile a resume of your own:

RESUME

A resume is a written summary of your personal, educational and professional qualifications. It should appeal to the employer and tell what you can do for him/her. The content of any resume is supposed to be detailed enough, but brief (usually not exceeding one-two pages in length).

Parts of a resume :

Heading: Place your name and contact information at the top.

Objective: write a short (1-2 sentence) summary about your professional goals as it relates to the job.

Education: Include school and university names, dates of attendance and grades (if they are very high). Describe your major fields and how they relate to the job you are seeking.

Work experience: Indicate type of job, employer, location, dates of employment. Describe your duties and point out leadership roles and qualifications.

Languages and other skills: Communication skills, computer literacy etc. are especially important to most employers.

Personal: Indicate your hobbies and kinds of leisure activities you are interested in and your mobility (readiness to go on business trips).

Here are some additional hints for writing a proper resume. Any resume is desirable to be typed on a good quality original paper. When writing a resume don't use narrative form. Make section divisions clear and highlight the most important aspects first.

Task 1.31. Read the text and find answers to the questions given below:

WORKING IN THE PATENT INDUSTRY

Patents are considered to be a barometer of a country's economic prosperity, as most technological developments are intended to make life better – be it through increased profits, reduced pollution or improved medical instruments. Though there are still inventions concerned with killing people and destroying their environment.

The earliest-known patent was granted in 1449 for a method of making stained glass (кольорове/ вітражне скло). In recent years there has been a sudden rush of patent applications in genetic engineering and anti-theft (security) devices. Patents provide inventors with a monopoly to make, use or sell their new product or manufacturing process.

Working with patents means that you are at the leading edge of technology and see what is going to be on the market in a few years. You have to deal with fantastic ideas and eccentric people. So the job requires patient and highly-qualified specialists. In the patent industry you may work either as a patent agent (агент/посередник патентознавець) or a patent examiner (обстежувач патентознавець). Patent agents are employed by inventors to guide them through the patent registration. But drafting patent applications is only one aspect of the agent's job. He or she also advises companies on all areas of intellectual property including trademarks, design rights and copyright. The agent does his best to obtain as wide a monopoly as is commercially justified.

Patent examiners are employed by the Government-run Patent Office. Their function is to make sure whether the invention is really new and the application is legal and technically sound (технічно правильний). Besides, they try, in the public interest, to limit the inventor's monopoly. This monopoly has to be expressed in words, i.e. in the form of a report (specification) prepared by the inventor or his patent agent. The examiner must read the description and imagine what the monopoly could possibly cover. To help in the assessment, the examiner has to look through a lot of documents and a huge computer database concerning past patent applications to see whether there is anything similar to the invention he or she is dealing with. Then the examiner must send a report on her/his findings to the inventor or the inventor's patent agent. The patent examiner must be a good detective and have a profound knowledge of the law.

Both agents and examiners should have higher education in the field of science and engineering and they need similar qualities: an analytical mind and ability to write clearly. They need to be precise and well-organized because everything depends on detail. Knowledge of at least one foreign language is an advantage. Examiners are trained mainly on-the-job (в процесі роботи), while agents face several years of exams before they qualify. However, this hard work is adequately rewarded: patent agents working in private practice usually earn about twice as much as agents working for a company and much more than government-employed examiners.

Adapted from The Guardian.

Questions:

1. What is the purpose of most technological developments?
2. When was the earliest-known patent registered?
3. What rights does a patent provide an inventor with?
4. Whom are patent agents employed by?
5. What do patent agents do?
6. Where do patent examiners work?
7. What do patent examiners do?
8. What abilities should people working in the patent industry have?
9. How are examiners trained?
10. What should one do in order to qualify as a patent agent?
11. Which category of employees working in the patent industry is the most highly-paid one?

Task 1.32. Read the application letter and talk about the applicant:

31 North Road
London WE685

21st September 20__

Box # 1513
The Times
London EC 437

Dear Sirs,

With reference to your advertisement in the September 20 issue of *The Times*, I should like you to consider me for a position as a department secretary.

I believe that I have the skills you are looking for, as I graduated from Chapel Secretarial College five years ago. I am well qualified in shorthand and typing. In addition to having previous experience in all kinds of office work, I am familiar with personnel management and have a fairly good command of French and Spanish.

I would be grateful if you could discuss my qualifications for beginning a career with your organisation. I am free to visit your office for an interview at any time convenient for you. Please phone me any afternoon between 3 and 7 p.m. at 919-2613 to let me know the day and time.

I look forward to hearing from you in the nearest future.

Yours faithfully,

Ann Palmer (Mrs)

Enclosure

Now complete the sentences using suggested words and translate them into Ukrainian:

1. **With reference to** (Посилюючись на...) ..., **I should like** ... a) your advertisement for a sales manager; b) your invitation; c) your letter of 5 December; you to accept my apologies for keeping you waiting for the information.
2. **I would like to apply for** ... a) the position as a sales representative; b) the participation in the conference; c) a place at the university.
3. **I believe that I have the skills you are looking for as** ... , **as I** ... a) an administrative assistant; recently I have completed the course in business administration; b) a software engineer; I have gained the Master's degree in computer sciences; c) a trainee technician; am studing at Lviv Polytechnic.
4. **In addition to having previous experience in** ... , **I am familiar with** ... a) composing different types of documents; the computer system you use in your office;

- b) operating a computer; compiling programs; c) installation of equipment; maintenance and repair work.
5. **I would be grateful if you could ...** a) grant smb an interview; b) send smb an application form; c) ring smb up and fix the date of the meeting; d) give smb further information about the salary and working conditions.
6. **I am free ... at any time convenient for you.** a) to visit smb's office for an interview; b) to ring smb up; c) to meet smb.
7. **I look forward to ...** a) hearing from smb in the nearest future; b) meeting smb; c) calling smb.

SECTION 6. INSTITUTE OF APPLIED MATHEMATICS AND FUNDAMENTAL SCIENCES

Task 1.33. Discuss the following questions in small teams, write down the most interesting ideas and present them to the whole group after the discussion:

1. Do you agree or disagree with the following statement: a mathematician should have two main qualities: sober mind and scientific imagination (creative thinking).
2. You want to persuade someone to study mathematics. What reasons would you give? (Support your answer with specific details and examples).
3. Which do you prefer: algebra or geometry? Why?
4. Choose one of the following careers and explain why it is important to society: mathematician; computer programmer; farmer; doctor; lawyer.
5. Your institute has enough money to purchase either computers for students or books on mathematics for the library. Which would you recommend – computers or books? Use specific examples and arguments to support your opinion.

Task 1.34. Practice pronunciation of the vocabulary and translate the sentences containing it:

1. **achieve** – досягти – finish, accomplish, perform successfully,
e.g. We've achieved what we set out to do.
achievement (**n**) – досягнення – something accomplished.
e.g. In the Internet you may find the information about the latest achievements in any field of science.
2. **additional** (**adj**) – додатковий – apart from smth already present. *syn: extra, supplementary,*
e.g. Qualification in social informatics requires additional training.

3. **advanced (adj)** – сучасний, досконалий – latest, more complex, improved in rank and value,
e.g. Much training is needed in order to possess advanced technical skills.
4. **anticipate (v)** – а) передбачати, передчувати – to have the previous view or impression of, to foresee smth.,
e.g. Pythagoras anticipated modern discoveries of mathematical relationships within all things.
 б) – очікувати – to look forward to smth/doing smth.,
e.g. I anticipate the oncoming conference.
anticipation (n) – передбачення, сподівання – previous view or impression of what is to happen, instinctive preview, looking forward to smth.,
e.g. We await the edition of the next volume of this encyclopaedia with keen anticipation.
5. **approach (n)** – підхід – a special way of dealing with or thinking about task, problem or situation,
e.g. There were several possible approaches to solution of this problem.
6. **arrange (v)** – а) домовлятись, узгоджувати – to fix or make practical plans for smth to happen or to be done,
e.g. We've arranged to meet near the department of physics.
 б) приводити до ладу, впорядковувати) to put in proper order,
e.g. He started to arrange the book in files.
arrangement (n) – впорядкування, приготування – act of putting in an orderly condition, the state of being put in order,
e.g. The staff is working frantically on final arrangements for the summit.
7. **assume (v)** – а) припускати - to take as a fact; *syn. to suppose, to presume*
e.g. It is a misconception to assume that two continents are similar.
 б) брати на себе - to undertake; take to or upon oneself,
e.g. He assumed all the responsibility for the incident.
assumption (n) – припущення – the thing supposed, a postulate; *syn. supposition*
e.g. Professor questioned the scientific assumption on which the global warming theory is based.
8. **circumscribe (v)** – обводити, оточувати – to enclose within a certain limit *syn. to limit, restrict; to surround,*
e.g. He draw a triangle and then circumscribed it with a bold line.
9. **compile (v)** – укладати – to put together in a new form out of materials already existing,
e.g. It took him 8 years to compile the book.
compilation (n) – укладання - act or process of compiling or gathering together from various sources,
e.g. There have been enormous advances in the compilation of data.
10. **consider (v)** – вважати, розглядати. – to think, have the opinion of smb, smth.,
e.g. Mathematics is considered to be both the queen of sciences and the handyman working for them.

- considerable (adj)** – вагомий, значний – great in amount or degree; *syn. substantial,*
e.g. A considerable progress is known to have been made in this field of science during the twentieth century.
- 11. curriculum (n) (pl curricula)** –навчальна програма - all the different courses of study that are taught at the university,
e.g. All subjects offered by the university's curricula are obligatory.
- 12. declination (n)** – a) магнітне схилення – the angular distance of any object from the celestial equator, either northward or southward.
e.g. Astrolabe was the device that measured the declination of heavenly bodies above the horizon.
 b) – відхилення – act of deviating or turning aside, oblique motion; *syn. deviation, obliquity, withdrawal,*
e.g. He noticed the declination of the needle of the compass.
- 13. determine (v)** – визначити – decide, settle, discover as a result of investigation,
e.g. My aim was first of all to determine what I should do next.
determination (n) - визначення, встановлення – firm or resolute conduct or purpose,
e.g. We must take in to our own hands the determination of our future.
- 14. direction (n)** – напрям – the general way in which smth. develops or progresses,
e.g. He's never done any sustained writing and that might be one of his next directions.
- 15. discover (v)** – відкривати, віднаходити – to show or make known smth. that has been secret, unseen or unknown,
e.g. They discovered how to form the image in a thin layer on the surface.
discovery (n) – відкриття – a thing found out or for the first time ascertained or recognised,
e.g. Cloning is one of the most curious modern discoveries.
- 16. distinction (n)** – розрізнення - act of distinguishing or denoting the differences between objects or qualities,
e.g. There are obvious distinctions between different branches of mathematics.
distinct (adj) – різний, інший -*syn different, individual, distinctive,*
e.g. Engineering and technology are the disciplines distinct from one another and from science.
- 17. enterprise (n)** – підприємство – a company or business, often a small one,
e.g. Students take their practical training at planning departments of industrial enterprises.
- 18. essential (adj)** – суттєвий, головний – important in the highest degree; *syn. indispensable, necessary,*
e.g. You must be able to find the most essential information in technical texts.
- 19. forecast (v)** – передбачати, прогнозувати – to say what is going to happen in the future. *syn foresee,*
e.g. The students should master forecasting of events in the field of international relations.

20. **fundamentals(n)** – основи – basics, the simplest and most important ideas and principles of science in contrast to more complicated or detailed ones,
e.g. Besides many technical subjects the students should master fundamentals of the humanities.
21. **introduce (v)** – впроваджувати – to cause smth. to enter a place or exist in a system for the first time,
e.g. At our institute the three-level training of specialists has been introduced.
introduction (n) – впровадження – act of introducing, bringing to notion,
e.g. New technologies should be tested before their introduction into the production process.
- introductory (adj)** – вступний, ввідний – giving general information about smth often before a more detailed information,
e.g. The students are expected to master an introductory course of religion and theology.
22. **irrevocable (adj)** – безповоротний, остаточний – incapable of being recalled or revoked.; *syn unchangeable, unalterable, irreversible,*
e.g. He made an irrevocable decision and there was no use arguing any more.
23. **master (v)** – опановувати – to succeed in understanding smth. completely,
e.g. He soon mastered the skills of radio production.
24. **obligatory(adj)** – обов'язковий – required, binding *syn. Compulsory,*
e.g. Almost all the subjects offered by the university's curricula are obligatory.
25. **obtain (v)** – отримати – to get, *syn.: receive, gain,*
e.g. Having obtained profound knowledge in his major, he was able to find a very good job after graduation from the university.
26. **obvious (adj)** – очевидний – easily discovered, seen or understood *syn evident, apparent, conspicuous,*
e.g. It may be stating the obvious but most of teleworking at present is connected with computers.
27. **perceive (v)** – збагнути, помітити, усвідомити – to identify and obtain knowledge by means of the senses; *syn to apprehend,*
e.g. Every student should perceive for himself the direct relationship between success and effort
28. **profound (adj)** – глибокий – having or showing great knowledge in subject,
e.g. They have acquired profound knowledge in all the branches of mathematics.
29. **record (v)** – записувати – to write down an information or put it into computer so that in the future people can refer to it,
e.g. The results of the carried out experiments were recorded into the students' notes.
record (n) – запис – written account of smth.,
e.g. Those who gain the additional speciality of a teacher have a proper record in their diplomas.
30. **revolve (v)** – обертатись – to move in a curved path around a center *syn to rotate,*
e.g. The planets revolve around the Sun. (lit.)
e.g. The conversation revolved around the recent conference.(fig)

31. **solve** (v) – вирішити – to find an answer to a problem or question. *syn. to resolve,*
e.g. The students are taught to solve various mathematical problems.
- solution** (n) – рішення – dealing with a problem or situation in such way that difficulty is removed,
e.g. No matter how hard he tried he failed to find the solution to the problem under consideration.
32. **up-to-date** (adj) – сучасний – *syn modern, contemporary,*
e.g. Training at the university is conducted on the basis of the most up-to-date computer facilities and information technologies.
33. **undermine** (v) – підривати, похитнути – to ruin, remove the foundation or support of
e.g. Descartes irrevocably undermined many traditional assumptions.

Task 1.35. Arrange the following words in groups of two or more synonyms:

a) adjectives and nouns:

deviation, apparent, indispensable, additional, assumption, necessary, up-to-date, distinct, fundamentals, conspicuous, supposition, declination, unchangeable, obvious, obligatory, irrevocable, modern, supplementary, unalterable, substantial, compulsory, irreversible, contemporary, considerable, extra, different, basics, obliquity, essential, evident, required.

b) verbs:

assume, ruin, apprehend, surround, suppose, anticipate, accomplish, foresee, revolve, achieve, undermine, resolve, perceive, limit, rotate, presume, forecast.

Task 1.36. Translate the following expressions into Ukrainian and use them in sentences of your own.

1. to assume responsibility/control;
2. to undermine someone's reputation;
3. outstanding /remarkable achievement;
4. the most advanced scientific methods;
5. to a considerable extent;
6. a considerable amount of time;
7. to follow directions;
9. to give/issue directions;
10. essential difference;
11. irrevocable mistake;
13. irrevocable decision;
14. irrevocable past;
15. obvious reason;
16. profound changes;
17. profound effect;

Task 1.37. Read the text and present its contents in the form of an interview:

INSTITUTE OF APPLIED MATHEMATICS AND FUNDAMENTAL SCIENCES

Paying more attention to the subjects determining the main directions of progress of mankind – mathematics, physics, chemistry, informatics and others – is considered a priority in the development of Ukrainian education in the 21st century. Modern applied

tasks arising in different branches of science and engineering mostly have a non-linear character. It's not always possible to solve them using traditional approaches, that's why new methods and modern information technologies are required. A considerable part in this activity belongs to the Institute of Applied Mathematics and Fundamental Sciences, an educational and scientific unit of Lviv Polytechnic National University.

The former Faculty of Applied Mathematics is known to have been separated from the Faculty of Electro-Physics in 1993. And in 2001 it was designated as the Institute of Applied Mathematics and Fundamental Sciences. Those applicants who entered the Institute get an opportunity to major in almost all branches of mathematics as they are obligatory subjects in this specialization. The director's office and specialized departments are housed in academic building № 4. The Institute comprises three specialized departments. These are: the Department of Applied Mathematics, the Department of Computational Mathematics and Programming, the Department of Higher Mathematics. Three-level training of specialists corresponding to educational-qualifying degrees of Bachelor, Specialist and Master has been introduced at the institute. Students gain a Bachelor's degree after four years of study. It enables them to continue their studies (for a year and a half) and gain a Specialist's degree. The students studying for a Master's degree obtain profound knowledge in special subjects during two years. Training is conducted on the basis of the most up-to-date computer facilities and information technologies. The Institute has at its disposal 6 computer study-rooms, i.e. local area networks. Being connected to the Internet they provide students with the latest information about the achievements in their field of science. They take their practical training at research institutes, at planning departments of industrial enterprises, in banks and other financial institutions. The ablest undergraduates are actively involved into research work. Graduates of the Institute can get qualification in such subject areas as applied mathematics, social informatics, international information, applied physics.

Applied mathematics. All subjects are grouped into 3 academic blocks comprising *humanitarian and socio-economic disciplines*: the Ukrainian language, foreign language, Ukrainian and foreign culture, history of Ukraine, fundamentals of Constitutional law of Ukraine, religion studies, philosophy, fundamentals of ecology, sociology, political science and others; *fundamental disciplines*: algebra and geometry, mathematical analysis, programming, physics, theory of complex variable function, functional analysis, discrete mathematics, differential equations, equations of mathematical physics, theoretical mechanics; *specialist-oriented disciplines*: computer software, metrology, standardization, certification and accreditation, methods of optimization, system programming, databases and information systems, computer networks, visual programming, data analysis, computer graphics, methods of information security etc. Having advanced knowledge in their special fields, future graduates may work for research institutes, design bureaus, industrial enterprises of different forms of ownership, planning departments, administrative and educational establishments. Having the desire, you can get an additional specialty – a teacher of physics and informatics with a proper record in the diploma.

Social informatics. Qualification in social informatics requires additional training including the study of the following subjects: design of social processes, actuarial

mathematics, mathematical design and research of risk in banking and insurance business, choice and decision-making theory, forecasting of social processes and game theory. Possible places of work are research and educational establishments, carrying out academic and research activity in the branch of social informatics, informative and bank subdivision, insurance companies, industrial and trade enterprises of different forms of ownership.

International information. The training of future specialists in this field foresees preparation in the field of international relations, informational- and analytical sphere, linguistic competence and competence in the branch of computer technologies. A student should master abilities and skills of the use of modern methods of analysis and forecasting of events in the field of international relations, optimum decision-making, development of recommendations as to further policy of the state, region etc. Experts in this field may be employed by ministries, news agencies, broadcasting companies, representative offices of the President, the Ministry of Labour and Social Policy, scientific and educational establishments carrying out experimental work in the field of modern information systems and computer technologies, political science, sociology, economy, history and law. Entrance exams are to be taken in mathematics, foreign (English, German or French) and the Ukrainian languages.

Applied physics. The modern applied physics is the foundation of new technologies. Nanophysics, one of the most prospective branches, is being actively developed nowadays, paving the way for new scientific inventions and developments of nanotechnologies, the nearest future for all branches of electronics, material studies, medicine, communication means. The content of curricula foresees not only humanitarian, social and economic training, but also profound competence in fundamental and specialist-oriented disciplines. Having gained the Bachelor's degree, students have to choose one of the specializations: computer physics or physical problems of energy saving. Computer physics has arisen as a combination of three disciplines: physics, mathematics and computer science. It has already firmly established itself as an important and independent branch of physics. Its tasks are development of algorithms and software, computer design of physical processes and phenomena, computational solving of non-linear tasks of physics.

Being a graduate of the Institute of Applied Mathematics and Fundamental Sciences, you won't have problems with future employment as all the curricula meet world requirements. The diploma awarded to you will greatly improve your professional status on the labour market.

Task 1.38. Find the Subjective Infinitive Complex (Complex Subject) and translate the sentences.

1. The experiment was considered to be reasonable.
2. This algebraic equation is supposed to have two roots.
3. The function is expected to be calculated by means of the number series.
4. The obtained results have proved to confirm this hypothesis.
5. This condition is assumed to be necessary and sufficient for the existence of non-linear

integral equation solution. 6. The new method is regarded to be applicable to this type of mathematical analysis problems. 7. The assumption turned out to be true. 8. Euler's method is recommended to be used for solution of homogeneous linear equations of the first order. 9. They are reported to suggest quite a new approach to the solution of this problem. 10. Newton is known to have been the founder of classical mechanics. 11. This mathematician's work is expected to have both theoretical and practical value.

Task 1.39. Fill in the blanks in the Complex Subject constructions with proper verbal forms:

1. Our institute is said ____ in the year 2001.
a) to rename; b) to be renaming; c) to have been renamed.
2. I am sure ____ both in applied mathematics and physics while I am studying for the Master's degree.
a) to major; b) to have majored; c) to have been majoring.
3. They are expected ____ more attention to the study of computer graphics next year.
a) to be paid; b) to pay; c) to have paid.
4. This professor is known ____ at the Department of Applied Mathematics for 30 years before he retired. a) to have been working; b) to work; c) to be working.
5. The institute is reported ____ some new technologies in the field of nanophysics at present.
a) to be developed; b) to have been developed; c) to be developing.
6. This scientist was supposed ____ this problem, using some non-traditional approach.
a) to be solved; b) to have been solved; c) to have solved.
7. She seems ____ by an insurance company.
a) to employ; b) to have been employed; c) to be employing.
8. They happened ____ this phenomenon at the same time.
a) to be investigating; b) to be investigated; c) to have been investigated.
9. These computers are likely ____ with new ones in the nearest future.
a) to replace; b) to have replaced; c) to be replaced.

Task 1.40. Fill in the blanks in the Complex Object constructions with proper verbal forms:

1. I know her ____ the entrance exam in English last year.
a) fail; b) to have failed; c) to fail.
2. The teacher expected us ____ calculations as soon as possible.
a) to do; b) to be done; c) to have been done.
3. We think them ____ recommendations concerning the further policy of the state at present.
a) to be developed; b) to have developed; c) to be developing.

4. She supposed the decision ___ yesterday.
 - a) to make; b) to have been made; c) to be making.
5. He wants his computer ___ next week.
 - a) to repair; b) to be repaired; c) to have repaired.
6. They consider him ___ the most outstanding mathematician of Ancient Greece.
 - a) is; b) was; c) to have been.
7. Students watched the lab assistant ___ their calculations.
 - a) check; b) to check; c) to have checked.
8. We heard the professor ___ a lecture on fundamentals of metrology.
 - a) to deliver; b) deliver; c) to be delivered.
9. The head of our Department let me ___ the subject of my course project by myself.
 - a) to choose; b) to be chosen; c) choose.

Task 1.41. Match the definitions with the words given:

1. geometry; 2. algebra; 3. coordinate system; 4. circle; 5. center; 6. axiom; 7. angle;
8. proper fraction; 9. improper fraction; 10. addition.

- a) system of locating points in space by using reference lines or points;
- b) a statement used in the premises of arguments and assumed to be true without proof;
- c) a fraction in which the numerator is less than the denominator;
- d) a mathematical operation performed on two numbers (addends) to give a third (the sum) ;
- e) the branch of mathematics concerned with the properties of space and figures in space;
- f) a fraction in which the numerator is greater than the denominator;
- g) a point about which a geometric configuration is symmetrical;
- h) a configuration of two lines (the sides or arms) meeting at a point (the vertex) ;
- i) the branch of mathematics that deals with the general properties of numbers;
- j) a plane curve that is the locus of a point which moves at a fixed distance (the radius from a fixed point (the center).

Task 1.42. Read the statements and indicate whether they are true or false (if necessary use additional vocabulary).

1. Every quadrilateral is a rectangle.
2. A rhombus is a parallelogram with two adjacent sides equal.
3. The opposite sides of a parallelogram are parallel.
4. Not every rhombus is a square.
5. A right-angled triangle has several right angles.
6. The intersection of a plane and a straight line is a point.
7. Two parallel lines lying in the same plane cross.

8. In non-Euclidean geometry two parallel lines lying in the same plane may intersect.
 9. In non-Euclidean geometry the sum of the angles in a triangle may be more or less than 180 degrees.

Task 1.43. Read the following sentences and write down mathematical problems:

1. z raised to the power 6 plus $4a$ divided by 5 is less than 9.
2. The ninth root out of 109 minus 4 cubed is b squared.
3. a divided by b raised to the power 7 is greater than z squared.
4. x raised to the power 6 plus 4 multiplied by b raised to the power 12 minus square root of m is $2n$.
5. b raised to the 4th minus 5th root out of y divided by a cubed minus b squared.
6. The third root out of z plus x plus 5 squared is greater than 4.
7. x raised to the power n minus 5 cubed is less than a raised to the power 5 plus 4 b .
8. The fifth root out of 88 plus $4a$ divided by (a plus b) cubed is x raised to the power n .
9. a divided by 8 is (b cubed minus ab) raised to the power 5.
10. a minus c divided by x squared plus b raised to the 7th is greater than the forth root out of b squared.

ADDITIONAL VOCABULARY

1.	Adjacent	1.	прилеглий
2.	Arbitrary constant	2.	довільна стала
3.	Elastic	3.	пружний
4.	Equation of the first order	4.	рівняння першого порядку
5.	Euler's method	5.	метод Ейлера
6.	Influence function	6.	функція впливу
7.	Intersection	7.	перетин
8.	Hypotenuse	8.	гіпотенуза
9.	Opposite	9.	протилежний
10.	Plane	10.	площина
11.	Point	11.	точка
12.	Non-Euclidean	12.	(не) евклідова
13.	Non-homogeneous	13.	(не) однорідний
14.	Non-linear	14.	(не) лінійний
15.	Quadrilateral	15.	четирикутник
16.	Parallelogram	16.	паралелограм
17.	Rectangle	17.	прямокутник
18.	Rhombus	18.	ромб
19.	Right (acute, obtuse) angle	19.	прямий (гострий, тупий) кут
20.	Rigidity	20.	жорсткість

21.	Square	21.	квадрат
22.	Straight line	22.	пряма лінія
23.	Triangle	23.	трикутник
24.	Variable distribution	24.	змінний розподіл
25.	Vibration problems	25.	задачі коливань
26.	Vertex	26.	вершина (кута)

SECTION VII. INSTITUTE OF COMPUTER TECHNOLOGIES, AUTOMATION AND METROLOGY

Task 1.44. Read the text and present its content in the form of an interview:

The precursor of the Institute of Computer Technologies, Automation and Metrology – the Faculty of Automation – was separated from the Radio Engineering Faculty in 1962, and in autumn 2001 it was transformed into an institute. Nowadays the Institute comprises five departments, namely: the Information-Measuring Technologies Department (founded in 1920), the Department of Automation and Telemechanics (1945), the Department of Precision Mechanics (Mechatronics) Devices (founded in 1962), the Computer Engineering Department (founded in 1963), and the Department of Metrology, Standardization and Certification (founded in 1995). The Faculty of Automation was renamed the Institute of Computer Technologies, Automation and Metrology in autumn 2001. It trains experts in computerized systems, metrology and measurement, computer engineering, information security, and precision mechanics (mechatronics) devices.

The general direction of the Institute is automation, metrology and information support of production processes, i.e. application of technical means and introduction of control systems that can partly or completely work without any assistance from human workers. The main purpose of automation is to increase labour productivity, to improve the quality of manufactured goods or to relieve people of performing monotonous or dangerous work. Modern plants and factories are equipped with computer-controlled machine-tools, computerized systems inspecting the quality of manufactured goods, data-communication systems, and precision mechanics (mechatronics) devices.

Automation has penetrated into all spheres of human activity, that is why graduates of the Institute are able to find jobs at any manufacturing enterprise. To cope with the tasks facing future specialists in automation, the students should acquire profound knowledge in both general and special subjects. Junior students are instructed in physics, mathematics, descriptive geometry, foreign language and some other subjects. Senior students master special subjects according to the speciality chosen: measurement

of electrical (voltage, frequency, resistance etc.) and non-electrical (temperature, pressure, dimensions etc.) quantities, remote control and telemetering, fundamentals of calculating techniques, programming, fundamentals of communication theory etc.

The students of the Institute are provided with everything they need for their studies. The laboratories and study-rooms are equipped with modern facilities and teaching aids. The students have an opportunity to attend lectures delivered by experienced professors and assistant-profs, conduct their lab experiments, learn how to handle devices under the guidance of experienced teachers, and take industrial training at large enterprises to gain expertise in a specific branch of industry. From the first year of study the students are involved in the research work and are given a chance to take part in seminars and scientific conferences.

The ICTA is one of the leading institutes at Lviv Polytechnic National University. It has established profitable education and research cooperative links with well-known European and North-American technical universities, and takes part in different scientific conferences around the world. Its graduates are highly qualified specialists in automation, telemechanics, metrology, standardization, certification, precision mechanics (mechatronics) devices, data-measuring techniques, computerized systems, computer engineering and information security. Over a hundred students enter this Institute every year to receive up-to-date training, including international students. The best students are involved in the international education exchange programme with Ilmenau Technical University and receive there the German Engineer Diploma. The ICTA also offers postgraduate teaching for those wishing to gain higher degrees. At the Institute there is the Doctor of Science Award Committee responsible for examining dissertations and conferring research degrees in 4 subject areas. The courses are taught by highly qualified staff. There are also engineering researchers who assist in advanced practical training. Lecturing staff and students are actively engaged in research work. The Institute possesses all the necessary facilities to support courses at the undergraduate and postgraduate levels, including well-equipped laboratories occupying a total area of 1200 square meters. The training of specialists meets world standards. Many graduates of the Institute have become academicians, executive directors, chief engineers at manufacturing enterprises, honoured scientists and inventors, winners of state prizes in Ukraine and abroad.

Task 1.45. Before reading the text, match the Ukrainian word combinations with their English equivalents:

- A. 1. потенціометрична установка, 2. державна атестація, 3. перевірка державного еталону, 4. електрорушійна сила, 5. авторське свідоцтво, 6. вимірювальний перетворювач, 7. термоперетворювач опору, 8. переносний прилад, 9. цифровий щитовий прилад, 10. чутливий елемент, 11. серійний широкодіапазонний міст, 12. компенсатор постійного струму, 13. проходити довготривалу переддипломну практику.
- B. a) verification of the state primary standard, b) inventor's certificate, c) portable device, d) thermal converter of resistance, e) production-type wide-range bridge, f) digital switchboard device, g) potentiometric installation, h) dc (direct current)

compensator, i) state certification, j) measuring transducer, k) to take long-term pre-diploma training, l) electromotive force, m) sensor, sensing element.

The Information-Measuring Technologies Department is the oldest at the Institute of Computer Technologies, Automation and Metrology. The course in electrical measurements has been conducted at our higher school since 1892, but this Department (as an independent unit) was separated from the Department of Electrical Machines in 1920. From 1930 till 1941 it was headed by Prof. V. Krukovsky whose practical activity was connected with the work of the famous firm *SIEMENS*. The department is known to have been generously provided with the latest measuring devices produced by the firm, which enabled it to become a scientific metrological centre. In the 1930s the first potentiometric installation for state certification of electric measuring devices was created, and an installation for verification of the state primary standard of electromotive force was also developed here. At that time Assistant-Professor V. Kochan, an outstanding expert in the field of resistance devices and electromotive force, began his half-a-century-long work at the Department.

In 1973 the Department created a metrology group at the student construction bureau under the guidance of Assistant-Professor Y. Shmorgun. In the 1980s the Department equipped its study-rooms with IBM personal computers to intensify the educational and research processes, and introduced computer-aided design systems for the development of measuring devices.

The fruitful research and designing work carried out by the staff and students of the Department has been embodied in numerous inventor's certificates. Most of the inventions have found wide application in industry, among them: production-type wide-range bridges, dc compensators, potentiometers, measuring transducers, sensors for thermal converters of resistance, universal P4833 portable measuring instrumentation, F-566 digital switchboard devices, and many others.

The Department trains experts in metrology and measurement. It has concluded agreements on scientific and educational cooperation with a number of technical higher schools of Germany, Great Britain, Canada, Poland and the USA. That's why students and scientists of the Department have an opportunity to take long-term pre-diploma training or scientific probation in Germany and Poland.

Task 1.46. Before reading the text, match the Ukrainian word combinations with their English equivalents:

- A. 1. користуватись великим попитом, 2. автоматизовані системи управління, 3. підтримувати традиції, 4. творчий колектив, 5. працевлаштування, 6. гонка озброєнь.
B. 1. computerized control systems, 2. arms race, 3. creative team, 4. employment, 5. to be in great demand, 6. to maintain traditions.

The Department of Automation and Telemechanics came into being in March 1945. Though World War II was still raging in Central Europe, our people began to restore the national economy, and the Department helped the country to accelerate the

process by training highly-qualified specialists. Besides, in the post-war period, stimulated by the arms-race and space exploration, IT (information technology) emerged as a new field of science to be investigated and developed. A lot of prominent scientists, Professors and Doctors of Technical Sciences, are known to have worked at this Department, among them were: K. Karandeyev, B. Sinitsyn, B. Shvedsky, N. Shumilovsky.

The scientific and research traditions of the Department are maintained by the present generation of scientists: Prof. M. Havryliuk, Honored Inventor of Ukraine Prof. V. Dudykevych, Prof. N. Samotiy and many others. The members of the Department proved to be an extremely creative team, having developed a digital voltmeter, portable microprocessor pyrometer and other automation and measuring devices.

The Department trains experts in such specialties as computerized systems, information security, and computer engineering. Here students take courses in the following subject areas: automation and telemechanics, automation and control in technical systems, computerized control and automation systems. It has a number of study rooms and laboratories equipped with modern computers and other devices, where students have an opportunity to deepen their knowledge and develop professional skills. And, of course, they take their practical training at leading enterprises of Lviv region and Ukraine. As a rule, the graduates of the department have no problems with employment as experts in this field are in great demand.

Task 1.47. Before reading the text, match the Ukrainian word combinations with their English equivalents:

- A. 1. побутові прилади (техніка), 2. керування роботою двигуна та інших систем автомобіля, 3. робототехніка, 4. тепловізор, 5. мікрохвильова піч, 6. касовий апарат, 7. технічне обслуговування і ремонт, 8. пристрій для зчитування штрихкоду, 9. жорсткість поверхні, 10. мініяторність, 11. оргтехніка.
- B. 1. maintenance, 2. infra-red imager, 3. microwave oven, 4. diminutiveness, 5. domestic appliances, 6. office mechanization facilities, 7. control of car engine and other systems performance, 8. checkout till, 9. robotics, 10. bar-code reader, 11. surface rigidity (stiffness).

The Department of Precision Mechanics (Mechatronics) Devices was founded in 1962 on the basis of the Department of Machine Parts. For more than 30 years it belonged to the Mechanical Engineering Faculty, but in 2001 the Department was transferred to the Institute of Computer Engineering, Automation and Metrology, because most precision mechanics devices are intended for automation, measurement and computerisation.

Nowadays computers can be found everywhere: from power plants and factories to schools and homes. Having come into being as a result of the development of science, computers, in their turn, affected every field of science and technology, causing the emergence of new trends such as, for example, computer mechatronics (COMPUTER + MECHANICS + elecTRONICS). This interdisciplinary branch uses achievements in

precision mechanics, electric engineering, electronics, automation, robotics, informatics, optics and medicine. .

Students of mechatronics deal with technological equipment designed for production and installation of electronic devices, microprocessor devices intended for control of car engine and other car systems performance, instrumentation for measurement of mechanical quantities (weight, geometrical dimensions, surface rigidity). They are trained to be experts in design and maintenance of domestic appliances (washing machines, microwave ovens, refrigerators, vacuum cleaners, video- and audio-recorders), optical and mechanical apparatuses such as photo- and video-cameras. Students of this department acquire knowledge and practical experience in handling biomedical apparatuses and medical equipment (such as tomograph, cardiograph, infra-red imager etc.), service facilities (electronic scales, bar-code readers, checkout tills etc.), office mechanisation facilities (scanners, printers, facsimile and Xerox apparatuses), and so on.

The characteristic feature of mechatronics articles is their diminutiveness, which creates certain material, structural and technological problems to be solved by experts in this field. That's why graduates of the Department are in great demand on the labour market.

Task 1.48. Before reading the text, match the Ukrainian word combinations with their English equivalents:

- A. 1.перетворення та передача даних, 2. інженер з техобслуговування, 3. продаж та доставка, 4. обслуговувати, тримати в добром стані, 5. інженер-програміст, 6. виклик, 7. інженер апаратного забезпечення, 8. складний, 9. добре обізнаній, 10. виявлення та усунення несправностей, 11. безнадійно застарілий;
- B. 1. hardware engineer, 2. challenge, 3. software engineer, 4. troubleshooting, 5. sophisticated, 6. sale and delivery, 7. data conversion and transfer, 8. desperately obsolete, 9. to maintain, 10. network support engineer, 11. well-versed.

Computer Engineering Department. Those, who look for a well-paid job, know that nowadays computer literacy is a required skill for a specialist in any branch of industry. Looking at bulky machines of the 1960s, few people could foresee that it would take computer less than half-a-century to become an essential part of our everyday life. Among these few people were teaching staff of Lviv Polytechnic who founded the Computing Engineering Department in 1963. It was quite a challenge, because computer engineering proved to be the most dynamically developing field of human knowledge. As computers are getting more and more sophisticated, the society needs highly-qualified experts able to design, produce, operate and maintain computers.

At this department, students take courses in computer components, programming, data conversion and transfer, computer networks and information security. The Department has its own computer laboratories where students may perfect their professional skills, though most students either have computers at home or attend computer clubs.

Graduates of this Department can work as: (1) hardware engineers who develop computers and their components, or are involved in manufacturing, installation and testing of computers; (2) computer network support engineers who are responsible for troubleshooting, i.e. location and elimination of faults in networks; (3) software engineers who design, test and improve programs; or (4) computer sales persons who advise potential customers, which hardware to buy, and organize its sale, delivery, installation and testing. In general, those who have chosen computer engineering as their future profession should be well-versed in the latest achievements in this field, as both hardware and software are being constantly upgraded, and five-year-old computer technologies are considered to be desperately obsolete.

Task 1.49. Before reading the text, match the Ukrainian word combinations with their English equivalents:

- A. 1) переносний цифровий термометр; 2) промислове виробництво; 3) комплект; 4) напівпровідниковий перетворювач; 5) вологомір; 6) витрати енергоносій; 7) зразкові засоби вимірювання; 8) програмні і апаратні методи; 9) еталон; 10) технічний контроль за якістю продукції.
- B. a) semiconductor transducer; b) complete set; c) reference measuring devices; d) quality inspection; e) program and apparatus methods; f) portable digital thermometer; g) basic (primary) standard; h) industrial production; i) consumption of energy carriers; j) hydrometer.

The Department of Metrology, Standardization and Certification was founded in December 1995, with Prof. P. G. Stoliarchuk at the head. The teaching staff is considered to be academically strong. It consists mainly of professors and assistant-professors. The members of the staff not only deliver lectures and supervise students' work in the laboratories, but also carry out scientific research and develop apparatus and devices to be introduced into mass-production. Some members of the Department are known to have developed portable digital thermometers to be used as a complete set with semiconductor and thermo-electrical transducers. Besides, a lot of other devices developed at the Department are sure to find wide application in industry, among them are: hydrometers, pyrometers, and meters for evaluation of consumption of energy carriers and various kinds of energy.

At the Department, third-year students take courses in the following special disciplines: fundamentals of metrology and measuring techniques, theoretical metrology, technology and design of measuring devices, fundamentals of digital and microprocessor techniques etc. To consolidate their theoretical knowledge and to acquire practical skills, students are to carry out experiments in the laboratories of the Department. Here students get acquainted with program and apparatus methods of testing, computerized systems of experimental investigation, basic standards and reference measuring devices.

The Department maintains close relations with industrial enterprises and research institutions of Lviv region, and provides students with an opportunity to have industrial training at Lviv Plant of Electric Measuring Devices, Lviv Centre for Standardization

and Certification, confectionary firm “Svitoch”, Lviv Institute of Automobile Industry, and many other enterprises.

The Department trains specialists for many branches of national economy. Its graduates may work as metrologists, engineers at quality inspection and certification departments of different plants, engineers of Consumer Rights Protection Service and Customs Inspection Service, tax-police inspectors, as well as experts in metrology and standardization in food and tool-manufacturing industries. The most gifted graduates take postgraduate courses and become lecturers at higher educational establishments, and continue doing their research work.

Task 1.50. Suppose, all students in your group decided to apply for a part-time job according to your future qualification, after reading the announcement in a newspaper. The job is well-paid, but the company has only one vacancy. It means that you will have to compete for the job. After submitting your applications, you are to be interviewed by the would-be employer. **Be frank**, answering the following questions, and then choose one student (with the most positive image) as a successful candidate for the job:

Education:

1. Are you doing well at the university?
2. Are you studying subjects essential for your future profession?
3. Have you ever taken part in any scientific seminars, conferences or competitions?
4. Are you engaged in any kind of research work?
5. Have you ever written course projects?
6. Do you do your homework regularly?
7. Is your knowledge of English sufficient for reading scientific information presented in this language?
8. Do you know any other foreign languages?
9. Do you always pass exams successfully?

Work Experience:

10. Do you often operate a computer?
11. Are you familiar with many different computer programs?
12. Have you ever taken on a job (of any kind) before?

Personal Details:

13. Do you always come to lectures in good time?
14. Do you avoid missing lectures at the university for no good reason?
15. Are you engaged in any cultural or social activities at the university?
16. Do you avoid conflicts with your fellow students or teachers?
17. Are you against smoking, taking illegal drugs, and alcohol abuse?
18. Is your vocabulary normative? Do you avoid using abusive, bad language?
19. Are you a dutiful person?
20. Do you often help your fellow students with their studies?

The unsuccessful candidates should draw conclusions and take actions for improving their image before participating in the real competition for a job. Success attend you!

SECTION VIII. INSTITUTE OF CIVIL AND ENVIRONMENTAL ENGINEERING

Task 1.51. Before reading and discussing the text with your fellow students, match the following Ukrainian word combinations with their English equivalents:

1. будівельні конструкції, 2. будівельне виробництво, 3. автомобільні шляхи,
4. будівельна механіка, 5. сантехніка, 6. галузева лабораторія, 7. кафедральна науково-дослідна лабораторія, 8. державний орган з сертифікації будівельних матеріалів, виробів та конструкцій, 9. випробувальна лабораторія, 10. будівельно-монтажні роботи, 11. реконструкція будівельних об'єктів, 12. природокористування.

1. Reconstruction of installations; 2. State body for certification of building materials, items and constructions; 3. sanitary engineering; 4. testing laboratory; 5. nature management; 6. building constructions (building structures, structural constructions); 7. structural mechanics; 8. civil engineering and installation work; 9. civil engineering production; 10. departmental research laboratory; 11. motor roads; 12. applied-research laboratory.

INSTITUTE OF CIVIL AND ENVIRONMENTAL ENGINEERING

The Institute of Civil and Environmental Engineering has a long history. In Lviv, first civil engineers were trained at several departments of civil-engineering profile at the Real School. Then the departments united and formed the Faculties of Engineering and Architecture at Lviv Technical Academy, and later transformed into the Civil Engineering Faculty at Lviv Polytechnic Institute. In 2001 this Faculty formed the basis for creation of the Institute of Civil and Environmental Engineering at the Lviv Polytechnic National University.

The Institute has always employed a highly-qualified, talented and creative teaching staff who greatly contributed to science: Professors M. Tulie and R. Huber were the authors of well-known works in the field of durability and designing structures; Professors G. Bohutsky and I. Rikhter created the first textbooks on structural mechanics and general engineering, the investigations carried out by such scientists as K. Skibinsky, S. Breeda, V. Minakevych and many others were aimed at applying theory to solving problems of

designing and construction. The staff of the Institute has always paid great attention not only to the training of highly-qualified specialists, but also to the development of the material base of the whole University: for example, the main building of the University was designed (1872) and constructed' (1873-1877) under the guidance of Prof. Yulian Zakharieyych; after the project of Professors V. Minakevych and A. Kurylo the academic building of the Mechanical Department was built; and Prof. Obminsky designed the building of the University's library and book depository; later a lot of new academic buildings, hostels, recreation and sports facilities were designed and constructed. Nowadays there are more than 100 members on the teaching staff of the Institute, including 8 professors and 70 associate-professors. They work at six departments of the Institute, namely: the Department of Building Constructions and Bridges, Department of Civil Engineering Production, Motor-Roads Department, Department of Bridges and Structural Mechanics, Department of Hydraulics and Sanitary Engineering, Department of Heat and Gas Supply and Ventilation.

The Institute has at its disposal 3 applied-research laboratories; 6 departmental research laboratories; a State body for certification of building materials, items and constructions "LvivSEPRObud" and 3 testing laboratories accredited in the UkrSEPRO system. The Institute has created favourable conditions for the development and upgrading of professional skills, and re-training of scientific personnel.

With the aim of raising the level of training of future applicants, the Institute has created an educational-scientific-production complex "Personnel for Civil Engineering". It comprises the Institute itself, a civil-engineering technical school, a motor-road technical school, and a technical and economic college in Lviv. This cooperation enables admitting to the University the graduates of the above-mentioned educational establishments on the basis of their final examination results and an interview.

About 1500 students are studying now at this Institute. They acquire knowledge both in general and special subjects, and after four years of successful study they are awarded the degree of Bachelor of Science. Those who want to gain Specialist's or Master's degree should continue their study for a year and a half and defend their diploma projects. Educational process at the Institute is closely connected with research work and practical training. Students work in laboratories, take part in designing work and successfully master professional skills. In the Institute there are six study-rooms equipped with modern computer, where students gain profound knowledge in the design of building constructions and processes. Students have industrial training at leading enterprises and construction sites of Lviv region. The best students annually take practical training in construction companies of Germany and Poland. After graduating from the University, some students take post-graduate courses and work on dissertations. But most graduates look for jobs according to their qualifications. They are employed as design engineers, production engineers, construction supervisors, inspection engineers etc.

The general direction of the scientific activity of the Institute is the development of energy-resources-saving technologies for creation of effective constructions, items and materials for civil-engineering-and-installation work, and reconstruction of installations and motor roads (highways), taking into account the trends in rational nature management and environmental protection. The Institute maintains the long-standing educational and scientific traditions which formed during its more than 130-year-old history.

Task 1.52. Before reading and discussing the text with your fellow students, match the following Ukrainian word combinations with their English equivalents:

1. міське будівництво та господарство, 2. транспортний тунель, 3. водопостачання та водовідведення, 4. жаростійкий матеріал, 5. протипожежна обробка, 6. водозабірні та розподільчі системи, 7. водогінна та каналізаційна системи, 8. міська каналізаційна мережа, 9. житлово-комунальні служби, 10. пожежна профілактика, 11. органи державного пожежного нагляду.

1. water conduit and sewerage systems, 2. refractory material, 3. urban construction and facilities, 4. state fire inspection bodies, 5. public housing services, 6. vehicle traffic tunnel, 7. fire-preventive maintenance, 8. fireproofing, 9. water supply and disposal, 10. sanitary works, 11. water intake and distribution system.

SPECIALITIES TAUGHT AT THE INSTITUTE OF CIVIL AND ENVIRONMENTAL ENGINEERING

The Institute of Civil and Environmental Engineering, one of the largest at our University, trains students in three directions of specialisation: Civil Engineering, Water Resources, and Fire Safety. As the scope of civil engineering has become very broad, it involves many other professional areas, including law, ecology, public health, economics, management, finance, and other branches of engineering. Students of the Institute study a lot of different subjects: physics, mathematics, strength of materials, drawing, theoretical and applied mechanics, building materials, history, economics of building work, philosophy, a foreign language.

The direction *Civil Engineering* comprises such specialities as: *Industrial and Civil Engineering, Urban Construction and Facilities, Technology of Building Structures, Items (Products) and Materials, Motor-roads (Highways) and Aerodromes, Bridges and Vehicles Traffic Tunnels, Heat and Gas Supply and Ventilation*.

The history of building extends as far back as that of civilization itself. Builders created seven wonders of the world. The 20th century rapid scientific and technological progress with a wide range of new building materials and advanced methods of construction, turned civil engineering into a broad professional field. The word "construction" is used in a general sense today to cover the erection and repair of all types of buildings, roads, bridges and other structures. The word "building" is mainly concerned with domestic dwellings, including small dwelling houses and blocks of flats, schools, hospitals, churches and office blocks, while "civil engineering" deals more with surrounding features (infrastructure) like bridges, roads, airports, water conduits, and power stations. Civil engineering projects are mostly on a greater scale and take longer to complete than the average building work.

Those who obtain the qualification of a civil engineer at our institute are engaged in housing construction, construction and reconstruction of plants, factories, mines, sports facilities, public and administrative buildings, supervising and managing the

implementation of projects. Some of the graduates work at designing bureaux or educational establishments.

Automobile is one of the most efficient means of transport. To provide safe and quick transportation, a large network of highways is required, because roads are blood vessels of the country, they bring everything required for people's life, for regular work of industrial enterprises and agriculture. Not a single branch of national economy is able to exist without roads. Those who obtain the qualification of road engineers will be engaged in the development of modern complexes of engineering structures facilitating steady and speedy traffic, service facilities for passengers and drivers. As a highway complex includes first of all the road itself, petrol stations, motels, parking areas, bus stops and complicated engineering structures such as bridges, viaducts, tunnels and so on.

The direction *Water Resources* includes the speciality *Water Supply and Disposal*. It's a speciality of ecological profile. To turn constructed buildings into homes and offices, people should provide them with heating, ventilation, water supply and sewerage. Water is vital for living beings. With the growth of population and development of industries, availability of fresh water has become an urgent problem. Governments adopt laws against environmental pollution. Students majoring in this field study water intake and distribution systems, hydraulics, and operation of water conduit and sewerage systems. Specialists in this field may work for water works, sanitary works, departments of the Ministry of Ecological Resources, designing institutes and building companies or public housing services.

Specialists in the field of *Fire Safety* possess knowledge necessary for protection of houses and other built environments against fire. They study refractory materials, fireproofing, and fire-fighting devices and techniques. Graduates who gained this qualification can arrange fire protection and fire preventive maintenance of dwelling and industrial buildings. They can work for fire-fighting services, State fire inspection bodies, designing bureaux, research institutes and educational establishments.

SECTION IX. HUMANITIES AND SOCIAL SCIENCES INSTITUTE

Task 1.53. Discuss the following questions in small teams, write down all the ideas and present them to the whole group after the discussion:

What do you know about your institute?

What are your favorite subjects ? Why?

Where would you like to work after graduating from the university?

Task 1.54. Memorize the essential vocabulary and translate the sentences containing it:

1. **authentic** – справжній, достовірний, автентичний – genuine, true, reliable, e.g. *The students were suggested to read the text containing the elements of authentic information.*
2. **forged** – підроблений, - an illegally copied (a document, a painting, a piece of paper money etc.) e. g. *His passport proved to be a forged one.*
3. **authenticity** – автентичність - the quality of being true or authentic, e. g. *The results of these chemical tests have cast doubt on the authenticity of this painting.*
4. **forgery** – підробка - an illegally copied document, painting, a piece of money, etc., e. g. *The painting is considered to be a very clever forgery.*
5. **archives** (pl.) – архів - place for keeping public or government records; other historical records, e. g. *Archives contain records which may be written or printed papers, pictures, photographs, films etc.*
6. **archivist** архіваріус - a person in charge of archives, e. g. *He has enough knowledge and abilities to make a good archivist.*
7. **deliver** – проводити, читати лекції, курси - to utter, pronounce (a speech, a lecture etc.) to an audience, e. g. *The Department of Ukrainian History delivers courses in the following subjects: History of Ukraine and its Sovereignty, Ukrainian and Foreign Culture, Science and Engineering History.*
8. **draw up** (drew, drawn) – складати документ - to make a draft of a document, a plan etc., e. g. *The document has been drawn up in accordance to the established procedure.*
9. **drawing up** – складання документу - the act of producing a document, a plan etc., e.g. *Companies of different forms of property are to follow the same rules of documents drawing up and their registration.*
10. **examine** – здійснювати перевірку, експертизу - to look carefully and closely at, inspect in order to discover the facts, e. g. *He is to examine the materials properly before coming to the final decision.*
11. **examination** – перевірка, експертиза - an inspection, testing of sth., e. g. *Documents value examination requires a great deal of accuracy.*
12. **expert** – експерт - someone whose knowledge or skill is specialized and profound, esp. as the result of much practical experience, e. g. *He is a first-rate expert in the sphere of documents value examination.*
13. **file** – підшити, приклсти до справи - to place a document with others so as to be available for reference, e. g. *The secretary has already filed the documents.*
14. **file** – підшита справа - a set of documents arranged one behind the other for ease of reference, e. g. *The secretary came in holding a blue file.*
15. **further** – додатковий, подальший - additional, more remote in time, e. g. *Further education ensuring the Master's degree can be obtained on the competitive rating grounds.*

16. **the humanities** – гуманітарні науки - studies (history, art, literature, classics etc.) emphasizing the cultural aspects of civilization, e. g. *The humanities contribute a great deal to the development of the students.*
17. **introduce** – запроваджувати, започатковувати - to bring into use or practice, e. g. *In the 2000-2001 academic year a new speciality Documents and Informational Activity was introduced at the Department of Ukrainian History, Science and Engineering.*
18. **major** – спеціалізуватись - to study in greater size, to specialize in a certain subject, e. g. *She majored in Public Relations at the university.*
major – спеціалізація, основний предмет - an academic subject studied more extensively than others, e.g. *What is his major ?*
19. **normative** – нормативний - relating to a norm, setting a standard, e. g. *Normative documents are considered to be a reliable source of information.*
20. **permanent** – постійний - continuing or enduring without change, e. g. *The most valuable documents need permanent storage.*
21. **post-graduate** – аспірант - a student who continues his studies beyond the first degree, e. g. *Post-graduates are the ablest students who continue their study after graduating from the university.*
22. **profound** – глибокий, значний - very great, intense, deep, e. g. *The students have all opportunities to obtain profound knowledge in general as well as in special subjects.*
23. **records** – характеристика, особова справа - facts concerning the past performance of a person, e. g. *He has excellent personal records from his previous job.*
24. **seal** – печатка - a sign or a guarantee of authority, approval etc., e. g. *He gave the document the seal of his consent.*
25. **sign** – підписувати - write one's name on a document, letter etc. for official purposes to show that one agrees with its contents, e. g. *The letter isn't signed so we don't know who it's by. Business letters should be signed in ink, clearly and legibly.*
signature – підпис - person's name written by himself, e. g. *Her signature is almost illegible.*
26. **staff** – персонал, штат - the personnel of an organization, e. g. *Ukrainian Language and Business Ukrainian are taught by the teaching staff of the Ukrainian Language Department.*
27. **standard** – стандарт - a norm to be followed, a necessary level or degree of sth, e. g. *The main task of the course is acquiring practical skills in using state standards.*
standardize – стандартизувати – to make conform to a standard, e.g. *You should standardize these papers, i. e. prepare them according to fixed norms.*
28. **store** – зберігати - to accumulate and keep for future use, e. g. *The most valuable information has been stored in the computer.*
storage – зберігання - accumulation, keeping, e. g. *Our group got acquainted with classification of the documents, their permanent and temporary storage.*
29. **temporary** – тимчасовий - lasting only for a short time, e. g. *The new premises were given into a company's temporary usage.*

30. **unify** – уніфікувати - to make one or become one, e. g. *The system of classification and coding of technical and economic information has been unified.*

unification – уніфікація

The main trends of documents unification and standardization are studied in the course of Business Correspondence.

31. **value** – цінність - usefulness, importance, e. g. *These human values are held in high esteem in every company.*

value – оцінювати - to estimate the value of sth., e. g. *She values the advice of her parents.*

32. **wide-spread** – поширений - extended over a wide area, widely circulated, e. g. *The Foreign Languages Department offers courses in the most wide-spread foreign languages.*

33. **would-be** – майбутній - desiring or aspiring to be, e. g. *The would-be office work experts should take into account social-psychological aspects and professional ethics issues.*

Task 1.55. Complete the words to match the definitions given:

1. genuine, true, reliable	_ u t _ e _ i _
2. to bring into use or practice	_ n _ d _ c _
3. relating to a norm	_ o _ m _ _ i v _
4. continuing or enduring without change	p _ _ m _ _ e _ t
5. very great, intense, deep	p _ o _ o _ n _
6. to accumulate and keep for future use	_ _ o _ e
7. lasting for a short time	_ e _ _ o _ a r _
8. to make or become one	_ n _ f _
9. extended over a wide area	w _ _ e - _ p _ e a _
10. usefulness, importance	v _ _ u _

Task 1.56. Match the following words with their definitions:

- A. 1. archives; 2. to deliver; 3. to draw up; 4. to examine; 5. major; 6. records; 7. staff; 8. to file; 9. the humanities; 10. a post-graduate.
- B. a) studies emphasizing the cultural aspects of civilization;
 b) facts concerning the past performance of a person;
 c) to make a draft of a document;
 d) to inspect in order to discover the facts;
 e) a place for keeping public or government records;
 f) a student who continues his studies beyond the first degree;
 g) to utter, to pronounce to an audience;
 h) to place so as to be available for reference;
 i) the personnel of an organization;
 j) an academic subject studied more than others;

Task 1.57. Read the text and render its content either in the form of a dialogue or an interview:

THE HUMANITIES AND SOCIAL SCIENCES INSTITUTE

The Humanities and Social Sciences Institute is an educational and scientific substructure of Lviv Polytechnic National University.

The Institute offers a humanities teaching system for the students to obtain profound knowledge in the History of the Ukrainian State, Ukrainian and World Culture, Ukrainian language, Philosophy, Political Science, Sociology, History of Religion and wide-spread foreign languages.

The Institute consists of nine general educational Departments: Ukrainian History, Science and Engineering; Political Science; Sociology and Social Activity; Philosophy; Ukrainian Language; Foreign Languages; Engineering and Pedagogical Training; Documents and Informational Activity; Physical Education.

The Department of Ukrainian History studies and delivers courses on the following subjects: History of Ukraine and its Sovereignty, Ukrainian and Foreign Culture, History of Ukrainian Science and Engineering, Documents and Informational Activity etc.

There are post-graduate studies and a Specialized Council at the Department making it possible to defend theses concerning History.

The Departments of Political Science and Sociology carries out studies and offers courses in Political Science, Sociology, Social Psychology and Public Relations.

Philosophy and History of Religion are the main subjects at the Department of Philosophy and Study of Culture having post-graduate studies.

The Ukrainian language and Business Ukrainian are taught by the teaching staff of the Ukrainian Language Department.

At the Department of Foreign Languages students attend practical classes of English, German, French, Spanish, Japanese and Latin. They also have some special courses, namely Business Foreign Language and Foreign Language for Specialists.

In the 2000-2001 academic year a new speciality Documents and Informational Activity was introduced at the Department of History of Ukrainian, Science and Engineering in the framework of the «Culture» training direction. It is aimed at meeting the market needs in specialists on business documents, public relations, informational systems coordinators in production and non-production spheres.

Basic studies lead to the Bachelor's degree. Further education ensuring the Master's degree can be obtained on the competitive rating grounds. The Bachelor's and the Master's courses meet West European Higher School standards.

Those who major in this speciality possess not only special knowledge. In the course of studies they are taught two foreign languages besides Latin, jurisprudence (science of law) and acquire practical skills of using computer in their work. While studying office work

and business correspondence they get acquainted with State standards and different types of normative documents as a reliable source of information, their classification, permanent and temporary storage, documents value examination, the official registration procedure of files/dossiers, personal records etc. The would-be archivists, office work experts, business correspondence clerks, secretaries-reviewers study the structure, tasks and functions as well as organization of the administrative activity (its content and characteristic features); organization of the work with administration personnel; conducting negotiations, meetings taking into account social-psychological aspects and professional ethics issues. Having a good command of foreign languages and knowing the main trends of documents unification and standardization; the rules of drawing up documents and their official registration in accordance with established procedure graduates may work successfully for companies of different branches and forms of property, scientific and research institutes, State Archives, commercial and other structures.

Task 1.58. Read the following international words, and guess their meaning:

Standard, normative documents, unification, structure, function, organization, social and psychological aspects, archives, professional ethics, type, expert, documentation, classification, information, jurisprudence, coordinator, philosophy, sociology, history, religion, culture, informational systems, sphere.

Task 1.59. Form derivatives of the following words, using suggested suffixes:

- ist: archives, science, sociology, special, psychology, economy;
- er: philosophy, teach, foreign, defend, lead, work, review, research;
- al: education, culture, practice, information, person, ethics, structure, function, organization;
- ian: history, Ukraine, academic.

Task 1.60. Complete the sentences, selecting words from the following list: examined, standards, accordance, personal records, documentation, philosophy, humanities, normative, reliable, expert, defend, postgraduate studies.

1. The secretary failed to find his _____.
2. He is an ___ in information security.
3. Last week I attended a lecture on the ___ of Ancient Greece, which was dedicated to Socrates.
4. Several graduates of our department were admitted to _____.
5. The document should be ___, because we doubt its value.
6. To gain the title of Candidate of Science, you should pass exams and ___ thesis.
7. Do you think that the Internet is a ___ source of information?
8. In the Lviv Center of Standardization and Certification you may get acquainted with state ___ and different types of ___ documents.

9. Our university offers courses both in technical sciences and ____.
10. The documents must be officially registered in ____ with established procedure.
11. This year they will take a course in fundamentals of unified systems of ____ , used in automation control systems.

Task 1.61. Complete the sentences with derivatives of the given words, using proper suffixes:

-(a/i) tion, -ing, -al, -tivity, -s, -ative, -ed, -able, -ability.

1. **to examine**
- a) The ____ of documents value should be performed by experts.
b) At this practical class, students were ____ authentic and forged documents.
2. **to inform**
- a) He has chosen this specialty, as he is interested in ____ activity.
b) Unfortunately, there is very little ____ on this subject in the Internet.
3. **to produce**
- a) Informational systems have become vital for proper functioning of institutions and enterprises in ____ and non-____ spheres.
b) Installation of computers has greatly increased labour ____ at this plant.
4. **norm**
- a) The agreement has been reached in accordance with the ____ of international law.
b) State standards and ____ documents are a reliable source of information.
5. **to acquaint**
- a) She hasn't got ____ with this document yet.
b) An ____ of mine works as a secretary-reviewer.
6. **to rely**
- a) They doubt the ____ of this source of information.
b) This system isn't ____ enough to be used in production process.
7. **to register**
- a) Yesterday his application was officially ____.
He would like to know more about the procedures of documents official ____.

Task 1.62. Identify the subjects you are taught by their definitions:

- A. 1. sociology; 2. history; 3. study of culture; 4. engineering; 5. ethics; 6. philosophy; 7. jurisprudence; 8. the humanities; 9. linguistics 10. political science.
- B. a) moral philosophy or moral science, i.e. that branch of philosophy which studies the principles of right or wrong in human conduct;
b) the science or philosophy of law;

- c) the search for knowledge, esp. the nature and meaning of existence; system of thought resulting from such a search;
- d) the study of the origin, history and the structure of human society and its institutions;
- e) studies (history, art, literature, classics etc.) emphasizing the cultural aspects of civilization;
- f) branch of knowledge dealing with past events, political, social, economic of a country, continent or the world;
- g) study of evidence of intellectual development (of art, science etc.) in human society; all the arts, beliefs, social institutions etc. characteristic of a community, race etc.;
- h) the scientific study of language or languages whether from a historical and comparative or from a descriptive, structural point of view;
- i) the science of applying knowledge of the properties of matter and the natural sources of energy to the practical problems of industry (e. g. the construction of industrial plants or machines) ;
- j) the study of the nature and functions of the state and of the government.

Task 1.63. Rearrange the following jumbled words and phrases to form sentences:

1. to be, the document, copied, printed, and , illegally, is said.
2. still, are, under, the proposals, examination.
3. letter, the original, haven't got, I , its copy, have got, I, but.
4. to deal with, twice a week, comes, a secretary, his, correspondence.
5. excellent, the, is, staff, teaching.
6. the computer, data, in, a mass of, stored, is,
7. temporary, now, a lot of, work, is.
8. documents, all, will be, the necessary, agreed, signed, and.
9. read, signature, his, I, couldn't, illegible.
10. value, practical, of great, has been, advice, his.

Task 1.64. Read the dialogue and discuss the questions given below:

- A: - Hi! I'm broken. Have you heard of any possibilities to earn some extra money?
- B: - Well, I was lucky enough to find not a only profitable but also an interesting and useful job related to our speciality.
- A: - You don't say so! You attend all the lectures and practical classes. When do you work?
- B: - I'm a secretary of a virtual office.

- A: – What do you mean by a virtual office? Where is it situated?
- B: – A virtual office needs neither special premises nor furniture. Actually it's my home computer.
- A: – How do you manage to combine your business activity with your studies? Isn't it difficult?
- B: – Not at all. I work only a fortnight a month during the second shift (from 3 to 11 p. m.). It's suits me perfectly. What's more, this virtual office makes it possible to earn quite real money. My salary is 200 hryvnias.
- A: – Not bad I should say. Were you the only applicant?
- B: – Oh, no. There were more than 80 of us. But employers give preference to people with higher education and students.
- A: – Have you had an interview?
- B: – Sure. During the interview the applicant must reveal proper communication skills and language abilities.
- A: – What about computer test?
- B: – Nothing special. You are to find some necessary information and to type quickly enough.
- A: – Do you manage to cope with all your duties?
- B: – There are no problems with it. I'm responsible for telephone calls, e-mail and faxes. We also have web-designers creating web pages for our staff. In future our firm will offer preparing agreements and law services.
- A: – Oh, it's great. This job gives a lot of possibilities for professional level improvement, to say nothing about a decent salary for a student.
- B: – By the way, you may be a secretary of several virtual offices simultaneously.
- A: – Incredible. Thank you for such vital information.

Questions:

1. Do you consider the situation described in the dialogue to be worth following?
2. Being a student have you ever tried to find a part-time job? Were you successful?
3. To your mind, are there any advantages or disadvantages in studying and working simultaneously?

Task 1.65. Choose the proper forms to fill out the gaps:

1. I saw him _____ the document.
a) to sign b) sign c) to have signed
2. The would-be archivists are supposed _____ the rules of the documents official registration.
a) know b) to be known c) to know
3. We didn't expect this reliable source of information _____ so soon.
a) find b) to have found c) to be found
4. I saw the employer _____ your records.

- a) to read b) read c) to have read
5. The teachers made us _____ extremely hard on the training course.
 a) work b) to work c) to have worked
6. They suppose the commission of experts _____ a thorough examination of the document.
 a) to make b) to have made c) make
7. The lawyer advised us _____ with the contract carefully.
 a) get acquainted b) to get acquainted c) to have got acquainted
8. We consider him _____ the expert in drawing up official documents.
 a) be b) to be c) to have been
9. The boss made the subordinates _____ until the work was finished.
 a) to stay b) stay c) to have stayed

Task 1.66. Use Complex Subject instead of the subordinate clauses, e.g.:

- It is known that a new specialty Documents and Informational Activity was introduced at the Chair of History last academic year.
 - A new specialty Documents and Informational Activity is known to have been introduced at the Chair of History last academic year.
1. It is considered that the most important documents require permanent storage.
 2. It is said that he is a first-rate expert in the sphere of documents value examination.
 3. We are sure that the humanities enrich the spiritual life of the young people.
 4. It is likely that this part of his job will give him the greatest satisfaction.
 5. It is believed that a document is an official paper or a certificate that gives information or supplies evidence.
 6. It was reported that the document had been proved authentic.
 7. It is known that our graduates are fully qualified specialists.
 8. It was stated that the papers were not prepared according to the fixed norm.
 9. It is likely that they will find the work in the archives the most difficult.
 10. It is considered that English is one of the most wide-spread foreign languages in the world.

Task 1.67. Translate the sentences into English, using Complex Subject and Complex Object :

- C. Кажуть, що студенти ознайомилися з основними правилами складання та оформлення документів.
- D. Відомо, що найцінніші документи повинні зберігатися у державних архівах.
- E. Ми бачили, як він підписував контракт.
- F. Очікують, що комісія зробить експертизу цього документа належним чином.
- G. Вважають, що вона особливо цікавиться спеціальними предметами.

APPENDIX A. KEYS TO THE TASKS

Key to task 2. Text “Some Problems of Higher Education”:

For centuries humanity has been accumulating knowledge and passing it from generation to generation, though not all members of the human community had free access to this knowledge. Till the 20th century there existed property, social and even racial barriers for those who wanted to gain higher education. Colleges for women had appeared only by the end of the 19th century. At that time the industrial revolution was gaining momentum. It set new requirements to labor. Mechanization and later automation of production processes created a great demand for highly qualified specialists, and this led to democratization of education and establishment of numerous technical higher schools. Nowadays in our country a system of free higher education coexists with system where a student has to pay a fee for the tuition received at a state or private higher educational establishment. It means that anybody may enter a higher school.

But unfortunately, not all graduates are guaranteed employment in the field of their specialization. And even if graduates do get jobs according to their qualification, some of them are not ready for their profession immediately after graduation. The reason for it is lack of experience. Of course, higher schools do their best to give students both theoretical and practical training, but their funds are not sufficient to constantly modernize their scientific and research facilities. In many cases, students have no opportunity to obtain practical training in the specific branch of national economy. The solution to this problem could be cooperation between higher schools and businesses. For example, an enterprise could invest some of its funds in creation of a modern production training basis for a higher school on condition that this higher school would work off money spent on it. It means that the higher school would (1) design some new products to be manufactured by this enterprise, (2) develop advanced equipment, materials, and technologies to be used in the production process, and (3) would train specialists for this enterprise. So both the enterprise and the higher school would benefit from this cooperation.

Though it's no use just sitting and waiting for a wealthy sponsor to come. You should take an active attitude towards studying, that is, apart from acquiring knowledge at lectures and practical classes, and participating in seminars and students' scientific conferences, you should look for ways of applying your theoretical knowledge to practice. For example, with a little bit of good luck and help from your friends you are sure to find some part-time job in your field of specialization. Of course, you can't expect to be employed as an engineer, but being a trainee technician also has its advantages: you'll see the inside of the business, master practical skills of doing the work, get

acquainted with corporate culture in the working team. Besides, you will find out what subjects are vital for your future profession, and pay more attention to studying them.

In a documentary film about Coventry University, one of the deans says that in order to make a brilliant career, graduates not only need knowledge and competence, they should be self-confident and able to make decisions and tackle with any new situation or problem. So, listen to what the wise man says, draw conclusions and act accordingly. But do it now, because time is pressing, and our country desperately needs competent personnel for all branches of national economy.

APPENDIX B. VERB PATTERNS

Verb + object + infinitive (without to)			Modal or Auxiliary Verb + infinitive (without to)	
Let make help notice, see, watch hear	somebody	do	can, could shall, should may, might must will, would	do

Verb + to-infinitive		Verb + object + to-infinitive	
afford agree arrange ask appear attempt choose claim deserve decide expect forget	to do	advise allow beg encourage ask expect force (help) invite to do need order	somebody to do

Fail		permit	
help		persuade	
have		remind	
hope		teach	
learn		tell	
manage		want	
offer	to do	warn	
ought			
plan			
promise			
refuse			
seem			
threaten			
want			

Note :

1. To is used with **make** in the passive: *He was made to carry out a task.*
2. Let cannot be used in the passive. **Allowed to** is used instead :
She was allowed to use the car.

UNIT 2. LABORATORIES

In earlier days, people called places intended for carrying out experiments "workshops". There they prepared drugs, made technological inventions or even tried to discover "a philosopher's stone", as alchemists did. Some people thought them to be practising black magic, and destroyed their workshops. By the way, Isaac Newton is sometimes called the last alchemist and the first scientist.

At present, the word "laboratory" (from Latin "laboro", i.e. "I work") is used to denote any room or building intended for experimental investigation in technologies and sciences for the purpose of advancing man's knowledge. The word "laboratory" is also used to denote the work-room of a chemist, or special premises at an industrial enterprise or research institute for designing and testing new devices.

Among the most famous laboratories of the world we can mention the laboratory of the Royal Institution established in Britain in 1800 and devoted to applied and pure sciences. Such outstanding scholars as M. Faraday and I. Tyndall carried out experiments there.

The first physics laboratories founded for students appeared in 1846. Work in laboratories has been introduced into educational process at secondary and higher schools to teach scientific and technical knowledge by means of experimental activity. Besides, it enables students to learn how to handle the most sophisticated equipment and to master modern research methods.

Task 2.1. Discuss the following questions in small subgroups and then present your ideas to the whole group :

1. Laboratory facilities at our university.
2. Importance of students' work in laboratories.
3. Do you like to work in laboratories? Why?

SECTION I. AURAL COMPREHENSION

Task 2.2. Before listening to the text "The Labs of the Department of Physics", try to match the following English terms with their Ukrainian equivalents:

1. quantum nature of light; 2. substance, solid, liquid, vapour; 3. vibratory motion;
4. specific resistance; 5. phenomenon; 6. dimensions; 7. ac/dc; 8. wave length; 9. elec-

tric circuit; 10. analytical balance; 11. thermal properties; 12. electromagnetic oscillator; 13. frequency range; 14. mechanical interaction; 15. conductors and insulators.

1. генератор електромагнітних коливань, 2. теплові властивості, 3. електричне коло (схема), 4. діапазон частот, 5. аналітичні терези, 6. явище, 7. провідники та ізолятори, 8. питомий опір, 9. речовина, тверде тіло, рідина, пара, 10. коливний рух, 11. механічна взаємодія, 12. корпускулярна природа світла, 13. довжина хвилі, 14. розміри, 15. змінний струм / постійний струм.

Task 2.3. Listen to the text “The Labs of the Department of Physics” and answer the following questions:

1. Where are the laboratories of the department of physics situated?
2. What kind of lab exercises do students carry out in the laboratory of molecular physics?
3. What do they study in the electrical laboratory?
4. In which laboratory can students study the quantum nature of light?
5. What quantities can students measure in the physics laboratories?
6. What instrumentation do they use?

SECTION II. USE OF THE ESSENTIAL VOCABULARY

Task 2.4. Practise the pronunciation of the essential vocabulary. If you don't know the meaning of a word, try to guess it from the context:

1. **according to / in accordance with** – згідно, відповідно – in relation to smth., e.g. *Students can work in the laboratories according to the speciality chosen.*
2. **achieve** – досягати – to succeed in doing smth., e.g. *Using this experimental technique, you will achieve better results.*
achievement – досягнення – e.g. *They try to use all the latest achievements in their field of science.*
He was proud of his achievements.
3. **acquaint** – ознайомлювати – to make familiar with, e.g. *The laboratory assistant has just acquainted students with the rules of work in the laboratory.*
get acquainted – ознайомитись – e.g. *Don't start carrying out the experiment without having got acquainted with the instruction.*
4. **acquire** – набувати – to gain a skill, habit, esp. by one's own ability, efforts or behaviour, e.g. *Students acquire practical knowledge in the labs.*

5. **assess** – оцінювати – a) to estimate or decide the amount or value of something; b) to judge or form an opinion about something, e.g. *The work in the lab enables students to assess the practical value of their knowledge.*
6. **calculate** – обчислювати – to find something out by using mathematics, e.g. *He failed to calculate the square root of this number without the help of his pocket calculator.*
- calculation** – обчислення, підрахунки – e.g. *He made several mistakes in his calculations.*
7. **capacity** – об’єм, ємність, потужність, спроможність – a) the greatest amount that a container or space can hold; b) the amount that a factory or a machine can produce; c) the ability to understand or do something, e.g. *This computer has a large storage capacity.*
- The installation is operating at full capacity.*
8. **carry out** – виконувати, проводити – to do or perform something, e.g. *Students carry out lab exercises under the guidance of qualified teachers.*
9. **cope with** – впоратись – to deal with problems successfully, e.g. *Will you be able to cope with this task?*
10. **data** (pl of **datum**) – дані, інформація – facts or figures to be processed, e.g. *Computers process data at a very high speed.*
11. **device** – пристрій – a thing made or adapted for a particular purpose, e.g. *The laboratories are equipped with measuring devices.*
12. **be engaged in** – займатися – to take part in something, e.g. *Is he engaged in the work of our scientific society?*
13. **enterprise** – підприємство – plant, factory or other organization undertaking the risk of loss, e.g. *Students take their industrial training at enterprises of Lviv region.*
14. **fundamentals** – основи – basic rules or principles, e.g. *Fundamentals of Physics is one of the special subjects taught to radio engineering students.*
15. **guide** – вести, керувати – to lead, direct, supervise, e. g. *Professors and experienced teachers guide students' work on their diploma projects.*
guidance – керівництво – leadership, direction, supervision, e. g. *The laboratory experiments are carried out under the guidance of qualified teachers and laboratory assistants.*
16. **handle** - оперувати, працювати з – to deal with, to be concerned with, to treat, e.g. *Working in the laboratories, students learn how to handle modern equipment.*
17. **hardware** – апаратне забезпечення – physical units, components, integrated circuits, disks and mechanisms that make up a computer, e.g. *Computer hardware consists of a CPU (Central Processing Unit), a keyboard, a mouse and other input / output devices.*
18. **be intended for** – призначатися, бути призначеним – to be meant for, e.g. *This sensor is intended for measuring very high temperatures.*
19. **investigate** – досліджувати – to try to find out all the facts about something, e.g. *This phenomenon should be carefully investigated.*
investigation – дослідження – the process of finding out all the facts about something, e.g. *He carries out this investigation under the guidance of the head of our department.*

20. **master** – опановувати – to become completely skilled in, e. g. *We mastered the new word-processing program quite quickly.*
21. **mean (meant)** – означати, мати на увазі – a) signify; b) refer to, bear in mind, e.g.
Taking on a job during summer vacations means both earning some extra money and acquiring experience.
What does he mean by saying that?
22. **measure** – вимірювати – to find the size, extent, volume, degree etc., e. g. *You can measure the strength of electric current with a special device.*
measurement – (вимірювання) – the act or the process of finding the size, quantity or degree of something , e.g. The metric system of measurement units is used in our country.
23. **perform** – виконувати, здійснювати – to do a piece of work or something that you have been ordered to do; to work, e.g. *In this lab, students perform remote verification of various parameters of the process.*
performance – виконання, здійснення, робота – doing something, e.g. *The performance of the whole system depends on the performance of its separate parts.*
24. **process** – обробляти, опрацьовувати, піддавати аналізу – to treat, to deal with information (on a computer), e.g. *How long will it take the computer to process this amount of data?*
processing – обробка, опрацювання – the process of dealing with information, e.g. *Which part of the computer performs data processing?*
25. **provide** – забезпечувати, надавати – to give or supply something to somebody, e.g. *The Department provides students with all the facilities necessary for successful study.*
26. **purpose** – мета, ціль, призначення – a result which is desired to obtain, e. g. *To train highly qualified and creatively thinking experts is the main purpose of our university.*
27. **quantity** – величина, кількість – magnitude, value, the property of things which can be measured, e.g. *There are constant and variable quantities.*
28. **record** – записувати, запис – to preserve for use, by writing or in other ways, for example on a disc, magnetic tape, film etc., e.g. *The results of the experiment should be recorded in the journal.*
29. **simulate** – моделювати – to imitate, model, e. g. *Working on their course and diploma projects students do calculations, simulate processes and design new devices or constructions.*
simulation – моделювання – a situation in which particular conditions are created artificially in order to study something, e.g. *Simulation of production processes with the help of a computer enables engineers to find and eliminate drawbacks in these processes.*
30. **solve** – вирішувати, розв'язувати – to find an answer to a problem (question, difficulty, etc.), or a way of dealing with it, e.g. *You will have to solve technical problems of the production process.*
solution – вирішення, розв'язання – a way of solving a problem; dealing with a difficult situation; an answer, e.g. *They suggested several solutions to this problem.*

31. **software** – програмне забезпечення - programs and data used when operating a computer, e.g. *In addition to hardware a computer must have software to control and operate the hardware.*
32. **technique** – метод, спосіб – a method, a particular way of doing something, e.g. *Here students master basic experimental techniques.*
33. **transfer** – a) передавати – to move something from one place to another; b) (передача) instance of moving; conveying, e.g. *The information can be transferred by means of computer networks.*
The fourth-year students get acquainted with systems and means of data transfer and data conversion.
34. **value** – величина, цінність – a) the numerical part of a measurement of a quantity; b) quality of being useful, e.g. *The work in the laboratory will be of great value to you in your further research activity.*

Task 2.5. Revision of the essential vocabulary of the previous unit. Fill in the gaps with the proper forms of these words:

1. **apply** (застосовувати) ; **application** (застосування)
 - a) The ____ of harmful production technologies should be banned.
 - b) Here students learn how to ____ their theoretical knowledge to practice.
2. **create** (створювати) ; **creative** (творчий)
 - a) The first electronic computing machine was ____ in Kyiv in the 1950s.
 - b) Graduates of the university are both competent and ____ experts in their field.
3. **deal** (dealt, dealt) **with** (мати справу з)

These lab exercises ____ measurement of different quantities.
4. **equip** (оснащувати, обладнати, устаткувати) ; **equipment** (оснащення, обладнання, устаткування)
 - a) How many computers is this study room ____ with?
 - b) All the laboratories of the institute are provided with modern ____.
5. **install** (встановлювати) ; **installation** (установка)
 - a) You will have to ____ this program on your computer.
 - b) There are several ____ for carrying out experiments in this lab.
6. **skill** (навичка, майстерність, уміння)

In this lab students can perfect their computer ____.

Task 2.6. Complete the words to match the definitions given:

1. physical units and components that make up a computer h _r d _ _ _ _
2. leadership, direction, supervision g u _ _ a _ _ _

3. an apparatus set in position for use	<u>_</u> s t _ l <u>_</u> _ _ _ _
4. what is needed or is provided to carry out a particular purpose or function	<u>_</u> q _ _ p _ _ n t
5. smth. carried out successfully	a c _ _ e _ _ m e _ _
6. a method or a particular way of doing smth.	t e _ _ n _ _ u _
7. to move smth. from one place to another	t _ _ n _ f _
8. a result which is desired to obtain	p _ _ p _ _ _
9. to put a piece of equipment in place	i n _ _ a _ _
10. ability to do smth. expertly and well	<u>_</u> k _ _ l

Task 2.7. Match the following words and phrases with their definitions:

- | | |
|---|-------------------|
| 1. to deal with, to be concerned, to treat | a) software |
| 2. ability to hold, contain | b) capacity |
| 3. basic rules or principles | c) to provide |
| 4. to be meant for | d) to master |
| 5. to give or supply something to somebody | e) to solve |
| 6. to lead, direct, supervise | f) to handle |
| 7. programmes and data used when operating a computer | g) data |
| 8. facts, things certainly known, information | h) to guide |
| 9. to find an answer to a problem or a way of dealing with it | i) fundamentals |
| 10. to become completely skilled | j) to be intended |

Task 2.8. Match each word in Section A with one of the similar meaning in Section B:

- | A. | B. |
|---------------------|-------------------------|
| 1. to achieve | 1. to learn |
| 2. acquainted | 2. to evaluate |
| 3. to be intended | 3. aim |
| 4. to assess | 4. in relation to |
| 5. to master | 5. ability |
| 6. purpose | 6. to gain |
| 7. to be engaged in | 7. to be designed |
| 8. data | 8. familiar |
| 9. capacity | 9. information |
| 10. according to | 10. to be occupied with |

Task 2.9. Match each word in Section A with one of the opposite meaning in Section B:

- | A. | B. |
|---------------|------------|
| 1. to create | 1. to lose |
| 2. to install | 2. output |

- | | |
|------------------------------|----------------------------------|
| 3. software | 3. worthless |
| 4. to begin | 4. out-of-date |
| 5. modern | 5. to ruin |
| 6. power | 6. to dismantle |
| 7. to obtain | 7. to be indifferent about smth. |
| 8. to be interested in smth. | 8. hardware |
| 9. input | 9. weakness |
| 10. valuable | 10. to complete |

Task 2.10. Complete each sentence with a correct form of the given word using proper suffixes -ing, -ment, -ance, -ed, -or, -(c/a/t) ion, -s :

1. calculate

- a) Unfortunately, the student made several mistakes in his ____.
- b) Have you got a pocket ____?

2. solve

- a) The scientists suggested several ____ to this problem.
- b) We didn't know about his having ____ this problem.

3. perform

- a) Data transfer can be ____ by computer networks.
- b) The results of the investigation depend on the ____ of lab devices.

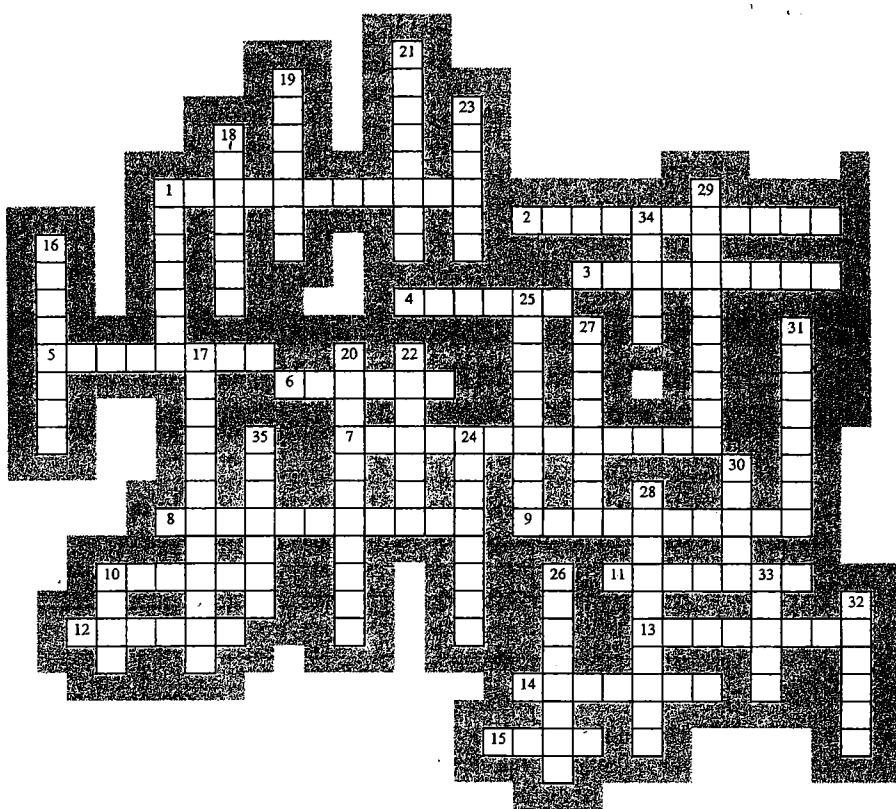
4. install

- a) We saw several ____ for verification of measuring devices in this lab.
- b) Before being ____ in the computer, the program should be checked for viruses.

5. process

- a) The function of data ____ is carried out by microchips.
- b) The Central ____ is a heart of any computing system.

Task 2.11. Do the crossword-puzzle translating the words given below into English:



Across

- виконання, здійснення, робота
- досліджувати
- обчислювати
- створювати
- передавати
- записувати
- дослідження
- вимірювання
- підприємство
- опановувати
- досягати

Down

- обробляти
- означати
- вирішення
- основи
- мета, призначення
- виконувати
- досягнення
- керівництво
- забезпечувати, надавати
- оцінювати
- програмне забезпечення

12.	оперувати, працювати з	25.	метод, спосіб
13.	моделювати	26.	ємність, потужність
14.	набувати	27.	ознайомлювати
15.	дані, інформація	28.	обробка
		29.	моделювання
		30.	вести, керувати
		31.	апаратне забезпечення
		32.	прилад
		33.	величина, цінність
		34.	вирішувати
		35.	вимірювати

SECTION III. APPLIED GRAMMAR

Task 2.12. Participles. Look through the table, read and translate the examples below it and then choose proper forms to fill in the gaps in the sentences:

	Participle I		Participle II
	Active	Passive	
Non-Perfect	<i>testing</i>	<i>being tested</i>	<i>Tested</i>
Perfect	<i>having tested</i>	<i>having been tested</i>	

- Testing the installation, the engineer found several defects in its design.
- Having tested the installation, the engineer wrote a report.
- Being still tested, this installation cannot be used in the production process.
- Having been tested two months ago, this installation is widely used in the production process.
- The engineer switched off the installation tested.

1. ____ acquainted with the instruction, the students started doing the laboratory exercise.
a) being got; b) having got; c) having been got.
2. ____ by the experienced specialist, this device measures pressure with high accuracy.
a) adjusting; b) having adjusted; c) having been adjusted.
3. ____ calculations, he made several mistakes:
a) doing; b) being done; c) having been done.
4. You should be very careful, ____ with electrical devices.
a) having dealt; b) being dealt; c) dealing.

5. The apparatus was damaged, while ___ in the study-room.
 a) having installed; b) being installed; c) installing.
6. In the laboratory he saw a group of students ___ out an experiment.
 a) carrying; b) having been carried; c) being carried.
7. ___, the information was stored in the computer.
 a) having been processed; b) having processed; c) processing.
8. ___ for measuring low temperatures, this sensor cannot be used in the high-temperature environment.
 a) intending; b) having intended; c) being intended.
9. ___ this problem, you will be able to complete your course project.
 a) being solved; b) having solved; c) solved.
10. ___ this substance, one should be careful.
 a) heated; b) having heated; c) heating.
11. The data can be ___ in table 5.
 a) finding; b) found; c) finds.
12. ___ some parts of the device, they managed to repair it.
 a) replaced; b) to replace; c) having replaced.
13. The resulting mixture was filtered under ___ pressure.
 a) reduced; b) is reduced; c) having reduced.

Task 2.13. Absolute Participle Construction.

- If the APC is at the beginning of a sentence, we introduce its translation into Ukrainian with the words “**коли**”, “**після того як**” or “**оскільки**”:
The experiment having been completed, he wrote down the results.
The apparatus being out of order, we couldn’t carry out the experiment.
- If the APC is at the end of a sentence, we introduce it with the words “**a**”, “**причому**” or without any conjunction:
The lecture is followed by a discussion, most of the students taking part in it.
- If the APC is preceded by the words “**with**” or “**without**”, the translation into Ukrainian depends on the context:
With pressure increasing, the results of the experiment will be different.
I cannot do the calculations without you providing me with all the necessary data.

1. The parameters of the process ___, he wrote them down.
 a) having defined; b) having been defined; c) defining.
2. The Department’s laboratories are equipped with modern computers, some of them ___ last year.
 a) having been installed; b) being installed; c) installing.
3. Most of my fellow students spend their holidays at home, some of them ___ on a part-time job.
 a) taken; b) taking; c) to take.

4. The problem ___, we could finish our work.
 a) solving; b) having solved; c) having been solved.

Task 2.14. Gerund. Look through the table, read and translate the examples below it and then choose proper forms to fill in the gaps in the sentences:

	Active	Passive
Non-Perfect	<i>installing</i>	<i>being installed</i>
Perfect	<i>having installed</i>	<i>having been installed</i>

- Do you mind my *installing* this program in your computer?
 - I count on his *having* already *installed* this program in our lab's computer.
 - Before *being installed* in the computer, the program should be tested for viruses.
 - I didn't know about this program's *having been installed* in our lab's computer a month ago.
1. ___ the volume of a substance changes its density.
 a) changing; b) having changed; c) being changed.
2. Her ___ this problem so quickly surprised us very much.
 a) solved; b) having solved; c) being solved.
3. Our University is interested in ___ highly qualified and experienced specialists.
 a) train; b) have trained; c) training.
4. The lab assistant counted on the students' ___ acquainted with the instruction in advance.
 a) having got; b) get; c) being got.
5. There are a lot of ways of ___ practical skills in your field of specialization.
 a) gain; b) to gain; c) gaining.
6. The students enjoy ___ in specialized laboratories.
 a) work; b) have worked; c) working.
7. We didn't know about their ___ a digital measuring device two years ago.
 a) being developed; b) develop; c) having developed.
8. The laboratories are intended for ___ the basic experimental techniques necessary for further research activity.
 a) mastering; b) master; c) to master.
9. Before ___ the computers, students listen to a course of lectures.
 a) operating; b) operate; c) having operated.
10. His ___ by this research institute is out of question.
 a) being employed; b) employed; c) having employed.

Task 2.15. Functions of “Ing”-forms in a sentence. Translate the following sentences into Ukrainian. Put questions to the underlined words.

Participle I

Gerund

1) Subject:

Measuring pressure is absolutely necessary in this experiment.

1) Part of the Predicate:

He is controlling the process now.
She has been carrying out this experiment since 9 a.m.

2) Part of the Complex Object:

In the lab we saw a student operating a computer.

3) Attribute:

At this university working students may attend lectures on Saturdays.

The students working on their course projects are allowed to use laboratory computers.

4) Adverbial Modifier:

(When) handling modern equipment, one gets acquainted with the way it works.

Having assessed students' knowledge, the teacher informed them about the results.

2) Part of the Predicate:

The purpose of the device is controlling the process.

3) Object:

The results of our work depend on her providing us with necessary data.

4) Attribute:

They got acquainted with different measuring techniques.

Here they study different techniques of measuring temperature.

5) Adverbial Modifier:

Before leaving the lab, he switched off the computer.

After investigating the phenomenon, he wrote an article for a scientific journal.

Task 2.16. Make up sentences with Gerund using the verbs and expressions given in sections A and B,

e.g., *This lab assistant was responsible for installing a new computer in the laboratory.*

A

1. to be responsible for;
2. to count on;
3. to suggest;
4. to mind;
5. to depend on;
6. to involve somebody in;
7. to be capable of;
8. to pay attention to; .
9. to take part in;
10. to be interested in.

B

1. to install a new computer in the lab;
2. to cope with the task as soon as possible;
3. to verify the performance of the installation;
4. to be engaged in the development of this device;
5. to do calculations in time;
6. to carry out research work;
7. to handle this equipment;
8. to master this programming language;
9. to solve this problem;
10. to acquire practical experience.

Task 2.17. Match the following parts of the sentences to form logical statements:

1. He is responsible
2. Information can be transferred
3. Having brought the journal,
4. Working in a chemical laboratory,
5. Having been made 20 years ago,
6. Doing calculations,

- a) without checking it up.
- b) for providing computers with software.
- c) students get acquainted with software.
- d) through computer networks.
- e) students use pocket calculators.
- f) using personal computers.

7. Students work on their course projects, g) this machine is outdated.
 8. While handling computer hardware, h) he filled it in.
 9. You cannot use this equipment i) one must observe the rules.

Task 2.18. Work in pairs. Make up sentences using the appropriate word or phrase from each column.

I He She We You They	saw watched noticed observed heard found	them us her me him you	performing their lab work. entering the laboratory. giving instructions to students. working with complicated apparatus. learning how to handle new equipment.
I He She We You They	was were	seen watched observed noticed heard	reading instructions of the experiment to be made. studying the pressure measuring devices. writing down the results of calculations made. describing installations. calculating out experiments.
I He She We You They	had will have want got	my his her their our your	calculations done. diploma project checked. data recorded on a compact disk. laboratories equipped with computers. lab exercises done. files recorded on a floppy disk.
The task being very difficult The laboratories being equipped with computers The expected results obtained Knowledge being power The computer having been repaired			he decided to ask for help. we had to learn how to handle them. she wanted to inform her colleagues about it. we should benefit from this power. we designed a new device with the help of CAD programs.

Task 2.19. Complete the following mini-dialogues using proper forms of the verbs given in brackets:

1. A: Oh, I'm so nervous. Tomorrow we are to work in a specialized laboratory, but I have no experience in (to do) lab exercises.

B: Don't worry. It's easy. Before (to carry out) an experiment, you should read the instructions carefully. After (to complete) the experiment, every student must write a

report. And you will have no problems with it; if you don't forget (to take) notes during the experiment.

2. C: Do you know anything about the computing hardware (to use) in your laboratory?

D: Yes, of course. Recently our lab (to equip) with IBM computers. (To have) huge memory capacity and (to operate) at a high processor speed, they are of great help to us in our educational, scientific and research work.

3. E: Do your students work with CAD (Computer-Aided Design) or use traditional methods while (to design) new devices in the students' construction bureau?

F: Well, drawings (not to disappear) totally from the design process, but most of the work (to do) with the help of computers.

Task 2.20. Choose the correct translation.

1. Закінчивши роботу, студенти аналізують отримані результати.
 - A. Having completed the work, students analyse the results obtained.
 - B. Completing the work, students analyse the results obtained.
 - C. To complete the work, students analyse the results obtained.
2. Оцінювання роботи студентів за допомогою комп'ютерів дає об'єктивні результати.
 - A. To evaluate students' performance by computers gives objective results.
 - B. Evaluating students' performance by computers gives objective results.
 - C. Being evaluated by computers students' performance gives objective results.
3. Поєднуючи практичні та теоретичні знання, ви досягнете великих результатів у майбутній дослідній роботі.
 - A. Combining practical training and theoretical knowledge, you will achieve great results in your further research activity.
 - B. To combine practical training and theoretical knowledge, you will achieve great results in your further research activity.
 - C. Combined practical training and theoretical knowledge, you will achieve great results in your further research activity.
4. Працюючи у хімічній лабораторії, будьте обережними, оскільки деякі речовини є шкідливі або вибухові.
 - A. To work in a chemical laboratory, be very careful because some substances are harmful or explosive.
 - B. Working in a chemical laboratory, be very careful because some substances are harmful or explosive.
 - C. Having worked in a chemical laboratory, be very careful because some substances are harmful or explosive.
5. У цій лабораторії студенти займаються обчисленням, вимірюванням та проектуванням нових пристрій.
 - A. In this lab students deal with calculating, measuring and designing new devices.
 - B. In this lab students deal with calculate, measure and design of new devices.
 - C. In this lab students deal with to calculate, measure and to design new devices.

Task 2.21. Tell your fellow-students the following facts in English:

Багато дослідників у нашій лабораторії займаються експериментальною роботою. Вони використовують сучасні методи та обладнання, широко користуються комп'ютерною технікою. До експерименту проводяться всі необхідні приготування, перевіряються пристлади, розподіляються обов'язки. Коли експеримент починається, за процесом слідкують різноманітні вимірювальні пристлади. Результати вимірювань реєструються регулярно. Метою будь-якого експерименту є проведення вимірювань та презентація результатів у вигляді чисел. Коли експеримент закінчено, аналізуються одержані дані та робляться висновки. Минув час наукових відкриттів за допомогою інтуїції. Сьогодні необхідно провести сотні складних експериментів, щоб відкрити щось нове.

Task 2.22. Rearrange the following jumbled words and phrases to form sentences:

1. The experiment, wrote down, he, the results obtained, having completed.
2. Is a place, experimental study, of science, laboratory, of different branches, intended for.
3. Our department, there are, laboratories, at, many, equipped with computers.
4. A wide range of devices, the laboratory, necessary for, has, scientific investigations, carrying out.
5. To perfect, work in the laboratory, helps, their, students, in special, knowledge, subjects.

Task 2.23. Put questions to the underlined words:

1. Yesterday we were shown the laboratory of organic chemistry.
2. The new sort of steel is being tested by the engineer.
3. The experiments have shown to us that the gas is inflammable.
4. The flame of the burner can be regulated by means of a tap.
5. They heated the substance by means of a Bunsen burner.
6. The new lab consists of several rooms.
7. Every working place is fitted with a Bunsen burner.
8. The analytical balance must be kept in a glass case.
9. You will see a great variety of apparatus if you visit this laboratory.
10. All the questions had been answered by the end of the lecture.
11. A barometer measures air pressure.

SECTION IV. DEVELOPING SPEAKING SKILLS

Task 2.24. Read the safety rules for those who work in a chemical laboratory and speak about what you must do and what you are forbidden to do there:

- Always wear eye or face protection when carrying out practical work.
- Always handle flammable liquids such as ethanol and propane with great care and keep them away from naked flame.
- Always use a boiling tube when heating a non-flammable liquid over a Bunsen flame and shake very gently during heating.
- Never point a test tube containing chemicals which you are heating towards yourself or anyone else.
- Always report accidents, spills, breakage, however small, to your teacher.
- Always make sure chemicals are labeled and use those you need.
- Always work steadily and without undue haste.
- Always pipette liquids with a safety filter.
- Always wear a laboratory coat whenever possible, make sure it is fastened and not flapping open.
- Always wash your hands after practical work.
- Never put your head or clothes near a Bunsen flame. Long hair should be tied back.
- Never wear open-toed sandals in the laboratory.
- Never smell gases directly – only very cautiously and with your lungs already filled with air.
- Never put your thumb or finger over the end of a test tube when shaking. Stopper the tube with a cork or bung.
- Never try to force glass tubing when putting it into, or removing it from corks or bungs.
- Never hold bottles by the neck. If a stopper is tight, get help. Do not try to force it off.
- Never remove chemicals or equipment from the laboratory.
- Never do practical work alone.
- Never perform unauthorized experiments.
- Never taste anything unless instructed to do so.
- Never eat, drink or apply cosmetics in the laboratory.

Task 2.25. Act out the dialogue, employing interpreters from your group:

AT A CHEMICAL LABORATORY

Students: Good morning! We are going to perform three lab exercises in your chemical lab on Friday. Will you tell us a few words about certain procedures to which we must conform while working there.

Lab assistant: With pleasure! As you see our chemical lab is modern and well-equipped. First of all, you should get acquainted with the safety regulations within the laboratory. You will know, for instance, that access to the lab is conditioned upon wearing safety glasses and a lab coat.

S: I've heard that lab coats should be cleaned and fastened, shouldn't they?

LA: You are quite right, besides, they must be worn all the time in the lab. Now note the position of fire blankets and the fire extinguisher (вогнегасник) in the lab.

S: Will you show us the nearest escape route and assembly point in the event of evacuation?

LA: Certainly. It is this way, please. Now look at our apparatus. Take particular care handling delicate apparatus such as thermometers, glass electrodes etc. which are easily broken when their glass bulbs come into contact with other surfaces.

S: Well, I know that many organic solvents are extremely flammable.

LA: Yes, it's really so. That's why you must be very careful while heating them. Besides, you should inform about any accidents or spillage either the technician or lab assistant (demonstrator) immediately.

S: At school our teacher of chemistry always asked us not to pipette solutions directly from reagent bottles. Was he right?

LA: Oh, for sure. You should always pour solutions into a beaker (мензурка) first, otherwise they can become contaminated. Besides, dispose of chemicals in the prescribed manner – Do not simply wash them down the sink!

S: It's clear, and what are we required to do at the end of the experiment?

LA: First of all you must return all the mobile apparatus to the appropriate cupboard and solution reagent bottles to the shelf above the cupboard. Bear in mind that you must leave your bench clean and tidy. You should always remember that while working in our lab you are responsible for the health and safety of other students and staff.

S: Thank you very much for your instruction.

LA: You are welcome. Good bye.

Task 2.26. Read the dialogue between two persons, laboratory assistant Roman from our university (A) and student Robert Johnson from abroad (B). Make up your own dialogues using variations.

A: Are you busy now, Robert?

B: No. Why?

A: Then follow me, please. I'll show you our laboratory of Heat Treatment of Metals./ the Thermal Engineering Laboratory/ the Laboratory of Radio Location.

B: Where is it?/ Is it far from here?

A: It is housed in an old building just behind the main building. It occupies two big rooms./ It is in the mechanical building / near the main building.

B: Is it well equipped?/ What equipment is there?

A: Yes, it is. The laboratory is furnished with up-to-date devices, instruments and other installations. The main equipment of the laboratory comprises electric resistance furnaces, thermoregulators and other facilities./ It serves as a central heating plant./ It is a perfectly equipped laboratory.

B: Oh, there are students here. What assignment are they working on now?/ What are they investigating?

A: They are dealing with heat treatment, such process as hardening. Here you can see instruments for determining hardness./ They learn to handle some new devices.

B: What device is it?/ Do they work without any assistance?

A: It is a radio-engineering device for measuring distances./ They usually work by themselves. But if a problem arises, they can ask the experienced laboratory assistant to help them.

B: Oh, you have a very good laboratory. I'm sure your students are eager to work here. Thank you for the excursion.

Task 2.27. Describe one of your lab experiments in a laboratory of your department.

Task 2.28. Role-play: work in groups of two persons, one playing the role of a reporter from a local newspaper, the other – that of a student or staff member of your department. Read your role-card and prepare for your interview carefully.

Reporter's role-card

You are to write an article about one of the departments of the university. Try to get information about different laboratories of the department, equipment and students research work. Don't forget to put down any comments that might make suitable quotes in your story.

Staff member's role-card

Present your department in a good light. Convince the reporter that students are provided with excellent conditions for studying here, have up-to-date laboratories with all necessary equipment and fulfil very interesting research programs. Invite the reporter to visit the labs.

Student's role-card

Tell about your work in labs of the department. Compare lab facilities at the university and those at school.

Task 2.29. Discuss the following questions:

1. Do you agree or disagree with the following statement? Students should attend lectures, but their work at special laboratories is not that important. Why?
2. Do you agree or disagree with the following statement? Students should carry out experiments by themselves. They do not need any guidance. Why?
3. It has recently been announced that a new research laboratory may be built in your neighbourhood. Do you support or oppose this plan? Why?
4. Do you approve of carrying out medical experiments on animals? Why?
5. What is your attitude to conducting military experiments in the Earth's atmosphere or in space?

SECTION V. READING AND WRITING**Task 2.30. Match the English word combinations with their Ukrainian equivalents:**

- A.
1. industrial enterprise; 2. processing speed; 3. data transfer; 4. description of installations; 5. computer-aided design; 6. further research activity; 7. relevant; 8. floppy disk; 9. harmful or explosive substances; 10. measuring devices; 11. Read-Only-Memory (ROM) // Random-Access-Memory (RAM); 12. laboratory assistant; 13. input/output devices; 14. prompts on the screen.

B.

 1. вимірювальні прилади, 2. швидкісні або вибухонебезпечні речовини, 3. постійна//оперативна пам'ять, 4. доречний (відповідний), 5. підказки на екрані, 6. промислове підприємство, 7. передача даних(інформації), 8. пристрой вводу/виводу, 9. автоматизоване проектування, 10. подальша дослідна діяльність, 11. опис установок, 12. швидкість опрацювання, 13. дискета, 14. лаборант.

Task 2.31. Read the text, divide it into sections, discuss each section in small groups and present the results in the form of an interview:**WORK IN LABORATORIES**

There is an old proverb "Practice makes perfect" which means that an experienced specialist is able to cope with any task. To train such highly-qualified, skilled and creatively thinking specialists is the main purpose of our university. That is why the profound study of theory should be accompanied by practical training. There exist many ways of gaining practical skills in your field of specialization, while you are still studying for a degree. In most cases, practical training begins with the work in laboratories of the university and is completed at industrial enterprises of Lviv and Lviv

region. Besides, you may participate in the work of students' construction bureaux or take some relevant job during your summer vacations. But even if you don't feel like working in summer, you are sure to acquire the necessary practical experience in specialized laboratories during the academic year.

There is a number of general laboratories in our university intended for practical work of students of all specialities, for example, the laboratories of physics and chemistry. In physics laboratories students investigate certain physical phenomena; carry out exercises in mechanics, optics, and molecular physics; measure electrical (voltage, frequency, resistance) and non-electrical (temperature, pressure, dimensions) quantities. One should be especially careful while working in chemical laboratories, because some substances are harmful or explosive.

Besides, each department of the university is provided with its own laboratory facilities, so that students could acquire skills according to the speciality chosen. Some laboratories are equipped with various apparatuses and measuring devices, while in others, computers of different generations are installed. The work in the laboratories enables students to (1) assess the practical value of their knowledge, (2) master the basic experimental techniques necessary for their further research activity, (3) learn how to handle modern equipment, (4) independently find solution to problems that arise in the process of work, and (5) analyse the results obtained. The laboratory experiments are carried out under the guidance of qualified teachers and in the presence of laboratory assistants. Before performing a laboratory work, students get acquainted with the instruction which contains the description of installations to be used and presents the order in which the lab exercise should be done and other useful information. After completing the work, students write down and analyse the results.

All the Departments of the university have laboratories equipped with computers, including Pentium computers with huge memory capacity and high processing speed. Before operating the computers, students listen to a course of lectures on means of data transfer, study fundamentals of computing techniques and programming. In these laboratories students are engaged in different kinds of activity. They learn how to handle computer hardware (keyboard, mouse and other input/output devices) and get acquainted with computer software. The lab exercises are given to students either as printed worksheets or in the form of files recorded on floppy disks. The answers are pre-programmed, and the students' performance is evaluated automatically by computers. Besides, students may use the laboratory computers while working on their course and diploma projects: they do calculations, simulate processes and design new devices or constructions with the help of CAD (Computer-Aided Design) programs. If students need some additional information on the latest achievements in their field of study, they may use compact disks with Read-Only-Memory (CD ROM) or they may look for it in the Internet. The installed software is easy to use, and system prompts on the screen will help students to find the site in the Internet they are interested in.

So, English philosopher Francis Bacon was absolutely right, when he uttered his famous statement "Knowledge is power". But you will never benefit from this power, unless you apply your theoretical knowledge to practice.

Task 2.32. Read the text and answer the questions below it:

LABORATORY OF PRECISION DEVICES AND MEASURING INSTRUMENTS

Fine mechanisms and precision instruments have been known to people for ages. In the preceding centuries most of them were designed and produced by craftsmen. Although watches have been manufactured industrially since the middle of the nineteenth century, it was only in the 20th century that the industrial production of different fine mechanisms and precision instruments was started. Their production on a commercial scale gave rise to the scientific approach to their design and the need for highly qualified specialists in this branch of industry. Engineers and designers of precision mechanics are trained at our University. In the course of their training students study such special subjects as: instruments of precision mechanics, machine parts, strength of materials, electrical measurement of mechanical quantities etc. The syllabus is designed to provide the highest quality, up-to-date training and experience possible. The students of the senior courses benefit from the work at the Laboratory of Precision Devices and Measuring Instruments. Current research is centred on:

1. error control at precision weighing;
2. grading of thermocouple;
3. fatigue testing of spring material,
4. speed testing of air flow;
5. analysis of taxi en route performance by taximeter readings;
6. measuring of resistance using analogue and digital instruments;
7. studying of effects which can be utilized to provide reliable electrical measuring instruments;
8. drawing a circuit diagram for electrical energy measuring instruments;
9. taking up characteristics of internal combustion engine performance.

The laboratory has a wide range of devices necessary for research on designing and improving measuring instruments, as well as other items of test equipment.

Students study two types of instruments: analogue and digital. An analogue instrument, while measuring different quantities, indicates their value by the movement of a pointer across the face of a scale. A digital instrument gives a display on a screen in a set of numbers. Both types are portable, accurate and widely used, but digital instruments need a power supply, while analogue ones usually do not. The choice of the instrument depends on the value to be measured. Students use different types of instruments while carrying out the research.

In lab exercises dealing with determination of error at weighing, students use analytical balance of VA-200 type. It is an equal-arm balance for weighing quantities below 200g. Systematic and accidental errors are unavoidable at weighing as they happen due to structural peculiarities of the balance. Accidental errors depend on many causes such as: temperature, vibrations, early or late readouts etc. The aim of the work carried out by the students is to eliminate all possible errors.

While grading thermocouples, students compare the reading of the thermocouple tested with the reading of a mercurial thermometer.

The study of measuring devices is connected with research in automotive design and manufacture. Students work with taximeters used for automatic readout of the sum to be paid by a passenger, tachometers used for measuring rotation speed, accelerometers, pressure transducers etc.

They also study measuring instruments designed for:

- 1) length measurement (dial gauges and micro-indicators) ;
- 2) time and velocity measurement (various types of clocks and watches, speedometers, revolution counters) ;
- 3) optical surveying and laboratory measurement (theodolites, polarimeters) ;
- 4) flow measurement (aircraft speedometers, tachometers etc.) ;
- 5) pressure measurement;
- 6) temperature measurement;
- 7) volume measurement (gas meters, water meters, petrol flow meters etc.).

Extensive research and development work has also been conducted in the technology of treatment of many special materials required for the development and manufacture of instruments for scientific and industrial use.

Work in the laboratory helps students to perfect their knowledge in special subjects, gives them an excellent start to their research and prepares them for future careers.

Questions:

1. Since when have watches been manufactured industrially?
2. What gave rise to the need for scientific approach to the design of precision instruments?
3. What special subjects do the students of precision mechanics study?
4. What do students of senior courses do at the laboratory of precision devices and measuring instruments?
5. How does an analogue instrument indicate values?
6. What does the choice of an instrument depend on?
7. What device is used to determine errors at weighing?
8. How is grading of thermocouple done?
9. What measuring instruments do students become acquainted with at the laboratory?

Task 2.33. Quiz. Choose the answers that suit you, calculate your score total and read the comments:

1. **What do you usually do before carrying out laboratory exercises?**
 - a) You look through the notes taken by you at lectures and read the instruction carefully.
 - b) You contemplate how to occupy the seat in the lab near the best student of your group. He is sure to help those who are in trouble.
 - c) You listen to your favourite songs on the player or talk with your friends about the last or next disco-party.
2. **What do you do in the laboratory of physics?**

a) You carry out experiments according to instructions: measure different values, investigate physical phenomena, learn how to handle various devices. And you never forget to observe safety rules.

b) Doing lab exercises is boring. You are not going to work in a lab after graduating from the university. So why should you acquire such skills?

c) You've heard something of AC/DC. And for an hour or so, you may be quite interested in what will happen if you connect these two wires to metal parts of the lab furniture and switch on the power or if you hit this lens with a heavy object or if you unscrew some bolts in this installation while it is still plugged in.

3. What do you do in a chemistry laboratory?

a) Strictly observing safety rules, you carry out experiments according to instructions and write down everything you observe during your work. If some problem arises, you ask the laboratory assistant for help.

b) You eat a sandwich or an apple and watch your friend carrying out an experiment. Thank God, he is good at chemistry.

c) You mix all available liquids in a flask and heat the mixture over the flame of a Bunsen burner. Before leaving the lab, you put some powder into your pocket, because when lit with a match-stick it bursts into bright sparkles. It is sure to be a great success at the next disco-party.

4. What do you do in a computer laboratory?

a) You like operating a computer, and do your best to perfect your computer skills.

b) You sit at a safe distance from the computer somewhere behind your fellow-students and don't understand what is going on on the screen. But it doesn't matter much to you. Let others ruin their eyesight and get exposed to electromagnetic radiation.

c) Even if you are not allowed to play computer games (your favourite pastime) copied on your floppy disc (infested with viruses), you will have enough time to delete data or type something funny in most of the files in the lab computer.

5. What do you do after completing a laboratory exercise?

a) You do calculations, analyse the results and write a report.

b) You copy your friend's report.

c) What?! Should you work again? It's high time to relax after the hard day.

Give 3 points for every "a", 2 points for every "b", and 1 point for every "c". If the sum total is from 15 to 12: If your answers correspond to reality, we believe that you will become a highly-qualified and experienced specialist.

from 11 to 8: In English, your characteristics sound a little bit like a disease: "lazy-bones". May be it is a disease which should be cured somehow. If all people were exactly like you, mankind would stay in the Stone Age, and there wouldn't be anybody around to invent even a wheel.

from 7 to 5: If you are still alive, tell us please about the condition the lab facilities of your higher school are in, after the prolonged exposure to your destructive activities.

APPENDIX. KEYS TO THE TASKS

Key to tasks 2.2 and 2.3:

THE LABORATORIES OF THE DEPARTMENT OF PHYSICS

The laboratories of the Department of Physics are among the first laboratories the students get acquainted with during their studies. They are situated in the main building of the University. There are three of them: Laboratory of Molecular Physics, Electrical Laboratory and Optical Laboratory.

In the Laboratory of Molecular Physics students carry out a number of laboratory exercises in mechanics and molecular physics. These exercises illustrate the laws of motion of material objects, principles of mechanical interactions between objects, the laws of vibratory motion. Properties of gases, vapours, liquids and thermal properties of solids are also studied in this laboratory.

In another laboratory, the electrical one, students study practically the properties of conductors, semiconductors and insulators, the basic laws of electrostatics, the laws describing current flow in separate conductors and in electric circuits, electromagnetic phenomena and the laws of electrolysis.

In Optical Laboratory, students carry out experiments which help them to practically study the laws of geometrical optics and different phenomena connected with the wave nature of light and quantum nature of light (e. g., interference, diffraction, photo-effect). Here they also do some assignments on the investigation of the structure of atom.

Using their knowledge of general laws of physics, students determine moduli of elasticity of different substances, thermal conductivity coefficients, electric field strength, specific resistance, dielectric and magnetic constants of different substances, light wave length etc. Students use modern standard instrumentation. They are: analytical balances, manometers, electromagnetic oscillators, ac (alternating current) and dc (direct current) generators, modern precise digital instruments, interferometers, lasers etc.

A thorough fulfilment of laboratory tasks in the Laboratories of the Department of Physics lays the foundation for further successful work when students begin to work in their special laboratories.

UNIT 3. UKRAINIAN NAMES IN WORLD SCIENCE

Task 3.1. Talk with your fellow-students about:

1. Famous Ukrainian writers, artists, composers and scientists.
2. Ukrainian scientists who left their native land.
3. Scientists who worked at our university.
4. The prospects of the development of Ukrainian science.
5. The achievements in the field of science you study.
6. Famous British or American scientists.

Task 3.2. Discuss the following questions:

1. Imagine that you are a gifted young scientist. What problem would you like to investigate?
2. If you were an inventor, what would your efforts be aimed at? What kind of invention would you like to make?
3. What are the most essential qualities of a good scientist?
4. What do you consider to be the most important science? Why?
5. It is common knowledge that society benefits from the activity of its members. Compare the contribution of artists to the society with that of scientists. Whose contribution do you think is more valuable (is more appreciated by our society)?

SECTION I. AURAL COMPREHENSION

Task 3.3. You are going to hear five pieces of information each accompanied by a small assignment. Listen to the information and do the assignments.

Task 3.3.1. Decide whether the statement is true or false:

- (a) Heorhiy Vorony was a mathematician.
- (b) All his papers were of great significance.
- (c) Heorhiy Vorony was born in Poltava region.
- (d) After finishing gymnasium he entered Warsaw University.

Task 3.3.2. Fill in the gaps:

- (a) The name of Myron Zarytsky, ..., gifted and inspired pedagogue is very little known in Ukraine.
- (b) Myron Zarytsky entered ... and continued his studies at Lviv University.
- (c) In Lviv he gained his ... and wrote about 20 scientific works.
- (d) His activity at Lviv University, ... was intense and interesting.

Task 3.3.3. Correct the following false statements:

- (a) Mykhailo Kravchuk's research works promoted the development of the first nuclear bomb.
- (b) He died at the age of 80.
- (c) The name of Mykhailo Kravchuk was well known in Ukraine.
- (d) M.Kravchuk became an associate professor at the age of 33.

Task 3.3.4. Complete the following sentences:

- (a) The founder of mathematical culture in Ukraine, Volodymyr Levytsky was the first to write his scientific papers
- (b) V. Levytsky collected and compiled Ukrainian terminology dictionary in mathematics and physics, which
- (c) His articles were written in many languages: Ukrainian,

Task 3.3.5. Answer the following questions:

- (a) Where and when was M.Ostrohradsky born?
- (b) Who insisted on M.Ostrohradsky's entering Kharkiv University?
- (c) What did Mykhailo do in Paris?
- (d) How many works devoted to different branches of mathematics did he write?

SECTION II. USE OF THE ESSENTIAL VOCABULARY**Task 3.4. Memorize the essential vocabulary and translate the sentences containing it:**

1. **appreciate** – високо цінувати – to be grateful for; judge rightly the value of; understand and enjoy, e.g. *You can't properly appreciate the contribution of Ukrainian scientists into the world science, unless you study their scientific heritage.*
appreciation – висока оцінка, розуміння - proper understanding and recognition, e.g. *Scientific heritage of our prominent countrymen deserves appreciation.*
2. **award** – нагороджувати - to give as a prize, reward or judgement, e.g. *Hryhoriy Sharpak was awarded the Nobel Prize in 1992 for the design of a nuclear particle detector.*

3. **benefit** – отримувати користь - to do good to; to receive help or profit, e.g. *World science has benefited greatly from the contribution made by Ukrainian scholars, researchers and inventors.*
benefit – користь, вигода, прибуток - help, profit, e.g. *Other countries have derived benefit from the inventions and discoveries made by Ukrainians.*
4. **claim one's right to** – заявити про свої права на щось - demand recognition that one has a right to, e.g. *Ivan Puluy couldn't claim his right to the discovery of invisible X-rays as he had not published the results of his investigation.*
5. **consider** – вважати, розглядати - think about; be of the opinion, regard as, e.g. *Yuriy Kotermak (Drohobych) is considered to be one of the first Ukrainians to have paved the way into the world science.*
6. **countryman** – земляк - compatriot, e.g. *We are proud of our prominent countrymen.*
7. **contribute** – робити внесок - join with others in giving ideas, help, money etc., e.g. *Ukrainian scientists have contributed invaluable ideas to nearly all fields of science and engineering.*
contribution – внесок - act of contributing, e.g. *Tsiolkovsky made a great contribution to the development of space engineering.*
8. **decide** – вирішити - come to a conclusion; make up one's mind, e.g. *After getting acquainted with Tsiolkovsky's works, Serhiy Koroliov decided to devote his life to space engineering.*
decisiveness – рішучість - the quality of being decisive, i.e. showing decision; definite, e.g. *Decisiveness is the main feature of his character.*
indecision – нерішучість - the state or quality of being indecisive, i.e. not decisive, indefinite, e.g. *Because of Puluy's indecision the results of his X-rays investigation were not published in their proper time.*
9. **develop** – розвивати, -ся // розробляти - a) grow or make larger or more mature; b) work out, elaborate, e.g. *In spite of numerous obstacles Ukrainian scientific societies were constantly developing their activity. Koroliov developed a number of rockets and rocket-carriers.*
development – розвиток, розробка, e.g. *The economic and cultural development of provinces of the empire was neglected. They got acquainted with the latest developments in the field of molecular physics.*
10. **devote** – присвятити - dedicate; to give (one's time, energy, etc.) to, e.g. *Many scientists devoted their lives to some investigations which led them to great discoveries.*
to be devoted – бути відданим, бути присвяченим - be very loving or loyal, e.g. *Though many Ukrainian scientists had to leave their Motherland, they were always devoted to it.*
11. **discover** – відкривати - to find out; to find by exploration; to make a discovery, e.g. *Ivan Puluy was the first to discover X-rays which are known as Roentgen's nowadays.*
discovery – відкриття - discovering; the thing discovered, e.g. *The discoveries made by Oleksandr Zasiadko, Mykola Kybalchych, Kostiantyn Tsiolkovsky are known to have paved the way into outer space.*

- 12. encourage** – заоочувати - give hope, courage or confidence to; support, e.g. *Creative activity of Ukrainian talented people was not encouraged by foreign rulers.*
- 13. enrich** – збагачувати to make rich; improve in quality, e.g. *Our prominent countrymen have enriched the world science with their brilliant ideas, inventions and knowledge.*
- 14. fruitful** – плідний - producing good results, e.g. *The end of the 19-th century was especially fruitful for the development of Ukrainian science.*
- 15. grant a patent** – видати патент - to allow to have, give a patent, e.g. *Oleksandr Smakula was granted many patents in the field of optics and laser technology.*
- 16. hold a post** – займати посаду - occupy, have the position of, e.g. *Ivan Puluy held the post of Rector at Prague Higher Technical School.*
- 17. hush up** – замовчувати - prevent from becoming public knowledge, e.g. *Many distinguished people of Ukrainian origin remain unknown up to this day, as their names were deliberately hushed up during the years of the Soviet regime.*
- 18. investigate** – досліджувати - make a careful study of, try to get more information by study or research, e.g. *In this laboratory they investigate properties of gases.*
investigation – дослідження - careful study, research, e.g. *Who will carry out the investigation of this phenomenon?*
- 19. invisible** – невидимий - that cannot be seen, e.g. *Puluy began his investigation of the invisible rays in 1877.*
- 20. legacy** – спадщина - something handed down from ancestors or predecessors, e.g. *Scientific legacy of our countrymen is really remarkable.*
- 21. outstanding/prominent** – видатний - attracting attention, distinguished or important, e.g. *Many physicists investigated semiconductors, but one of the most outstanding of them was Abraham Yoffe born in the town of Romny in Ukraine.*
- 22. particular** – особливий - special, e.g. *The Shevchenko Scientific Society has always played a particular role in the formation of young scholars' outlook.*
- 23. pay tribute** – віддавати належне - show one's respect or admiration, e.g. *We should pay tribute to the genius of Yuriy Kondratiuk who presented his theory of interplanetary space flights in 1929.*
- 24. promote** – сприяти - help the progress of something or somebody, e.g. *The political rulers of the country didn't promote scientific research at the provincial educational establishments.*
- 25. prosper** – процвітати - do well, be successful, flourish, e.g. *A lot of scholars moved to the capital of the empire where science was prospering.*
prosperity – процвітання - the state of being successful, e.g. *Industrial revolution has brought prosperity to the country.*
prosperous – що процвітає, заможний - successful, rich, flourishing, e.g. *The central regions of the empire were much more prosperous than the province.*
- 26. recognize** – визнавати - acknowledge, to accept smth/smb officially, e.g. *The scientific achievements of those scholars who refused to support the Stalinist regime, were not officially recognized.*

- recognition** – визнання - acknowledgment, e.g. *Kyrylo Synechykov (born in Dnipropetrovsk region) won wide recognition in the field of nuclear physics.*
- 27. reflect** – відображати - express, show the nature or quality of something, e.g. *Science not only reflects the level of the development of society, but also greatly influences this development.*
- 28. revive** – відроджувати, -ся - come or bring back into existence or to an earlier state, e.g. *Many national traditions have been revived in our country.*
- revival** – відродження - coming or bringing back into existence or to an earlier stage, e.g. *The proclamation of independence of Ukraine led to the revival of national self-consciousness.*
- 29. search** – пошук - looking for, e.g. *The search for new sources of energy is still going on.*
- 30. self-consciousness** – самосвідомість - awareness of one's own existence, thoughts and actions, e.g. *The revival of national self-consciousness manifested itself in ever-increasing interest of people in the national history, art and science.*
- 31. society** – суспільство, товариство - a) social community; b) organization of persons formed with a purpose; association, e.g. *Some people consider that society should fund scientific research. In the 19th century, scientific societies often organized lectures on the latest achievements of science for general public.*
- 32. success** – успіх - achieving one's aim, e.g. *Some scientists generated a lot of valuable ideas, but failed to achieve success in their implementation.*
- successful** – успішний - having success, e.g. *Serhiy Koroliov supervised a lot of successful space programs.*
- 33. versatile** – багатограничний - many-sided, e.g. *Puluy's versatile creative activity made him famous in both science and literature.*

Task 3.5. Revision of the essential vocabulary used in the previous Units. Fill in the gaps with proper forms of the words:

1. **create** (створювати); **creative** (творчий)

a) Many world-famous scientists, composers, writers and artists started their ___ activity in Ukraine.

b) Yuriy Kondratuk's idea to ___ a base round the Moon made it possible for American astronauts to land on the Moon many years after his death.

2. **ensure** (забезпечити, гарантувати)

a) Talent and tremendous work of Ukrainian scientists ___ tangible progress of mankind.

3. **invent** (винахідити); **invention** (винахід); **inventor** (винахідник)

a) He hasn't registered his ___ yet.

b) The activity of ___s should be encouraged.

c) When did Arkhyp Liulka ___ a turbo-jet engine?

4. **manage to do** (вдається / зуміти щось зробити)

a) This Ukrainian scientist ___ed to make a brilliant career abroad.

Task 3.6. Complete the words to match the definitions given:

- | | |
|---|--------------------|
| 1. to help the progress of | - ro - - te |
| 2. to give as a prize, reward or judgement | - w - - d |
| 3. to do good to; to receive help or profit | b - n' - f - - - |
| 4. social community or association | - o - - et - |
| 5. to think about; be of the opinion, regard as | c - - s - - er |
| 6. compatriot | c - - - - - ym - n |
| 7. to cause smth. to exist; make (smth. new and original) | cr - - t - |
| 8. to come to a conclusion; make up one's mind | - ec - d - |
| 9. to dedicate; to give up (one's time, energy etc.) to | - - vot - |
| 10. many-sided | v - - s - - il - |
| 11. to make rich; improve in quality | - - ri - - |
| 12. to make sure; guarantee | en - - r - |
| 13. to occupy; have (the position of) | - - - d |
| 14. to prevent from becoming public knowledge | h - - - up |

Task 3.7. Match the following phrases with their definitions:

- | | |
|----------------------------|--|
| 1. creative | (a) help, profit; |
| 2. to claim one's right to | (b) special; |
| 3. decisiveness | (c) having the quality of creating; |
| 4. particular | (d) achieving one's aim; |
| 5. success | (e) to prevent from becoming public knowledge; |
| 6. to hush up | (f) to demand recognition that one has a right to; |
| 7. to ensure | (g) the quality of being decisive; |
| 8. benefit | (h) to be grateful for; |
| 9. to be devoted | (i) to make sure, to guarantee; |

Task 3.8. Form the nouns denoting occupations using the following words and suffixes:

- “-or” – 1. invent; 2. construct; 3. investigate; 4. operate; 5. create;
 “-er” – 6. discover; 7. geography; 8. sing; 9. astronomy; 10. write; 11. research; 12. philosophy; 13. design;
 “-ist” – 14. scientific; 15. economy; 16. geology; 17. speciality; 18. physics; 19. chemistry;
 “-ian” – 20. mathematics; 21. academic; 22. history; 23. technical; 24. physic (=medicine).

Task 3.9. Fill in the gaps with proper words from the list below:

societies, contribution, granted, discovery, encourage, successful, prosperity, researcher

1. Illia Mechnykov made a great ___ to biology. 2. Roentgen was awarded the Nobel Prize for the ___ of X-rays. 3. Ivan Puluy was a prominent physicist, ___, linguist and philosopher. 4. Many scientific ___ appeared in our country in the 19th century. 5. The inventor has been ___ a patent. 6. This Ukrainian scientist made a ___ career abroad.

7. The state should ___ the work of scientists and fund their research. 8. New inventions and discoveries are regarded as a barometer of a country's economic ___.

Task 3.10. Complete the sentences with the derivatives of the given words using proper suffixes

(-or, -(t) ion, -ing, -ive, -ed) :

1. create

- a) Arkhyp Liulka was a ___ of a turbo-jet engine.
- b) The idea of ___ a base in orbit round the Moon belonged to Yuriy Kondratiuk.
- c) The ___ work of Stepan Tymoshenko in the field of mechanics resulted in publishing the manual which is still used at higher schools.

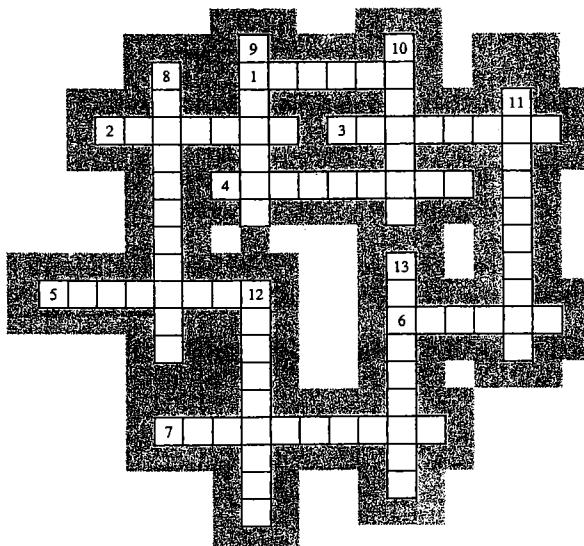
2. invent

- a) Hryhoriy Sharpak was awarded the Nobel Prize for the ___ of a new nuclear particle detector.
- b) To obtain a patent, an ___ should submit his/her application to the Patent Office.
- c) Having ___ a vacuum lamp, Puluy demonstrated it at the World Electrical-Engineering Exhibition in Paris.

3. investigate

- a) ___ the phenomenon, Puluy received photoprints by means of the invisible rays in 1883.
- b) He failed to publish the results of his ___.
- c) The scientific legacy of our prominent countrymen has not been properly ___ yet.

Task 3.11. Do the crossword puzzle using the definitions below:



Across:

1. to come or bring back into existence
2. achieving one's aim
3. producing or using new ideas
4. many-sided
5. to think about, to be of the opinion, regard
6. to invent, to produce smth.
7. compatriot

Down:

8. acknowledgement
9. to do well, to be successful, flourish
10. help, profit
11. to join with others in giving ideas, help etc.
12. to acknowledge, to accept smth/smb officially
13. to give hope, courage or confidence to

Task 3.12. Match the words in section A with their antonyms in section B:

A

1. native
2. success
3. divided
4. to create
5. famous
6. decisiveness
7. to encourage
8. to enrich
9. to appear
10. to manage to do something
11. mental
12. better
13. to appreciate
14. particular

B

1. indecision
2. unknown
3. to discourage
4. physical
5. to impoverish
6. to fail to do something
7. to disappear
8. to underestimate
9. worse
10. foreign
11. united
12. to ruin
13. failure
14. common

SECTION III. APPLIED GRAMMAR

Task 3.13. Choose the proper forms to fill in the gaps:

1. Unfavourable historic events made a lot of Ukrainians their homeland.
a) to leave; b) leave; c) to be left.
2. this engine, Arkhyp Liulka carried out a lot of experiments.
a) having been created; b) being created; c) creating.
3. She wants me a scientific report on this subject.
a) to make; b) to have been made; c) makes.
4. They knew his research successfully.
a) to have been completed; b) to complete; c) to be completing.

5. They consider him ___ an outstanding scientist.
a) was; b) is; c) to be.
6. We think his discovery ___ the world science.
a) to be enriched; b) to have enriched; c) to have been enriched.
7. ___ the experiments, he published the results.
a) completed; b) having completed; c) having been completed.
8. He is said ___ Rector of Bologna University.
a) to have been; b) was; c) be.
9. He was reported ___ his right to this discovery a month ago.
a) to have been claimed; b) to be claimed; c) to have claimed.
10. At that time he was known ___ a new nuclear particles detector.
a) designs; b) to be designing; c) to have been designed.
11. He is supposed ___ this phenomenon for ten years or so.
a) to have been investigating; b) to be investigated; c) to investigate.
12. This manual seems ___ in the 19th century.
a) to print; b) to be printed; c) to have been printed.
13. ___ in the 1940s, transistors are widely used in electronics.
a) inventing; b) having been invented; c) having invented.

Task 3.14. Choose proper forms to fill in the gaps:

1. ... the temperature we slow down the reaction.
a) to decrease; b) having decreased; c) decreasing.
2. I.Puluy is known ... linquistically gifted.
a) to be; b) being; c) to have been.
3. The experiment ... in the article attracted my attention.
a) describing; b) described; c) being described.
4. He entered the room without ... her.
a) noticed; b) noticing; c) having noticed.
5. You can't make me ... that all these stories are true.
a) to believe; b) believe; c) believing.
6. Rubber is said ... from America.
a) to have brought; b) brought; c) to have been brought.
7. ... all the exams he left for Lviv.
a) passing; b) having passed; c) being passed.
8. Some elements ... resulted in new elements.
a) combined; b) combining; c) being combined.
9. The experiment resulted in ... valuable data.
a) obtained; b) being obtained; c) obtaining.
10. The test ... in our lab is very important for our work.
a) carrying out; b) was carried out; c) carried out.

Task 3.15. Match the beginning of each sentence in column A with its ending in column B:

A

1. Because of his negligence I.Puluy postponed
2. This job involves
3. He looks forward to
4. I don't really mind
5. The scientists suggested
6. The results of this experiment need
7. His indecision prevented him from
8. We appreciate
9. His rivals resented
10. To gain breathtaking results they kept

B

- a. making thorough investigation.
- b. his being the Nobel-prize winner.
- c. working incessantly in this field.
- d. publishing the results of his scientific investigations.
- e. checking.
- f. having a new view of this question.
- g. making acquaintance with this academician.
- h. realizing his pioneer ideas.
- i. his joining my investigations.
- j. your helping us with the inquiry into this problem.

Task 3.16. Change the sentences using Complex Object and Complex Subject, e.g.

- It seems that he has done a lot in the sphere of physics.
- He seems to have done a lot in the sphere of physics.

1. It seems that this prominent scholar is our countryman.
2. It is known that the scientific activity of many Ukrainian scientists was hushed up in the Soviet period.
3. Everyone knows that I.Puluy was the first to investigate X-rays.
4. I think that the name of Kostiantyn Tsiolkovsky is familiar to everyone.
5. It is very likely that this promising scientist will manage to make a brilliant career.
6. It appears that there will be a heated discussion of this phenomenon.
7. It is proved that inventions and discoveries of Ukrainian scientists are of great pride for Ukraine.
8. We didn't expect that he would be granted a patent so soon.
9. It happened that other countries benefited from the achievements of Ukrainian scientists.
10. It is said that decisiveness leads to success.

Task 3.17. Ask and answer questions to complete the information

Student A.

K.Tsiolkovsky was born in ... (When?) in the village of Izhevsk.
He educated himself; he read, wrote verses, constructed model-balloons, a winged flying machine, etc.
When he was sixteen he began to think ... (What....about?).

Student B.

K. Tsiolkovsky was born in 1857 ... (Where?). He educated himself; ... (How?). When he was ... (How old?) he began to think of applying centrifugal force to the ascent into space, but soon he realized his mistake. In 1887 ... (What?) appeared. Tsiolkovsky was able to

<p>In 1887, his first published communication on the dirigible appeared.</p> <p>Tsiolkovsky was able to present a paper on ... (What?) in 1890.</p> <p>A popular account of his views was first published in 1895. ... (When?) he published several articles dealing with the ... (What kind of theory?) theory of rocket flight.</p> <p>His calculations showed that it would be possible to travel out into space in rockets.</p> <p>Tsiolkovsky died ... (When?).</p>	<p>present a paper on his aeronautical work to the Imperial Russian Technical Society in 1890.</p> <p>A popular account of his views was first published ... (When?). During the period 1903–1926 he published ... (How many?) articles dealing with the mathematical theory of rocket flight.</p> <p>His calculations showed ... (What?).</p> <p>... (Who?) died in 1935.</p>
--	--

Task 3.18. Translate the following sentences into Ukrainian:

A

1. The engine tested required no further improvement.
2. The plan having been discussed, the meeting was over.
3. The experiment being made in our lab shows the action of catalysts.
4. When combined with the oxygen of the air the match was lighted.
5. When translating this article the student found the description of a new element.
6. The thermometer is a measuring instrument.
7. The temperature being raised, the kinetic energy is increased.
8. Having graduated from the institute, he began to work in an office.
9. Seeing is believing.
10. He tried to find an excuse for being late.

B

1. The discovery showed the atomic nucleus to be a vast source of energy.
2. The Ukrainian scientist H. Sharpak is known to have got the Nobel Prize in 1992.
3. These two scientists happened to work on the same problems.
4. Many people like to watch the Sun rise.
5. Did you want this plan to be improved?
6. Have you ever seen Ulanova dance?
7. I. Puluy is considered to be the first to have investigated X-rays.
8. Y. Kotermak appears to have worked at Bologna University.
9. The Soviet regime made many talented Ukrainians leave their Motherland.
10. We expect our students to show good results at the next examination session.

C

1. He is fond of reading poems.
2. They are afraid of asking you about it.
3. They are afraid of being asked about it.
4. I don't remember showing this text.
5. I don't remember being shown this text.
6. We like listening to music.
7. We like being listened to.

Task 3.19. Translate the following sentences into English using the Subjective Infinitive Complex:

1. Кажуть, що багато відомих українських хіміків працювали у Львівській політехніці.
2. Відомо, що Львівська політехніка була заснована в 1844 році.
3. Мій брат, напевно, буде поступати в наш університет.
4. Вважають, що курс лекцій з хімії буде читати професор Новіков.
5. Вступні іспити, здається,

почнуться через два тижні. 6. Відомо, що 1 дюйм дорівнює 2,54 см. 7. Повідомляють, що українські вчені зробили великий внесок у розробку космічних ракет. 8. Виявляється, що М.Туган-Барановський займає посаду Міністра фінансів у Центральній Раді. 9. Маломовірно, що він приде завтра. 10. Цей метод, здається, дуже надійний.

Task 3.20. Complete the sentences using the phrases given in brackets:

1. She made ...
2. I watched ...
3. I hear ...
4. He noticed ...
5. They wanted ... (to understand him; to come to the same decision; to be a clever man; to return home; to change one's mind)

SECTION IV. DEVELOPING SPEAKING SKILLS

Task 3.21.

Role-play A. One of the students of your group acts the part of a famous Ukrainian scientist whom you have just read about in the text "Ukrainian Names in World Science". Using the active vocabulary from the text (as many new words as possible), s/he tells about his life and scientific carrier, and the class should guess his name.

Role-play B. One of the students acts as a famous Ukrainian scientist. Other students ask him at least 5 questions concerning his life, career, scientific work, etc, and try to guess what famous person the student acts. The winner is the student who guessed the name of the scientist and he is the next to continue the game.

Task 3.22. Read the dialogue and reproduce its contents:

Anna: The situation of the society's attitude to nature is grave today.

What can you say to that?

Borys: The activities of man today must match the forces of nature. V.I.Vernadsky wrote: "Mankind taken as a whole is becoming a powerful geological force. And the question arising before it, before its intellect and labour, is one of rebuilding the biosphere in the interest of humanity as a freely-thinking race".

A.: What do you know about Vernadsky?

B.: Volodymyr Ivanovich Vernadsky (1863-1945), academician, an outstanding Ukrainian scientist and naturalist was the founder of geochemistry, biochemistry and radiogeology. It was largely due to his ideas that the concept of man's absolute domination of nature gave the way to that of relations between equal partners. It was still in the 1950s that teachers of natural science lectured on the conquering of nature. Whereas Acad. Vernadsky taught that nature is not to be conquered, but rather cherished and cooperated with.

A.: What education did he get and where?

B.: V.I.Vernadsky was born in St.Petersburg in the family of Prof. I.V. Vernadsky who was a relative of the well-known writer V.H.Korolenko. In 1885 he graduated from St. Petersburg University. In the years 1898-1911 he was professor of mineralogy and crystallography at Moscow University. In this period he studied the deposits of iron ores in Kryvy Rih and later, in 1915 the natural productive resources of Ukraine and Russia.

A.: How was his career built up during the next period of his life?

B.: The Ukrainian period of his life started after 1917. With a group of scientists Vernadsky organized the Ukrainian Academy of Sciences which was established in 1919. He became its first President. The Academy included sections of historical and philological, physical and mathematical, social and economic sciences. He was one of the main founders of the State Public Library in Kyiv. Vernadsky, a prolific scientist, became the most active organizer of scientific activity.

A.: What are the details of his organizational activities ?

B.: On Vernadsky's initiative and with his most active participation important scientific institutions were organized: the State Radium Institute (1922), the Commission on the History of Knowledge (1926), the Department of Living Matter (1927) later transformed into the Biogeochemical Laboratory, and others. Academician Vernadsky enriched our science with profound ideas in modern mineralogy, geology, hydrogeology etc. His works laid the basis for the theory of the feasibility of man's transforming the biosphere into a sphere of reason, a science dealing with the interaction between nature and man. The new sphere involves a balanced relationship between man and the environment, the absence of pollution, the use of natural resources in ways harmless to nature, and the scientific management of ecosystems. Vernadsky stressed that the development of the new sphere was a common and the only intelligent way for the Earth dwellers to face their future.

A.: Was Vernadsky's activity spreading beyond the borders of Ukraine?

B.: Yes, it was. He was Academician of the Russian Academy of Sciences since 1909 and the Academy of Sciences of Ukraine since 1919. He was elected an Honorary Member of the Czechoslovak and Paris Academies of Sciences, many domestic and foreign scientific societies.

A.: What about keeping memory about the scientist now?

B.: The scientist's merits are highly appreciated now. An avenue in Kyiv was named after him in 1973, where a monument to the great scientist was erected in 1981. The Central Scientific Library in Kyiv bears his name.

Task 3.23. Read the dialogue between two students sharing information about Vasyl Milianchuk, a famous theoretical physicist. Give an oral summary of the information it contains.

Ihor: Hello, Oleh! Haven't seen you for ages. How are you getting on?

Oleh: I feel very well, thank you. I'm delighted to see you. But you look seedy. What happened to you?

- I.: Well, all last week I was ill. I had quinsy but now I'm recovering. And what about you? What are you so happy with?
- O.: You know, it is the first time I'm so proud of myself. I have just finished a report to be presented before my classmates. It is the best report I have ever made. There is no doubt about it. I've learned a huge amount of material on this topic.
- I.: Excellent! I'm extremely glad for you. By the way, what does your report deal with?
- O.: It is about V.Milianchuk, one of the most famous physicists. Do you know anything about him.
- I.: Of course, I've heard this name before. Our teacher of physics told us about him, but very little. I know that the name of V. Milianchuk is associated with the scientific school of the field quantum theory.
- O.: Moreover, it was he who founded that school.
- I.: He seems to have been born in Lviv and educated at Kyiv University.
- O.: I can't agree with you. As far as I know, V.Milianchuk was born in a village near Kolomyia (Ivano-Frankivsk region) and he got his education at the Mathematics and Natural Sciences Faculty of Lviv I. Franko University and at the Faculty of Physics of Lviv Polytechnic Institute. I have it on good authority. Shame on you, my dear friend. He was our countryman and it is our duty to know about his life and activity. I can't endure the thought that my generation doesn't know anything about such a famous person.
- I.: You are quite right. It is clear as a day. What interesting things you are speaking about! Would you mind telling me something more about him?
- O.: Willingly. I have got some spare time. What are you interested in?
- L.: I'd like to know where he worked.
- O.: Well, Vasyl Milianchuk worked at the Department of Theoretical Physics of I. Franko University where he gained the Doctor's degree of Philosophy a couple of years later. World War II ruined his creative plans. But after the war he was engaged in the revival of physical science at Lviv University. In 1946 he was appointed Head of the Department of Physics.
- I.: By the way, I've just remembered our teacher told us that V.Milianchuk had held a post of professor.
- O.: Quite right. He successfully defended his doctorate thesis in the field of atomic spectroscopy in 1957.
- I.: Is he still alive?
- O.: Oh, no. Exactly one year later, in 1958, V.Milianchuk died. His life was not very long but it was very fruitful. He was among the most outstanding theoretical physicists who trained many famous scholars.
- I.: Thank you very much for such interesting information. You are an excellent narrator. I see that you can tell much about this person. But it will be better for me to read your report and then express my opinion.
- O.: It would be great.
- I.: Good bye! I'll call you later.
- O.: O.K. Good luck!

to have smth on good authority – знати щось з авторитетного джерела

I can't endure the thought that ... – не можу примиритися з думкою

Task 3.24. The following statements relate to the information presented in Sections IV and V. Do you agree, disagree or partially agree with the statements? Express your agreement and disagreement using some of the following phrases:

Agreement	Partial agreement	Disagreement
That's right.	I suppose so, but ...	I can't agree with you.
Of course.	I'm not certain ...	I have to disagree.
I totally agree...	I agree to some extent, but ...	I don't really think so.
There's no doubt...	That's true, but ...	That's most unlikely ... Nonsense! Nothing of the kind! Of course not!

1. V.Vernadsky became the first President of the Ukrainian Academy of Sciences which was established in 1919.
2. The whole life of V.Milianchuk was devoted to music.
3. Dmytro Rozhansky belonged to the constellation of the greatest physicists of Ukraine.
4. K.Tsiolkovsky was the author of many important works in the field of aerodynamics and rocket engineering.
5. The author of more than 50 scientific works, I. Puluy was the first to begin the investigation of invisible X-rays and the first Ukrainian to be awarded the Nobel Prize.
6. The Ukrainian land has always been rich in talents, however, until recently their names have not been associated with Ukraine.
7. Under the supervision of Yevhen Paton, the technology and apparatuses for automatic assembly welding were developed.
8. The Central Scientific Library in Lviv bears the name of V.Vernadsky.
9. The first academic centers appeared in Ukraine in the 16th and 17th centuries, among them: Ostroh College (1576), Kyiv-Mohyla Academy (1632) and Lviv Technical College (1661).
10. Ukrainian scientists were given good opportunities for fruitful and creative activities in the Soviet period.

Task 3.25. Write down 5–10 questions you would like to ask (or to be asked) about prominent countrymen. Then choose a partner and ask each other questions. Begin some of your questions with the following phrases:

Could you tell me ...?

Do you know ...?

Do you happen to know ...?

Is it true that ...?

I've heard that Is it really so?
Could you explain why/ where/ what ...?
What do you think about ...?

SECTION V. READING AND WRITING

Task 3.26. Read the text, make its outline and discuss it with your fellow-students:

UKRAINIAN NAMES IN WORLD SCIENCE

Science is considered to be the highest form of human mental activity that reflects the development of nature, society and thinking. Each nation is proud of its scholars, researchers and inventors, because their work not only promotes the economic prosperity of the country, but also ensures the progress of mankind. The Ukrainian land has always been rich in talents, and the contribution of our countrymen to the world science and culture can hardly be exaggerated. However, until recently their names have not been associated with Ukraine. The tragic fate of our country, divided and enslaved for many centuries, made a lot of Ukrainians leave their homeland, as foreign rulers were indifferent to the development of the province and didn't encourage the work of scientists. Moreover, a lot of Ukrainian scientists are known to have been repressed in the Soviet period, as, for example, geographer Stepan Rudnytsky (1877–1937). Their scientific work was ignored, and their names were deliberately hushed up. As a result, other countries have benefited from the inventions and discoveries made by Ukrainians, while very little is known about them in Ukraine. On the other hand, those scientists of Ukrainian origin who did win the recognition in their Motherland (e.g. Volodymyr Vernadsky, Kostiantyn Tsiolkovsky, Serhiy Koroliov), are world-famous as Russian or Soviet scientists.

One of the earliest-known Ukrainian names in the world of science is that of Yuriy Drohobych-Kotermak (1450–1494) who, like many of the prominent people of the Renaissance, was named after his native land. Having obtained education at the universities of Poland and Italy, Yuriy Kotermak became famous all over Europe as a physician, philosopher, astronomer, and poet. His creative activity was highly appreciated by Bologna University where he held the post of Rector.

The first academic centers appeared in Ukraine in the 16th and 17th centuries, among them: Ostroh College (1576), Kyiv-Mohyla Academy (1632) and Lviv University (1661). These educational establishments trained specialists both in humanities and natural sciences. The end of the 19th century was especially fruitful for

the development of the Ukrainian science. Numerous scientific societies, including Lviv Scientific Society named after Taras Shevchenko, were of particular importance, as they managed to create a proper atmosphere for training scholars devoted to their Motherland. Nevertheless, a lot of scientists had to go abroad in search for better conditions for their work. For example, Ivan Puluy (1845–1918), born in Ternopil region, is considered to have been one of the greatest scientists of the Austro-Hungarian Empire. Having gained the degree of Doctor of Philosophy at Vienna University, Ivan Puluy became Rector of Prague Higher Technical School. The author of more than 50 scientific works, he was the first to begin the investigation of invisible X-rays as early as 1877. But because of his indecision, the researcher didn't publish the results of his work and couldn't claim his right to the discovery. So, Wilhelm Roentgen who started investigating the rays in 1885, won all the fame and was awarded the Nobel Prize. The creative activity of Ivan Puluy was extremely versatile: he invented cathode-ray tubes, vacuum tubes and greatly contributed to the development of telephone networks, miners' lamps and neon signs. Being linguistically gifted, Ivan Puluy worked successfully on the translation of the Bible into his native Ukrainian language.

One can hardly find a field of knowledge which has not been enriched by the many-sided activity of Ukrainian scientists. For example, Ukraine is represented in the field of mathematics by such outstanding mathematicians as Mykhailo Ostrohradsky (1801–1861), the author of works on mathematical analysis, analytical mechanics and hydromechanics; Heorhiy Vorony (1868–1908) who developed the theory of numbers; Volodymyr Levytsky (1872–1956) and Mykola Chaikovsky (1887–1970) who were educated and fruitfully worked in Lviv.

In the sphere of physics a great deal was done by Vasyl Milianchuk (1905 – 1958) who concentrated on the spectrum analysis, quantum theory and electrodynamics; Alexander Smakula (1900–1983) born in Ternopil region, professor of the universities of Germany and the USA, was granted many patents in the field of optics and laser technology; Ostap Stasiv (1903–1985) who was educated in Lviv and worked as a professor at Dresden University for 20 years, carrying out research in solid-state physics; Mykola Pylchykov whose extensive research dealt with the problems of optics, Earth's magnetism and radioactivity; Hryhoriy Sharpak who got the Nobel Prize in 1992 for the design of nuclear particle detectors. Invaluable contribution was made by Ukrainian physicists Kostiantyn Tsiolkovsky, Serhiy Koroliov, Arkhyp Liulka, Yuriy Kondratuk and Ihor Sikorsky into the development of aircraft and space-rockets construction.

One of the well-known Ukrainian names in the field of civil engineering and mechanics is that of Stepan Tymoshenko (1878–1972) who was born in Chernihiv region. He made a successful career in Germany and the USA, carrying out research into strength of materials.

A lot of famous chemists worked at Lviv Polytechnic, among them: Roman Zalozetsky (1861–1918), famous for his research into the technology of oil, and Tymophiy Yurzhenko who developed methods of production of organic peroxides.

In economics Ukraine is represented by an outstanding economist Mykhailo Tuhan-Baranovsky (1865–1919) who held the post of Minister of Finance in the Central Rada.

It was only in the 1990s, due to the revival of national self-consciousness, that historians of independent Ukraine began to study the scientific legacy of our prominent countrymen. So, it is high time to both pay tribute to their genius and to use their brilliant ideas and inventions for the benefit of our Motherland.

Task 3.27. Rearrange the following jumbled words to form sentences:

1. human, highest, is, form, the, science, of, activity, mental;
2. land, been, rich, talents, Ukrainian, in, the, always, has;
3. countrymen, the, science, hardly, contribution, our, the, of, into, world, can, exaggerated, be;
4. of, science, for, of, end, the, fruitful, the, century, 19-th, was, development, especially, Ukrainian, the;
5. created, for, societies, scholars, scientific, the, training, proper, devoted, their, atmosphere, to, Motherland;
6. abroad, for, in, many, had, scientists, to, search, go, conditions, work, for, better, their;
7. independent, began, historians, Ukraine, of, scientific, to study, our, of, prominent, heritage, countrymen;
8. to pay, it, time, is, tribute, high, genius, their, to.

Task 3.28. Read the texts and present their contents in the form of interviews:

Text 1. THE CONTRIBUTION OF UKRAINIAN SCIENTISTS TO THE DEVELOPMENT OF ROCKET AND SPACE ENGINEERING

Speaking about the development of rocket and space engineering, we usually associate it with the name of Academician Serhiy Koroliov. But let us first recollect the names of his predecessors. First, let us mention Alexander Zasiadko (1779–1838), a descendant* of the glorious Cossack family, who was born in Poltava region. His grandfather used to tell him stories about special pipes stuffed with gun powder, which flew to distant targets and exploded causing great damage. Alexander was so impressed by the stories, that he decided to find out the secret of those Cossack pipes. Two years after his retirement from the army Zasiadko succeeded in developing the first models of combat rockets, as well as a special installation for their launching. During the Russian-Turkish war of 1828–1829 Alexander Zasiadko's rockets were used in action.

Kostiantyn Tsiolkovsky (1857–1935) is said to have been a descendant of the famous Cossack leader Severyn Nalyvaiko. Tsiolkovsky was the author of many important works in the field of aerodynamics and rocket engineering. Two very important contributions were offered by Tsiolkovsky: the notion of multi-stage rockets and the idea of using liquid hydrogen and liquid oxygen as fuel for rockets.

Serhiy Koroliov not only studied Tsiolkovsky's works, but also had personal contacts with him, which stimulated his fundamental research into space engineering. Serhiy Koroliov (1907–1966) was born in Zhytomyr. After finishing a vocational school in Odessa, he entered the Mechanical Department of Kyiv Polytechnical Institute, but later transferred to Moscow Higher Technical College. Koroliov developed a number of rockets and rocket-carriers. He was a leading designer of many space systems and trained a lot of scientists and engineers.

Another famous name in this field of science is that of Yuriy Kondratuk. It was an assumed name of Olexander Sharhei (1897–1942), who tried to avoid repressions for his participation in the anti-Soviet struggle. In his book "The Conquest of Interplanetary Space", published in 1929, the scientist presented calculations which were used by Americans forty years later for launching their spaceship "Apollo" to the Moon. By the way, two other Ukrainians took part in the implementation** of the "Apollo" flight programme. They were Mykhailo Yarymovych (b.1933) and Ihor Bohachevsky (born in 1928 in Lviv region). Yarymovych was appointed technical director for the designing of an orbital laboratory from which a space rocket could be launched to the Moon. And Bohachevsky considerably helped Americans to solve complicated problems connected with astronauts' return from the Moon to the Earth.

So these facts prove that Ukrainian scientists have done a great deal for space exploration. And our sacred duty is to know the names of our countrymen who enhanced the glory of Ukraine in the field of scientific research and technological progress.

* descendant – нащадок,

** implementation – здійснення, виконання.

Adapted from "News From Ukraine"

Text 2. UKRAINIAN PHYSICISTS

The development of physics, one of the fundamental natural sciences, has always played a vital role in the progress of mankind, Ukrainian physicists having greatly contributed to it. However, in the former USSR the science of Ukraine was not recognized at the world level. It was associated only with Soviet or Russian science. For instance, few people know that Academician Petro Kapitsa (1894–1984) was of Ukrainian origin. The main fields of his scientific research were magnetism, physics of plasma and physics of low temperatures. It was for fundamental research in this latter field, that Petro Kapitsa was awarded the Nobel Prize in 1978.

Another famous physicist Volodymyr Linnyk (1889–1984) was born in Kharkiv and graduated from Kyiv University. He worked out a number of methods in the field of applied physical optics and designed various devices for observation of astronomical objects.

Dmytro Rozhansky (1882–1936) was born in Kyiv. After graduating from St Petersburg University, he worked in the Electrotechnical Institute under the guidance of Alexander Popov. Later Dmytro Rozhansky founded a special school for radiophysicists in Kharkiv. Here he worked on the development of short-wave transmitters*, and carried out research into characteristic distinction of the propagation** of ultra-short radio-

waves. Dmytro Rozhansky was one of the first to start the work on the development of radar (a special installation for radio-location).

One should also mention the Patons, father and son, both of them being Presidents of the Academy of Sciences of Ukraine. Yevhen Paton (1870–1953) devoted his works to bridge construction and automation of welding processes. Under his supervision, the technology and apparatuses for automatic assembly welding*** were developed. Borys Paton was born in Kyiv in 1918, and graduated from Kyiv Polytechnic Institute. He also worked in the field of electric welding and special electric metallurgy. Following the initiative of Academician Borys Paton, a wide network of experimental enterprises (pilot plants) was established by the Academy of Sciences of Ukraine in the 1960s in our country. These scientific and technological complexes proved efficient in solving many complicated problems and facilitating the industrial application of scientific inventions and developments.

*short-wave transmitter – коротко-хвильовий передавач,

**characteristic distinction of propagation – особливості поширення,

***assembly welding – монтажне зварювання.

Text 3. O. SMAKULA

O. Smakula is a world known Ukrainian scientist. He was born on the 9th of September 1900 in the village of Dobrovody, Zbarazh district, Ternopil region. Still at school, he took great interest in natural sciences and in foreign languages. In 1922 he finished the course of studies in Ternopil gymnasium and left for Germany where he became a student of Gettingen University, a famous scientific centre of that time. Such prominent physicists as V. Heizenberg, N. Bohr and R. Pol worked at the University at that time.

In 1927 O.Smakula obtained the Doctor of Philosophy degree. Working at the Physical Institute in Gettingen, he sent many of his articles to be published in the Proceedings of the Mathematics and Natural Sciences Section of T.Shevchenko Scientific Society in Lviv, thus developing physical science in Ukraine. The end of the 1920s is known to be the period of establishing the fundamental physical theory, quantum mechanics.

O. Smakula actively participated in the seminars organised by V. Heizenberg and M. Born, the founders of quantum mechanics. He was one of the first scientists who used the concepts of quantum mechanics to study the mechanisms of interaction of electromagnetic radiation with solids. In 1930 he published his scientific paper in which concepts and parameters of quantum oscillators were used to describe the crystal radiation colouring in terms of qualitative mathematical relation known as the Smakula formula. This formula is known all over the world over and it is referred to in all textbooks and monographs.

From 1930 till 1934 O. Smakula headed the Optical Laboratory of the research institute in Heidelberg, working on the problems of optics and crystal spectroscopy. In 1951 O. Smakula was invited to the USA and offered a professorship at Massathusets Technological Institute, where he organized and headed the laboratory of crystal physics in

1964. At the Institute O. Smakula created a powerful scientific school which is famous for its topical research in the field of solid state electronics. He carried out investigations in technology and properties of electro-optical materials and optical communication in atmosphere; thin films, secondary electron emission, new non-linear and semiconductor crystals. Professor Smakula is the author of more than 100 important scientific papers and holder of many patents widely used by scientists in the world.

Text 4. OUTSTANDING UKRAINIAN ARCHITECTS

Yulian Octavian Zakharievych was a professor of Lviv Technical Academy. He founded his own architectural school, whose representatives further became professors of the Building Department. Among them were Theodor Talyovsky, Ivan Zubrytsky, Oleksandr Biborsky, Tadeush Obminsky and others. Yulian Zakharievych became famous for his designs of such monumental buildings as the main building of Lviv Polytechnic, Halytsky Savings Bank, Industrial Museum etc. Besides the afore mentioned designs, he was the author of different architectural projects in Vilno, Berezhany, Zarichchia and other towns. The first catalogue of the works of art appeared in 1885–1888 on his own initiative.

Theodor Talyovsky (1857–1910) is regarded to have been the master of Neo-Gothic style. Having graduated from Lviv Polytechnic College, he started his architectural practice in Krakiv: designing both dwelling houses and sacred constructions. In 1901 he was appointed professor of Lviv Polytechnic. We can see Th.Talyovsky's buildings in many places of the former "Kingdoms of Halytchyna and Lodomoriya". They are shaping the appearance of a number of small towns near Lviv.

Vasyl and Yevhen Nahirny, father and son, were Galician architects. Vasyl Nahirny is considered to have founded a new national style in sacred building. In 1871 he entered Lviv Polytechnic, but later left for Zurich. After graduating from Zurich Polytechnic, he worked in Switzerland for eleven years. Later he returned to Lviv where he designed churches. His works number 200 churches. His son Yevhen (1885–1951) was a gifted follower of his father. He graduated from Lviv Polytechnic where he was trained by Prof. I. Levynsky. He was the author of 400 various projects, the large majority of which were implemented. After World War II he worked as an inspector-architect and wrote a book dedicated to the architecture of Lviv and Lviv region.

Tadeush Obminsky (1874–1932, Lviv) graduated from the Architectural Department of Lviv Polytechnic College in 1898. Later he worked as a laboratory assistant, a teacher and professor. From that time on he closely collaborated with Ivan Levynsky's factory, one of the biggest building companies in Halytchyna. His creative technique was based on the synthesis of contemporary building methods and traditions of wooden architecture. As a researcher he introduced the most essential features of the folk art into civil engineering. Among his most interesting works we should mention "People's Hotel", Sknyliv aircraft hangars, the Library of Lviv Polytechnic etc.

Vladyslav Horodetsky (1863–1930) was Polish by birth and Ukrainian by spirit. His name is shrouded in legends. He was born in the village of Sholud'ky in Podillya (now Vinnytsia region). He graduated from St. Petersburg Imperial Academy of Arts (architectural department) in 1890. He was a talented hard-working person. His most famous structures were built in 1889–1902. They are National Art Museum, St. Nicholas Roman Catholic Cathedral, two buildings of Russian Insurance Agency in Khreshchatyk (not extant). The peak of his creative activity was the construction of his private house at 10, Bankova Str. (Kyiv), the so-called “The House with Chimeras” which was built in 1903. The building became famous due to the design of the facade and interior which was decorated with the odd sculptures made by his friends Elio and Eugenio Sala. The majority of the sculptures were called into being by the 39-year-old architect's fantasy. The others were caused by his passion for hunting. The House has become a model of the early modern architecture in Kyiv and the best advertisement for cement application both as building and plastic material for decorating facades. Cement was not popular at that time and it was given gratis for his construction.

There was a legend that this fantastic House was built as a sign of grief for his daughter who had drowned. But that is not true: his daughter Helena lived in Kyiv a long and happy life. Among the common legends was the mass-media canard* about the restoration of the House as the presidential residence. In 2000 Vladyslav Horodetsky was nominated the “Architect of the Century” title.

* canard – безглазда чутка; газетна витадка

(Adapted from “Building Otherwise/Будуємо інакше”.

№ 4,5,6, 2000; № 2, 2001;

<http://www.library.com/publications/2003/...>)

SECTION VI. EXTENDED READING

Task 3.29. Read the text and render it into Ukrainian:

Text 1. MYKHAILO TUHAN-BARANOVSKY

Mykhailo Tuhan-Baranovsky was born on January 8, 1865 in the village of Soliane, in the province of Kharkiv in Ukraine. On graduating from the Faculty of Physics and Mathematics at Kharkiv University (1888), he studied political economy and statistics at the Faculty of Jurisprudence at Kharkiv University, passing the master's examination, and completed his training as an economist with periods of study in St. Petersburg, Paris (1889), Moscow and London (1892). His first work “A Study of the Marginal Utility of Economic Goods” (1890), and above all his doctoral dissertation

The Industrial Crises in Industrial England (1894), his masterpiece dedicated to the study of business cycles, gained him the position of assistant professor of political economy in the Faculty of Jurisprudence at St. Petersburg University (January 1895). However, Tuhan's active participation in the debates of the Third Section of the Imperial Free Economic Society, of which he became director in 1896, and the editorial writings of the "Legal Marxists" of St. Petersburg led to the suspension of his nomination by the minister of public education until December 1905.

His fundamental work "The Russian Factory, Past and Present" (1898) and the subsequent translation of his major works into German, English, French and Spanish – among them, "The Theoretical Foundations of Marxism" (1905) and "Modern Socialism in its Historical Development" (1906) – made Tuhan "the most eminent" Slav economist of that period, and "the most important figure of international theoretical revisionism". From 1905 onwards, finally distancing himself from Marxism, Tuhan worked with the daily newspaper of Russian cadets "Rech" and was recalled to the Faculty of Jurisprudence at St. Petersburg University as assistant professor. In 1913 he was appointed to the Chair of Political Economy. In spite of the merit of his teaching and scientific research, culminating in his "Foundations of Political Economy" (1909), a new veto by the minister forced him to resign, and from 1913 to 1917, he worked at the Department of Economics of the Imperial Polytechnic Institute in St. Petersburg.

Gradually coming to share the aspirations, ideals and political programmes of the Ukrainian national and cooperative movement – his "Social Foundations of Cooperation" was published in 1916 – Tuhan left Petrograd for Kyiv in the summer of 1917; in August 1917 he took up the post of the Minister of Finance in the General Secretariat of the Ukrainian Central Rada, representing the Ukrainian Party of the Socialist Federalists. In 1918 he became Head and organizer of the Ukrainian Academy's Third (Socio-Economic) Department and of the Institute for the Study of Cycles attached to the Academy. Sent as an economic adviser with the Ukrainian delegation to the Paris Peace Conference on January 8, 1919, he died on a train at the railroad station in Oradne between Kyiv and Odesa.

*(Taken from Selected Contributions of Ukrainian Scholars to Economics
by I.S. Koropecky, published by Harvard Ukrainian Research Institute, 1984)*

Text 2. ROALD HOFFMANN

Roald Hoffmann was born in 1937 in Zloczow, Poland (now Zolochiv, Ukraine). He immigrated to the United States with his family in 1949. He graduated from Columbia University (1958) and received his Ph.D. from Harvard University in 1962. He collaborated with Robert B. Woodward at Harvard during the next three years and then joined the Cornell University faculty in 1965.

Roald Hoffmann has made numerous contributions in the field of chemistry, most notably in the area of geometrical structure and reactivity of molecules. His contributions have earned him numerous honours, including the 1981 Nobel Prize in

Chemistry shared with Kenichi Fukui (Japan). Hoffmann and his collaborator, R. B. Woodward, developed the Woodward-Hoffmann rules governing the course of certain chemical reactions based on the electronic structures of the reactants. Hoffmann undertook the research leading to his share of the prize when he and Woodward sought an explanation of the unexpected course taken by a reaction that Woodward and his colleagues had hoped to use in the synthesis of the complicated molecule of vitamin B. Hoffmann and Woodward discovered that many reactions involving the formation or breaking of rings of atoms take courses that depend on an identifiable symmetry in the mathematical descriptions of the molecular orbitals that undergo the most change. Their theory, expressed in a set of statements now called the Woodward-Hoffmann rules, accounts for the failure of certain cyclic compounds to form from apparently appropriate starting materials, though others are readily produced; it also clarifies the geometric arrangement of the atoms in the products formed when the rings in cyclic compounds are broken.

In addition to sharing the Nobel Prize, the American Chemical Society has honoured him with the Priestley Medal, the Arthur C. Cope Award in Organic Chemistry, and the American Chemical Society Award in Inorganic Chemistry. He received also Pimentel Award in Chemical Education, Award in Pure Chemistry, Monsanto Award, National Medal of Science. Hoffmann is currently professor of chemistry at Cornell University, focusing in the area of applied theoretical chemistry.

Roald Hoffmann has been very active in communicating science to non-scientists, and he is also an accomplished poet and writer. He published two scientific-popular books: *Chemistry Imagined: Reflections on Science* (1993) and *The Same and Not the Same* (1995). In 1993, Hoffmann hosted a 26-segment television documentary on the Public Broadcasting Service entitled *The World of Chemistry*.

Roald Hoffmann became a prominent member of the Polish Institute of Arts and Sciences of America.

Text 3. HERBERT BROWN. NOBEL PRIZE IN CHEMISTRY (1979).

Autobiography

My parents, Charles Brovarnik and Pearl Gorinstein, were born in Zhytomyr in Ukraine and came to London in 1908 as part of the vast Jewish immigration in the early part of this century. They were married in London. In 1909 my sister, Ann, was born. I arrived on May 22, 1912. In June 1914 my father decided to join his mother and father and other members of his family in Chicago, much to the dismay of my mother, whose own family largely remained in England. My grandfather's name had been anglicized to Brown, and that became our name. In the United States, my two sisters, Sophie and Riva, were born in 1916 and 1918.

My father had been trained as a cabinet maker, doing delicate inlaid work. However, he found little market for his skills in the U.S. and turned to carpentry. We lived in an apartment above the store and I attended the Haven School at Wabash and

16th Street with predominantly black classmates. I did well in school and was advanced several times, graduating at 12. Indeed, I was offered, but refused, further advancement since I did not want to be in the same class with my sister, Ann.

On graduation, I went to Englewood High School on the South Side of Chicago. Unfortunately, my father became ill of some sort of infection and died in 1926. I left school to work in our store. I am afraid that I was not really interested in the business and spent most of my time reading. My mother finally decided that she would attend to the store and I should go back to school. Accordingly, I reentered Englewood in February 1929 and graduated in 1930. At Englewood I ran the humor column of the school paper and won a national prize.

We sold the store at that time. I had no hope of going on to college. However, this was the beginning of the Depression and I could find no permanent job. Studying appealed to me much more than the odd jobs I could find. I decided to go to college. I entered college intending to major in electrical engineering. I had heard that one could make a good living in that area. However, I took chemistry and became fascinated with that subject, and remained with chemistry thereafter. I had just completed one semester at Crane Junior College when it was announced in 1933 that the school was to be closed for lack of funds. I then went to night school at the Lewis Institute, taking one or two courses, financing myself by working as a part time shoe clerk.

I then heard that one of the instructors at Crane, Dr. Nicholas Cheronis, had opened his laboratory to several students, so that they could continue their studies on their own. I went there and grew to know and love a fellow student, Sarah Baylen. Sarah had been the brightest student in chemistry at Crane prior to my arrival. She has described ("Remembering HCB") how she initially "hated my guts." But since she could not beat me, she later decided to join me, to my everlasting delight.

In 1934 Wright Junior College opened its doors. We went there and nine of us graduated in 1935 as the first graduating class. In my yearbook Sarah predicted that I would be a Nobel Laureate!

I entered the University of Chicago in the fall (autumn) of 1935, accompanied by my girlfriend, Sarah. This was the time when the President of the University, Robert Maynard Hutchins, was arguing for the principle that students should be permitted to proceed as rapidly as possible. Indeed, at that time it cost no more to take ten courses than it did the usual three. I did so, and completed my junior and senior year in three quarters, receiving the BSc in 1936.

I received my Ph.D. in 1938. Unfortunately (perhaps fortunately), I could not find an industrial position. Professor M.S. Kharasch then offered me a position as a postdoctorate at a stipend of \$1600 and my academic career was initiated. The following year Professor Schlesinger invited me to become his research assistant with the rank of instructor. Consequently, I am an unusual example of a chemist who ended up in academic work because he could not find an industrial position.,

At that time one did not achieve tenure until after ten years. I had seen a number of individuals who had remained at Chicago as instructors for nine years without tenure

and then had to find another position under severe pressure. I decided to avoid this situation. Accordingly, after four years I asked Professor Schlesinger for a decision as to my future in the Department. When he came back with the word that there was no future, I undertook to find another position.

Fortunately, Morris Kharasch had a good friend, Neil Gordon, the originator of the Gordon Research Conferences, who had given Morris Kharasch his first position at the University of Maryland back in 1920.) Neil Gordon was persuaded to give me a position at Wayne as Assistant Professor, preserving my academic career. I became Associate Professor in 1946, and was invited to Purdue in 1947 by the Head of the Chemistry Department, Henry B. Hass, as Professor of Inorganic Chemistry. In 1959 I became Wetherill Distinguished Professor and in 1960 Wetherill Research Professor. I became Emeritus in 1978, but continue to work with a large group of postdoctorates.

Originally my research covered physical, organic and inorganic chemistry and I took students in all three areas. However, as the Department became more organized into divisions, it became necessary to make a choice, and I elected to work primarily with coworkers in organic chemistry. In addition to my research program in the borane-organoborane area, my research program has involved the study of steric effects, the development of quantitative methods to determine steric strains, the examination of the chemical effects of steric strains, the non-classical ion problem, the basic properties of aromatic hydrocarbons, a quantitative theory of aromatic substitution, and the development of a set of electrophilic substitution constants, s_+ , which correlate aromatic substitution data and a wide variety of electrophilic reactions.

(Adapted from the Internet material)

APPENDIX. KEYS TO THE TASKS

Key to task 3.3.1.

Heorhiy Vorony is widely known as one of the most talented mathematicians in the theory of numbers on the verge of the 19th – 20th centuries. The scientist managed to publish only 12 papers during his lifetime but each one was so important that it gave impulse to the development of new branches in mathematics.

Heorhiy Vorony was born in Poltava region in 1868. After finishing gymnasium he entered St. Petersburg University where he mastered mathematics and physics, and cherished a dream of his own discoveries. On receiving his Master's degree Heorhiy Vorony was appointed to work in Warsaw University as professor of mathematics.

Key to task 3.3.2.

The name of Myron Zarytsky, a brilliant mathematician, gifted and inspired educator is very little known in Ukraine. He was born into the family of a priest, in Ternopil region in 1889.

Myron Zarytsky entered Vienna University and continued his studies at Lviv University. In Lviv the notable mathematician became a member of the Scientific Society named after T.Shevchenko. In Lviv he gained his Doctor of Philosophy degree and wrote about 20 scientific works. His activity at Lviv University, Lviv Polytechnic Institute and Uzhhorod University was intense and interesting.

Key to task 3.3.3.

Mykhailo Kravchuk is the author of over 180 works, among them 10 books are dedicated to different branches of mathematics. These research works enriched the world science and promoted the development of the first computer. The name of M.Kravchuk is well-known and world-famous in scientific community but nobody knew he was a Ukrainian. Full of energy, creative projects and intentions M. Kravchuk was exiled to Kolyma (Siberia) and he died before he was 50. His name was hushed up in Ukraine.

M. Kravchuk was born in Volyn', in 1892. Being a man of extraordinary intelligence and culture, he became an associate professor at the age of 25; at 33 a member of the All-Ukrainian Academy of Sciences. M. Kravchuk worked in Kyiv University and maintained scientific and personal contacts with prominent mathematicians of the world.

Key to task 3.3.4.

The founder of mathematical culture in Ukraine, Volodymyr Levytsky was the first to write his scientific papers in his native language. He was the first to unite mathematicians of Ukrainian origin for carrying out research.

V. Levytsky collected and compiled a Ukrainian terminology dictionary in mathematics and physics, which was published in 1903. Scientific interests of V. Levytsky were wide and versatile: algebra, geometry, the history of mathematics, physics and astronomy. All his research and public activity was connected with the Scientific Society named after T.Shevchenko in Lviv, which he headed in 1932-1934. His articles were written in many languages: Ukrainian, Polish, German, French, Spanish and English.

Key to task 3.3.5.

Mykhailo Ostrohradsky deserves one of the most distinguished places in the history of the world mathematics. An outstanding talent, sharp intelligence, penetrating mind, high mathematical erudition, knowledge of modern natural sciences helped M. Ostrohradsky to make first-rate discoveries in many branches of mathematics and mechanics.

M.Ostrohradsky was born in Poltava region in 1801. His life was very interesting and difficult. As a young man M.Ostrohradsky wanted to become a military man. Yet, his uncle insisted on Mykhailo's entering Kharkiv University. The University of Kharkiv, six years in Paris, where M.Ostrohradsky attended lectures of famous mathematicians; gave excellent results. The scientist wrote about 50 works devoted to different branches of mathematics and mechanics. He was acquainted with I. Kotliarevsky, T. Shevchenko, S. Hulak-Artemovsky, M. Lysenko and M. Maksymovych.

Key to task 3.17.

TSIOLKOVSKY AS A FOUNDER OF ASTRONAUTICS

Kostiantyn Eduardovich Tsiolkovsky was born on September 5, 1857, in the village of Izhevsk, in Ryazan' province. When he was ten he contracted scarlet fever; although he recovered he was left permanently deaf. This was to have a great influence on the subsequent course of his life. He educated himself; he read; he wrote verses; he constructed model-balloons, a winged flying machine, a carriage driven by a steam turbine etc.

When he was sixteen he began to think of applying centrifugal force to the ascent into space, but soon he realized his mistake. This experience made him aware of the gaps in his knowledge and he began to study higher mathematics. He actually became a mathematics and physics teacher.

Tsiolkovsky carried out experiments on steam engines for a time, but then he returned to the theoretical study of the metallic dirigible. In 1887, his first published communication on the dirigible appeared.

Tsiolkovsky was able to present a paper on his aeronautical work to the Imperial Russian Technical Society in 1890; he also submitted a model of a dirigible. The account of his work was eventually submitted to the Imperial Academy of Sciences.

Meanwhile he had not given up his ideas about space travel. A popular account of his views on this subject was first published in 1895.

During the next quarter of a century, Tsiolkovsky brought out various other designs for rocket propelled spaceships.

During the period 1903–1926 he published several articles and books dealing with the mathematical theory of rocket flights and space travel. His calculations showed that it would be perfectly possible to travel out into space in rockets and even to set up manned space stations around the Earth.

Tsiolkovsky died in 1935.

UNIT 4. STUDENTS' RESEARCH WORK

Task 4.1. Discuss the following questions in small groups and then report the conclusions of your discussion to a larger group.

1. What do you know about research work in general and students' research work, in particular?
2. How important, do you think, is research work for higher educational institutions and for professional development of students – future specialists in different fields of science and engineering?
3. Do you personally have any experience of doing research (at school, university)? If so, in what field of science are you particularly interested in?
4. Have you heard of any discoveries or inventions associated with professors and researchers of Lviv Polytechnic National University?
5. Do you think that all students of universities are involved in research work in this or that way? Explain your answer.
6. What kind of research work, to your mind, can students do at the Department of Foreign Languages of a technical university?
7. How can proficiency in a foreign language help students, postgraduates and other people involved in research achieve better results in their specialist research?

SECTION I. AURAL COMPREHENSION

Pre-listening exercises

Task 4.2. The text you are going to listen to is about communication skills. How important, to your mind, are such skills for people in general and for technical professionals, in particular? Do you think they are of any value in research work?

Task 4.3. Check whether you can pronounce the following international words and word combinations correctly. Translate them.

Engineer, primary, technical communication, technical person, technical project, professional, critical, client, ultimate product, interests, document, practicing, industry, organization, sponsor, perspective, real, to maximize chances, to progress, career.

Task 4.4. Check whether you can pronounce correctly and whether you remember the meaning of the following words and word combinations. They will help you in understanding the text.

To convince, coworkers, unnoticed, unappreciated, essential, success, successful, teamwork, tools, handy, promotion, hiring, to gain, entire, superfluous, survival, environment, worth.

Task 4.5. Study the following phrases. They will help you in understanding the text.

In a word – словом; from the perspective – з точки зору; to pursue subjects – здійматися предметами; to land a good job – відшукати добру роботу; this is not the case – але це не так; to progress through career – робити успіхи у професійній кар’єрі; to do well at – добиватися успіху в чомусь.

Task 4.6. Listen to the text and answer the following questions:

1. Why does it seem that writing and communication are superfluous to technical education?
2. What skills, according to the text, do scientists and engineers need to convince coworkers and clients of their worth?
3. What do communication skills mean for technical people?
4. How is good teamwork related to good communication?
5. In what form is the ultimate product of technical professionals' work usually presented?
6. How important are communication skills as tools of success?
7. What should you do to maximize your chances for landing a good job and doing well at it?
8. Where can you apply your technical and professional communication skills?

Task 4.7. Listen to the text again and fill in the gaps with the missing words:

In fact, this is not the case. Scientists and _____ may be technically brilliant and _____, but unless they can convince coworkers, clients, and _____ of their worth, their _____ will be unnoticed, _____, and unused. In a word, if technical people cannot _____ what they are doing and why it is important, it is

they and their _____ technical skills that will be superfluous. From this perspective, communication skills are not just handy; they are _____ for success, even survival, in “real world” _____.

Task 4.8. Listen to the text again and then select the most accurate statement in each case:

1. a) Writing and aural communication are superfluous to a technical education.
b) Writing is more important than aural communication to technical professionals.
c) Both writing and aural communication skills are essential in technical education.
2. a) Good teamwork is impossible without good communication.
b) Good teamwork is possible without good communication.
c) Good individual work is impossible without good communication.
3. For many technical professionals the ultimate product of their work is
a) an aural agreement.
b) a written document.
c) improved communication skills.
4. a) A badly written document means that the person has got good communication skills.
b) A badly written document creates bad reputation to the entire organization.
c) A badly written document doesn’t affect the reputation of the organization at all.
5. a) They recommend you to work on your communication skills even if they are pretty good.
b) There is no need to work on your communication skills if they are good.
c) You should not try to improve your communication skills to land a good job.

Task 4.9. Listen to the text again and mark the following statements as “true” or “false”:

1. Communication skills are critical tools for success in real world environments.
2. A technical professional has no gains from improving his or her communication skills.
3. Most scientists and engineers work in organizational settings where teamwork is essential.
4. Good teamwork is possible without good communication.
5. Organizations never base their hiring and promotion decisions on the applicant’s writing ability.
6. For many technical professionals, the ultimate product of their work is a written document.
7. A badly written document hardly ever reflects badly on the entire organization.
8. The better your communication skills are, the more chances you have to be promoted.

SECTION II. USE OF THE ESSENTIAL VOCABULARY.

Task 4.10. Memorize the essential vocabulary and translate the sentences containing it:

1. **abstract** – анотація, тези доповіді – a short written statement of the most important ideas in a speech, article etc. e.g. *Participants of scientific conferences are usually expected to submit abstracts of their papers in advance.*
2. **acquire** – набувати (знання, навички, досвід), одержувати – to learn or develop knowledge, skills by your own efforts, e.g. *Making presentations at the students' scientific conferences helps students acquire and perfect their communication skills.*
acquisition – набуття, одержання
3. **annual** – щорічний – happening once a year, e.g. *The Department of Foreign Languages organises annual students' conferences on urgent issues of science, engineering and humanities, the papers being presented in foreign languages.*
annually – щорічно
4. **arrange** – організовувати – to organise or make plans for smth. such as a meeting, party etc.,
e.g. *Annual students' scientific conferences arranged by the Department of Foreign Languages are very popular with the students of our University.*
arrangement – організація, домовленість, договір
5. **basics** – основи – fundamentals, the most important and necessary facts about something from which other possibilities and ideas may develop,
e.g. *Students learn basics of research work while working on their course papers.*
6. **carry out (on)** – виконувати, проводити – to do something that needs to be organised and planned, e.g. *A graduation paper is a small research project carried out by the student under the guidance of a supervisor.*
7. **certificate** – грамота, свідоцтво, довідка, сертифікат, посвідка –
 - 1) an official paper stating that you have completed a course of study or achieved something in a particular field, e.g. *The students are distinguished for their success in R & D activity and are awarded certificates and diplomas.*
 - 2) an official document that states that a fact or facts are true, e.g. *After defending their Bachelor's or Master's graduation papers in English the students get certificates stating that their knowledge of English is good enough to allow them to extract information from sources written in English as well as for oral communication with English speaking specialists in their field.*
certificated – дипломований, той, що має вищу кваліфікацію
to certify – підтверджувати, завіряти, сертифікувати (прилад, товар тощо)
certification – підтвердження, сертифікація.

- certified (document, product, specialist)*** – завірений документ, сертифікований (товар), дипломований (спеціаліст)
- certified public accountant (CPA)*** – дипломований бухгалтер вищої кваліфікації, бухгалтер-ревізор
8. ***collaboration*** – співробітництво, співпраця – the act of working together with another person or group to achieve something, e.g. *The investigation is being made in collaboration with a foreign company.*
- to collaborate*** – співпрацювати
- collaborative (effort, work, project)*** – зроблений у співпраці, групою людей
9. ***create*** – створювати – to make something exist that did not exist before; to invent something, e.g. *Sometimes, for the purpose of their investigation, a research team create innovative research techniques.*
- creation*** – створення
- creative*** – творчий
- creatively*** – творчо
10. ***curricular activity*** – програмна діяльність – activity related to the subjects that are taught by a school, college etc., or the things that are studied in a particular subject, e.g. *All the students are involved in research directly related to curricular activity comprising course projects and individual tasks.*
11. ***defend / support*** – захищати – to prove that something is right, e.g. *When the student submits his/her graduation paper and successfully defends it before an examination board he/she graduates from the University.*
- defense*** – захист
- defender*** – захисник
- defensive*** – захисний
12. ***develop*** – розвивати, розробляти – to make a new idea, plan or product become successful over a period of time, e.g. *Scientists are developing innovative technologies.*
- development*** – розвиток, розробка
- developer*** – розробник
13. ***distinguish*** – відрізняти, виділяти – to recognize and understand the difference between similar things or people, e.g. *The best students' research works are distinguished with certificates.*
- distinguished*** – визначний, відомий
14. ***examination board*** – екзаменаційна комісія – a group of people who are assessing students' knowledge of the subject at the examinations, e.g. *When the student submits his/her graduation paper and successfully defends it before an examination board he/she graduates from the University.*
15. ***extracurricular activity*** – позапрограмна, позааудиторна діяльність – it isn't part of the course that a student is doing, e.g. *The extracurricular activity is arranged in the form of students' scientific societies.*
16. ***field*** – галузь, поле, сфера діяльності – a particular sphere of interest, study, knowledge or thought; a subject that people study or are involved in as part of their

- work, e.g. *Our students are doing research in various fields of science and engineering.*
17. **guide** – керувати – to show someone the right way to do something, especially something difficult or complicated; to help someone to move in a particular direction, e.g. *Prominent scientists of the universities guide students in their research work*
guidance – керівництво
under the guidance – під керівництвом
18. **innovative** – раціоналізаторський, новий, перспективний, новаторський, інноваційний – new, different and better than something that existed before, e.g. *Innovative methods and techniques are often proposed by postgraduates in their research papers.*
innovative technologies – перспективні технології
innovate – впроваджувати нові перспективні ідеї, методи, раціоналізаторські пропозиції
innovator – раціоналізатор, новатор
19. **institution** – заклад, організація, товариство – a large establishment or organization that has a particular kind of work or purpose, e.g. *Doing fundamental research is one of the tasks set before any institution of higher learning.*
research institution – науково-дослідний заклад
educational institution – навчальний заклад
to institute – засновувати, вводити, започатковувати
20. **instructions** – настанови – teaching that you are given in a particular skill or subject, e.g. *Before students start working on their course work, they usually receive necessary instructions from their scientific advisers.*
to give instructions; to instruct – давати настанови
an instructor – інструктор, викладач (практик)
instructive – повчальний
21. **integral part** (*syn.: part and parcel*) – невід'ємна частина – forming a necessary part of something, e.g. *Effective communication is an integral part of being a good specialist. Students' research work is an integral part of the educational process in Ukrainian institutions of higher learning.*
22. **investigate** – досліджувати – to try to find out the truth about something such as a scientific problem; e.g. *Fundamental investigations in the fields of power engineering and electronics are of great importance in Ukraine and abroad.*
investigation – дослідження
fundamental investigations – фундаментальні дослідження
to make / carry out / conduct investigations – проводити дослідження
investigative – дослідницький
investigator – дослідник
23. **involve** – залучати – to include or affect someone or something, e.g. *These changes will involve everyone on the staff. Senior students are involved in solving specific problems an enterprise or a business has.*
involvement – залучення

- 24. mandatory** – обов'язковий – obligatory, compulsory, required, e.g. *A foreign language is a mandatory subject for students in their first and second years of study at Lviv Polytechnic National University.*
- 25. master** – оволодівати, опановувати, вивчати – to learn a skill or language so well that you understand it completely and have no difficulty with it, e.g. *The main task set before the students doing research is mastering the methods of independent solution of scientific and technical problems.*
mastering – опанування
- 26. meet world standards** – відповідати світовим стандартам – to correspond to established norms accepted in all countries, e.g. *The research carried out at the University and the developments made here meet world standards.*
- 27. paper / work / project** – робота, доповідь, проект – a) a piece of writing or a talk by someone who has made a study of a particular subject; b) a piece of writing that is done as part of a course at school or university, e.g. *During their studies at the University students have to present several course papers and a graduation work (project).*
course work / paper / project – курсова робота (проект)
graduation paper / project – дипломна робота (проект)
- 28. participate** – брати участь – to take part in an activity or event, e.g. *Every student of a university is expected to participate in research work in this or that way.*
participation – участь
participant – учасник
participative – що бере участь, що може брати участь
- 29. perfect** – вдосконалювати – to make something perfect or as good as you are able to, e.g. *At Lviv Polytechnic the students perfect their knowledge of one of the six foreign languages: English, German, French, Spanish, Japanese and Latin.*
'perfect – досконалій
- 30. postgraduate** – аспірант – someone who is studying at a university to get a PhD (Candidate of Sciences) degree; someone who is studying after finishing a PhD, e.g. *Postgraduates working for their scientific degrees are also active members of research teams.*
postgraduate course – аспірантура
to take a postgraduate course – вчитись в аспірантурі
- 31. promote** – сприяти, стимулювати, заохочувати – to help something to develop and be successful; to encourage someone, e.g. *The research done at Lviv Polytechnic promotes the development of Ukrainian science.*
promotion – сприяння, стимулівання, підтримка, заохочення; підвищення на посаді, просування по службі
- 32. qualification** – кваліфікація – a skill, personal quality or type of experience that makes you suitable for a particular job or position, e.g. *Research work helps students perfect their qualification.*
qualified – кваліфікований, компетентний
to qualify – кваліфікувати, оцінювати

33. **related to** – пов’язаний з – connected in some way, e.g. *All students are involved in research directly related to curricular activity.*
- relate to** – мати відношення, бути пов’язаним з, стосуватися чогось
- relation** – відношення, зв’язок, залежність
- relative** – відносний
- relatively** – відносно
34. **report** – доповідь, повідомлення, звіт – a written or spoken description of a situation or event, giving people the information they need, e.g. *Every student has to make at least one report at a scientific seminar.*
- to report** – доповідати, повідомляти, звітувати
- a reporter** – той, хто звітує; доповідач, репортер
35. **research** – наукове дослідження, науково-дослідний – the activity of finding information about something that you are interested in or need to know about; serious study of a subject, that is intended to discover new facts or test new ideas, e.g. *The students of the final year of studies are doing research for their graduation papers.*
- research work, R & D** – науково-дослідна робота
- to do research** – проводити науково-дослідну роботу
- research team / group** – група дослідників
- research associate** – науковий співробітник
- research institute** – науково-дослідний інститут
- research institution** – науково-дослідний заклад
- research methods** – методи дослідження
- research project** – науково-дослідний проект
- researcher** – дослідник, науковий співробітник
- research worker** – науковий співробітник
36. **responsible for** – відповідальний за – in charge of, having a duty to be in charge of or to look after someone or something, e.g. *He is responsible for supervising students' extracurricular research work at this department.*
- responsibility** – відповідальність, обов’язок
37. **review** – огляд, реферат – an act of carefully examining and considering a situation or process, e.g. *The students doing research have to make a review of special literature in their particular field.*
- to make a review** – робити огляд, готовувати реферат
- to review** – робити огляд
- reviewer** – оглядач, критик, рецензент, референт
38. **schedule / timetable** – розклад – a plan of events and activities, with their dates and times; a list of the times of classes in a school etc. e.g. *The seminars are conducted according to the timetable.*
- to schedule** – призначати на конкретний час
- according to the timetable** – за розкладом
39. **science** – наука – knowledge about the world; a particular part of science, for example, physics, e.g. *Students are doing research dealing with up-to-date issues of science and engineering.*

science and engineering – наука і техніка

scientist – вчений

scientific – науковий

scientific society – наукове товариство

scientific conference – наукова конференція

scientific school – наукова школа

40. **set the task** – ставити завдання – to decide that someone should try and achieve something, e.g. *Scientific advisers set special tasks before the students being involved in extracurricular research activity.*

41. **submit** – подавати на розгляд, для оцінювання – to give a plan, piece of writing etc. to someone in authority for them to consider or approve, e.g. *When the student submits his/her graduation paper and successfully defends it, he/she becomes a graduate.*

submission – подання

42. **supervisor / scientific adviser** - науковий керівник – a person (teacher, scientist, researcher) who observes, monitors, advises the research done by another person (a student, a postgraduate etc.), e.g. *The graduation paper is a small research project carried out by the student under the guidance of a supervisor.*

supervise – керувати, наглядати

supervision – керівництво, нагляд

43. **up-to-date** – сучасний – modern or fashionable, e.g. *Students' research works usually deal with up-to-date problems of science and engineering.*

44. **a wide scale** – широкий масштаб (діапазон) – the large size or high level of something or the large amount that something is happening or being done. e.g. *Research at the University is done on a wide scale.*

45. **state-of-the-art** – найсучасніший рівень розвитку техніки та технології у певній галузі – the highest level of technology in a field at any given time, e.g. *University students get acquainted with the state-of-the-art developments in fundamental sciences.*

Task 4.11. Complete the words to match the definitions provided:

an official paper stating that a fact or facts are true

c _____ c _____

to be able to make the difference between similar things or people

_ i _____ g _____

teaching that you are given in a particular subject

_ s _____ ns

to take part in an activity or event

p _____ e

someone who is studying at a university to get a Candidate of Science degree

_ o _ g _____

a skill that makes you suitable for a particular job

q _____ f _____

an act of carefully examining and considering a situation or process

r _____ w

a person who advises and monitors the research done by another person

s _ _ r _ _ _ r

Task 4.12. Match the following phrases with their definitions:

- | | |
|-----------------------------|---|
| 1. an integral part | a) to decide that someone should try and achieve smth. |
| 2. extracurricular activity | b) the work that is written and submitted by students to crown their studying of a certain course |
| 3. course paper | c) forming a necessary part of something |
| 4. examination board | d) to correspond to established norms |
| 5. to set the task | e) to help something develop and be successful |
| 6. a wide scale | f) it isn't part of the course that a student is doing |
| 7. to meet standards | g) a group of people who are assessing students' knowledge of the subject at the examinations |
| 8. to promote development | h) a large size or high level of something that is happening or being done |

Task 4. 13. Fill in the gaps with the words provided:

Research, to participate, investigation, qualifications, supervision, science, submitted, postgraduate, involvement, scheduled, awarded, certified, creative, developments, researched, qualified, awarded, develop, research, qualifications

1. This book has been very well
2. The whole issue is still under
3. All graduation papers must be ... by Monday.
4. He did his ... work in sociology.
5. Einstein was ... the Nobel Prize for his work in quantum physics.
6. He came up with a really ... solution to the problem.
7. We will ... a few of these points in the seminar.
8. In the learning process the student's emotional ... is of great importance.
9. Taras is a ... student in our lab.
10. Everyone in the class is expected ... in these discussions.
11. Oksana had excellent academic ..., but no work experience.
12. We work under the Chief Engineer's
13. The computer is one of the marvels of modern
14. The meeting has been ... for 2 o'clock.
15. She was ... as a teacher in 1998.
16. There have been significant computer ... during the last decade.
17. I'm doing some ... for an article about student life.
18. It's a complex engineering matter and I don't feel ... to give an opinion.
19. The University ... her a scholarship.
20. Ira has all the right ... to become a good manager.

Task 4.14. Complete the following sentences using the appropriate forms of the following verbs:

to develop, to participate, to arrange, to do, to perfect, to master, to guide, to defend, to involve, to distinguish, to award, to submit, to investigate

1. The students _____ in research right from their first year of studies at our university.
2. Research work helps students _____ their professional skills.
3. Every student of the University _____ in research work in this or that way.
4. All the students _____ research directly related to curricular activity.
5. When the student successfully _____ his/her graduation paper before the examination board, he/she becomes a graduate.
6. The extracurricular research activity _____ in the form of students' scientific societies.
7. At Lviv Polytechnic students _____ their knowledge of one (or several) of six foreign languages taught at the Department of Foreign Languages.
8. The students _____ methods of independent solution of scientific and technical problems.
9. Supervisors usually _____ the research done by the students working at their course or graduation papers.
10. The best students _____ for their success in R&D activity and _____ certificates and diplomas.
11. The students must _____ their graduation papers to the reviewers to look them through and make comments in advance.
12. Urgent problems of modern business _____ by senior students and postgraduates of the Institute of Economics and Management.

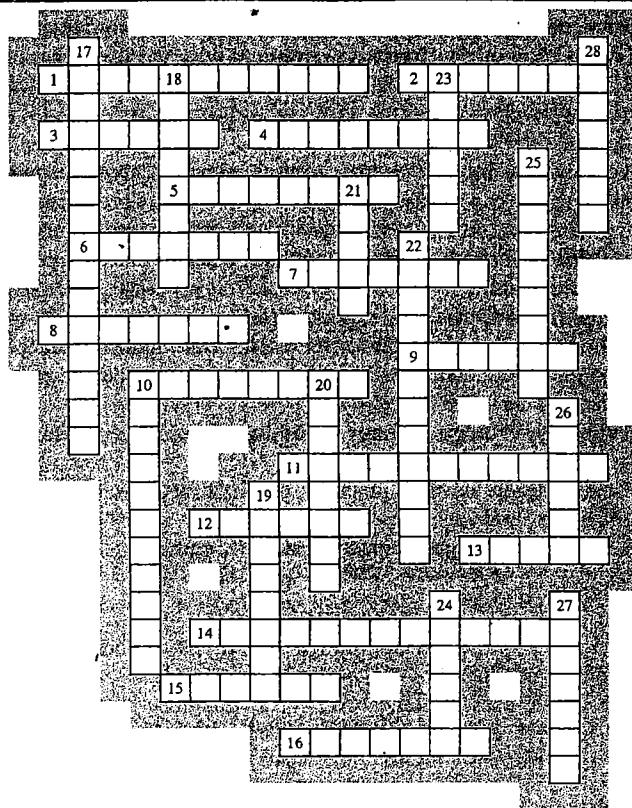
Task 4.15. Do the crossword puzzle translating the following words into English:

Across

1. іспит
2. сприяти
3. творити
4. творчий
5. керівництво
6. пов'язаний
7. організовувати
8. набувати знання
9. доповідь
10. наукове дослідження
11. учасник
12. подавати на розгляд
13. галузь
14. кваліфікація
15. оволодівати
16. захист

Down

10. відповідальний
17. позапрограмний
18. невід'ємний
19. анотація
20. створення
21. нести
22. настанови
23. реферат
24. основи
25. обов'язковий
26. щорічний
27. залучати
28. досконалий



Task 4.16. Read the words and decide which of them do not belong to each group of four items. Comment on your choice:

1. participate/ be involved/ reflect/ be incorporated;
2. lab exercise/ yearly project/ academic year;
3. institution/ establishment/ project/ university;
4. provide/ defend/ submit/ educate;
5. carry out/ conduct/ meet/ perform;
6. lectures/ devices/ apparatuses/ visual aids;
7. chemistry/ mechanics/ electronics/ science;
8. advanced/ qualified/ general/ distinguished;
9. foreign/ Japanese/ urgent/ international;
10. perfect/ improve/ create/ graduate.

Task 4.17. Form derivatives using the following suffixes and translate the newly formed words into Ukrainian. Compose sentences with the derived words.

Nouns:

- ment: achieve, develop, involve, equip, arrange, establish, require, manage, engage, govern, environ, improve, measure, state, treat, employ, judge, assess
- (a) (t) ion: participate, graduate, present, contribute, recommend, collaborate, investigate, create, instruct, relate, supervise, discuss, inform, connect, promote, organize, communicate
- ance/-ence: guide, import, perform; expect, resist, maintain, conduct, appear, depend, occur, admit, attend, accord, prefer, differ, exist, refer, interfere, accept
- ity: active, opportune, punctual, possible, major, familiar, similar, responsible, popular, minor, special, visible
- ist: special, economy, ecology, biology, hydrology, biophysics, climatology, botanic, anatomy
- er: advise, research, teach, develop, manage, organize, support, defend, publish, make, speak, think, mine
- or: supervise, instruct, investigate, construct, initiate, edit, sail

Adjectives:

- ive: execute, legislate, relate, create, attract, quantity, act, communicate, investigate, participate, direct, conduct
- able/-ible: agree, size, pass, prefer, solve, work, imagine, comfort, use, vary, speak, change, value, improve, measure, prove, distinguish, achieve, compare, advise, rely, represent, reason, response, access

Adverbs:

- ly: relative, successful, final, direct, active, creative, careful, independent, thorough, absolute, annual, certain, fluent, bad, full

Task 4.18. Rearrange the following jumbled words and phrases to form sentences. The text in Task 4.35 will help you.

1. In addition to, carries out, qualified specialists, and, extensive research, sciences, branches of science, engineering, in various, humanitarian, social, training, Lviv Polytechnic National University.
2. The main task, problems, is mastering, of, solution, independent, of scientific, and, doing research, technical, the methods, set, before the students.
3. Thus, laboratory, are involved, all the students, graduation projects, to curricular activity, and, in research, comprising, exercises, course works, seminars, individual tasks, directly related.

4. Doing laboratory exercises, and, students, of the University, their knowledge, must apply, display initiative, in specialised laboratories.
5. Close contacts, in general, of higher learning, and, to the latest, in particular, with, and, businesses, urgent problems, introduce, Lviv Polytechnic, engineering, students achievements, involves them, research institutions, in both science, and, of the region, as well as, in research, into, of, modern economic development, and, the country, of institutions.
6. This helps them, most sophisticated equipment, state-of-the-art technologies, their particular field, modern, used in, study, and, handle, to learn, research methodology.
7. Every graduation paper, small research project, a, a leading professor, the student, of, a scientific adviser, this usually being, actively, up-to-date research, is, in a particular field, carried out by, under the guidance, participating in.
8. In some cases, contains, for professional journal, valuable, enough, publication, and, such a, results, publication, the graduation paper, is then recommended.
9. When the student submits, is qualified, finally becomes, successfully defends it, from the University, as a Bachelor or a Master, and, before the examination board, he, in a certain field, in other words, and, a graduate, he graduates, his graduation paper.
10. The, extracurricular, students' scientific societies, is arranged, in the form of, research activity.
11. The purpose, science, is, research and instruction, of such societies, in various fields of, economy and liberal arts.
12. The students, lab set-ups, in the societies, theoretical research, produce visual aids, design devices, issues, and, various, they do, of social and humanitarian, who are active.
13. The most promising, and groups, at the departments, the leading professors, are incorporated, into research teams, organised by, undergraduates.
14. Postgraduates, also, their scientific degrees, active members, working for, research associates, as well as, are, of such teams.
15. At Lviv Polytechnic, perfect their knowledge, of five foreign languages:, students, of one, English, German, French, Spanish and Japanese.
16. Under the guidance of, present their reports, students' scientific conferences, advanced students, Foreign Languages department, teachers, of, prepare, arranged by the department, and, in a foreign language, at, annual.
17. Their reports, of science, usually deal with, engineering, humanitarian problems, urgent problems, social, and.
18. The best students, in a foreign language, and, projects, defend their graduation works.
19. Students are distinguished, in R&D activity, certificates, and, for their success, and, are awarded, diplomas.
20. Students' research work, in general, of the R&D activity, in the University, is part and parcel.

SECTION III. APPLIED GRAMMAR

COMPLEX SENTENCES

A complex sentence is a sentence that consists of the main clause (головне речення) and one or more subordinate clauses (підрядні речення). A subordinate clause is a dependent sentence: it cannot be used without the main clause. The idea conveyed by the main clause is not complete without a subordinate clause. Subordinate clauses are often connected to the main clause with the help of connectors or conjunctions. A subordinate clause may follow or precede the main clause. There are different types of subordinate clauses.

Subject clauses (підметові підрядні речення) perform the function of a subject. They are connected with the main clause in the following ways: a) by means of the conjunctions *that, if, whether*; b) by means of the connectors *who, which, what, whoever, whatever, where, when, how, why*.

Whether their effort to develop an appropriate plan of action was a success is still not obvious. Чи їхня спроба розробити відповідний план дій принесла результат – досі не є очевидним.

Who the presenter was and whose interests he supported was unknown.

Ким був доповідач і чий інтереси він підтримував, було невідомо.

Predicative clauses (предикативні підрядні речення) perform the function of a predicate. The peculiarity of complex sentences with a predicative clause is that in the main clause we find only part of the predicate, i.e. a link verb, which together with the predicative clause forms a compound nominal predicate. These subordinate clauses are connected with the main clause in the following ways:

- a) by means of the conjunctions *that, if, whether, as if;*
- b) by means of the connector *who, which, what, where, when, how, why.*

Our attitude simply is *that facts are facts.* Наше ставлення таке: факти є фактами.

The problem was *how to complete the task on time.* Проблема полягала в тому, як закінчити проект вчасно.

Object clauses (додаткові підрядні речення) perform the function of an object to the predicate-verb of the main clause. They are connected with the main clause in the following ways:

- a) by means of the conjunctions *that, if, whether;*
- b) by means of the connectives *who, which, what, whatever, whoever, whichever;*
- c) asyndetically (без сполучника)

Time will show *whether I am right or wrong.* Час покаже, я правий чи ні.

I am not sure *where exactly the workshop will be held.* Я не впевнений в тому, де саме буде проведено семінар.

Attributive clauses (означальні підрядні речення) serve as an attribute to a noun in the main clause. They are introduced by:

- a) relative pronouns *who, whose, which, that*
- b) relative adverbs *where, when*
- c) asyndetically

You could not but feel sympathy for a man *who failed such an important presentation.* Вам не залишається нічого, крім співчуття до людини, яка провалила таку важливу презентацію.

The time has come *when he is expected to make an important decision.* Прийшов час, коли від нього очікують прийняття важливого рішення.

There was simply nothing else *he could do to improve the situation in the company.* Просто більше нічого не було, що б ще він міг зробити для покращення ситуації в компанії.

Adverbial clauses (обставинні підрядні речення) perform the function of an adverbial modifier. There are the following types of adverbial clauses: *adverbial clauses of time, place, cause(reason), purpose, condition, concession, result, manner, comparison.* The common connectors are:

Time (часу)	after, before, since, when, while, whenever, as, as soon as, once, until, as/so long as, by the time (that), now that
Place (місця)	where, wherever
Cause (причини)	because, since, so (that), in order (that), as
Purpose (мети)	that, in order that, lest
Condition (умовні)	if, unless, even if, only if, in case (that), whether or not, in the event (that), provided (that)
Concession (допустові)	although, while, though, even though, whereas, whoever, whatever, whichever
Result (результату)	that, so
Manner (способу дії)	as if, as though
Comparison (порівняльні)	than, as

Task 4.19. Read the following complex sentences with different types of subordinate clauses, translate them into Ukrainian, and put questions to the subordinate clauses, where possible:

Subject Clauses:

1. Whether you have sufficient computer skills is very important for your future employment. = It is very important for your future employment whether you have sufficient computer skills.
2. What you need is practical experience.
3. If he will work in the students translation bureau depends on his command of English.

Predicative Clauses:

4. The question is how we'll solve this problem.
5. That is why she has chosen this speciality.
6. The matter was that he couldn't submit his course project on time.

Object Clauses:

7. The dean has just told us who will make reports at the next seminar.
8. The lab assistant will explain how this installation works.
9. We didn't know where he had studied programming before he entered our university.

Attributive Clauses:

10. The student whose presentation is the best will be awarded a certificate.
11. There are many reasons why students should participate in research work.
12. He is a member of the students scientific society where he perfects his qualification in the field he majors in.

Adverbial Clauses

of time: 13. He will work as a software engineer after he graduates from our university.

of place: 14. They want to work where they can apply their theoretical knowledge to practice.

of reason: 15. He hasn't written the report because he couldn't find some essential information on the subject.

of purpose: 16. They have arranged a very convenient time-table so that every student could come and carry out experiments in this lab.

of manner: 17. She completed her course project as fast as she could.

of condition: 18. If he had read scientific journals, he would have known about the latest achievements in this field of science.

Task 4. 20. Find examples of complex sentences in the text presented in the Reading Section and the texts for extended reading. Translate them into Ukrainian.

CONDITIONAL CLAUSES

Type	Main Clause (Tenses to be used)	Connectors	Subordinate Clause (Tenses to be used)
Conditional I (real for present and future) реальна умова, Real Condition	Present, Future Presentations <i>are</i> always successful, Презентації завжди мають успіх, You <i>will be</i> a success with your presentation, Ви <i>зробите</i> успішну презентацію,		Present <i>instead</i> of Future presenters <i>put</i> enough effort into their preparation. доповідачі <i>докладають</i> достатньо зусиль для їх підготовки. you <i>put</i> enough effort into its preparation. <i>прикладете</i> достатньо зусиль для її підготовки.
Conditional II (unreal for present and future) малоймовірна умова, що стосується теперішнього та майбутнього часу, уявна ситуація, Improbable Condition	would, could, might + Indefinite or Continuous Infinitive You <i>could make</i> a successful presentation, Ви <i>могли б зробити</i> успішну презентацію, I <i>would prepare</i> well for the next seminar, Я <i>б добре підготувався</i> до наступного семінару,	<i>if, in case,</i> <i>provided,</i> <i>suppose,</i> (якщо, за умови, що, у випадку, якщо), <i>unless</i> (якщо не)	Past Simple, Past Continuous (<i>were</i> for all persons is preferred, though <i>was</i> is also common in spoken English) you <i>prepared</i> well. якби добре підготувались. I <i>were</i> you. на твоєму місці (якби був тобою).

Conditional III (unreal for ever) нереальна умова на завжди, вона вже не відбулася, стосується минулого, Unreal Condition	would, could, might + Perfect Infinitive You <i>could have made</i> a successful presentation yesterday Ви <i>могли б зробити</i> успішну презентацію вчора (але цього не сталося)	Past Perfect you <i>had prepared</i> better. якби краще підготувалися (але ви цього не зробили)
---	--	---

Note: An if- clause can come at the beginning or at the end of a sentence. When it comes first, it is often separated by a comma.

Inversion in Conditional Sentences

Adverbial clauses of condition containing the verbs **had, were, would, could** are often introduced without any conjunction. In these cases we find *inversion* (інверсія, зміна прямого порядку слів в стверджувальному реченні).

Had you come on time, you would have listened to an interesting presentation.

(If you had come on time ...). Якби ти прийшов вчасно, то послухав би цікаву презентацію.

Were you more attentive, you would always notice all the peculiarities of the reports made.

(If you were more attentive ...). Якби ти був уважнішим, то завжди помічав би особливості проголошуваних доповідей.

Task 4.21. Put the verbs in brackets into the appropriate forms (use Conditional I)

1. If students (participate) in research work, they (perfect) their qualification.
2. If the students (require) further information, the teacher (give) them detailed instructions.
3. Her scientific advisor (be) sorry if she (not make) a report in time.
4. I (to catch) the train home if the meeting (not finish) late.
5. If he (enjoy) his new job, he (work) better.
6. If graduates (maintain) close contacts with leading research institutions, they (learn) modern methods of scientific research.
7. If you (enter) our University, you (be involved) in research work from the first year of studies.
8. We (be able) to carry out experiments at the laboratory if we (acquire) necessary fundamental knowledge.
9. The students (defend) graduation projects successfully if they (work) hard during all years of studies.

10. If Peter (attend) lectures and seminars regularly, he (not fail) the exams.
11. If students (study) for 5 years at University, they (obtain) Master's degree.

Task 4. 22. Put the verbs in brackets into the appropriate forms (use Conditional II):

1. If there (be) any changes in the timetable, the Dean's Office (inform) us about it.
2. If he (take) post-graduate courses, he (know) the main methods of work on scientific literature.
3. We (buy) this new equipment if it (not / be) so expensive.
4. If I (be) you, I (look through) those figures once more.
5. If your report (deal) with urgent problems of engineering, you (be awarded) a diploma.
6. If you (work) in our students' scientific society, you (learn) to design different devices.
7. If our postgraduates (know) a foreign language, they (make) reports in it.
8. If students (write) scientific papers, they (submit) them for professional journal publications.
9. If we (master) new approach to this phenomenon, we (confirm) our theory.
10. Engineers (obtain) precise data if they (not/lack) appropriate equipment.
11. It (be) better if they (use) computer-aided design (CAD) while working at their research papers.
12. If specialists (find) a suitable technique, they (not/have) difficulties with their experiments.

Task 4. 23. Rewrite these sentences as Conditionals II. Follow the pattern.

The reason they are a leading research institute is that they make fundamental investigations.

If they didn't make fundamental investigations, they wouldn't be a leading research institute.

1. The reason the most promising graduates take post-graduate courses is that they enjoy R&D.
2. The reason I can't contact the organisers of the scientific meeting is that I haven't got their address.
3. The reason the results of his research are recommended for professional journal publication is that they are valuable enough.
4. The reason the audience understands his reports is that he speaks in a simple language.

5. The reason they treat you like this is that they don't understand your behaviour.

Task 4. 24. Put the verbs in brackets into the appropriate forms.

1. If he (to know) English well, he (to defend) his graduation project in a foreign language.
2. We (to move) to a bigger hall if the audience (to be) more numerous.
3. Her report (to be) better if she (to be) more prepared.
4. If your graduation paper (not contain) valuable information, it (not to be recommended) for professional journal publication.
5. Our university (to receive) a letter of invitation, if there (to be) a scientific conference.

Task 4. 25. Rewrite these sentences as Conditionals III. Follow the pattern.

Unfortunately he didn't notice this advertisement, so he didn't apply for the job.

If he had noticed this advertisement, he would have applied for the job.

1. Unfortunately he failed his exams and was expelled from the university.
2. It only happened because she didn't follow the instructions of her scientific advisor.
3. My friend didn't do much maths at school, so he found economics difficult at university.
4. We didn't buy the equipment because it was so expensive.
5. I didn't see him, so I couldn't give him your message.
6. They tried a new approach and made fundamental investigations.
7. He was so interested in computer technology that he took it as his special field.
8. The researchers didn't possess reliable information on the subject, that's why they didn't prove their hypothesis.
9. She acquired proper knowledge and practical skills, so she carried out independent investigation of this scientific problem.

Task 4.26. Put the verbs given in brackets into the appropriate forms:

Example: If Einstein (formulate) the relativity theory, somebody else (do) it.

If Einstein hadn't formulated the relativity theory, somebody else would have done it.

1. If you (check) equipment before you started the experiment, you (not/have) any trouble with it.
2. If I (speak) more confidently at the interview, they (offer) me this job.
3. If our conference (not/be sponsored) by important organizations, it (not/be) successful.
4. If students (do) significant research, they (can publish) the results in scientific journals.

5. If you (be interested) in computer technology, you (enter) the Polytechnic University.
6. You (pass) mathematics if you (look through) all the necessary material thoroughly.

Task 4. 27. Complete the sentences:

1. I would participate in the work of this students' scientific society...
2. She would have made a much more interesting report at a scientific seminar...
3. If the results of my research work were valuable enough for a professional journal publication...
4. Ihor would have become a student of the advanced group...
5. If I didn't work under the guidance of my supervisor...
6. I would defend my graduation project in English...
7. If the students weren't involved in research right from their first year of studies...
8. If I submitted my research project in time...
9. I would produce visual aids like other students...
10. If Olena defended her research work successfully ...
11. I would have been a member of the research team...
12. If I weren't given a special course of lectures on methods of work on scientific literature...
13. Taras would have become a postgraduate...
14. If I wrote a graduation paper...
15. If I were a graduate...
16. If I were you...
17. Had I more free time...
18. If they had had more money...
19. Provided you were a chemist (an economist, a manager, an engineer, a programmer) ...
20. If he had been invited to the conference...
21. Were you more attentive...
22. If our students carried out their experiment...
23. If she displayed her initiative...
24. Were she a promising undergraduate...
25. Provided she had known English better...

Task 4.28. Translate the following sentences into English using Conditionals:

1. Якщо ти вчасно заплатиш за користування Інтернетом, не будеш мати проблем зі зв'язком.
2. Якби я мав достатньо грошей, то прибав би потужний комп'ютер.
3. Якби я знав Java Script, то міг би одержати цю роботу. (2 варіанти).
4. Якби ти добре знов знати закони ринкової економіки, то тобі вдалося б уникнути невдачі.
5. Шкода, що ти не мав часу прийти вчора на лекцію професора Коваля. Якби ти був присутній на лекції, то дізناєшся б багато цікавого про сучасний стан технології виготовлення комп'ютерних чіпів.
6. Якби менеджери не використовували

сучасні інформаційні технології, то їм було б набагато складніше приймати ефективні рішення. 7. Якщо ви братимете активну участь у студентській науковій роботі, вам вдастся досягти більшого успіху у своїй професійній кар'єрі. 8. Якби ми скористалися іншим методом, проводячи експеримент вчора, то безумовно одержали б точніші результати. 9. Якщо ви не здастес вчасно свою курсову роботу, то оцінка буде знижена. 10. Було б етично правильним, якби всі студенти не забували вказувати джерела інформації, використаної в своїх рефератах. 11. Якщо вищий навчальний заклад не буде проводити достатньої науково-дослідної роботи, він не матиме права одержати найвищий рівень акредитації. 12. Студенти були б краще підготовлені до професійної роботи, якби вони користувалися сучасним обладнанням при виконанні лабораторних робіт під час навчання. 13. Якщо студентів всіх спеціальностей будуть знайомити з законами розвитку ринкової економіки, то багато з них захочуть почати свій власний бізнес у майбутньому. 14. Якби до участі у студентських наукових конференціях залучалося більше студентів, то всі вони мали б кращі навики підготовки презентацій та спілкування з аудиторією. 15. У вас були б кращі можливості одержати цікаву роботу, якби ви брали активну участь у позааудиторній науково-дослідній роботі. 16. Якби в програмі не було так багато логічних помилок, то її можна було б використати для вирішення цієї проблеми. 17. Якби ви добре сформатували текст, то він мав би набагато кращий вигляд. 18. Якби ви взяли участь у вчорашньому тренінгу для користувачів, то у вас не виникало б питань щодо використання цієї програми. 19. Якщо у програмі не буде системних помилок, то вам не доведеться знов запускати комп'ютер. 20. Якби не існувало мов програмування, то було б неможливо спілкуватись з комп'ютером. 21. Якщо ви знатимете лише частину поля, яке ви шукаєте, то вам слід буде скористатися джокером (a wildcard). 22. Якщо вам потрібно буде виконувати велику кількість обчислень, то доведеться скористатись електронними таблицями. 23. Якби я не забув пароль вчора, то не втратив би стільки зайвого часу. 24. Якщо в мене буде вільний час влітку, то я використаю його на вивчення ще однієї мови програмування. 25. Якби при навчанні в школі майбутні студенти приділяли більше уваги вивченню інформатики, то не мали б проблем з цим предметом в університеті. 26. Якщо студенти знатимуть досконало хоча б одну іноземну мову, то матимуть набагато кращі можливості професійного розвитку у майбутньому. 27. Якби не використовувались мультимедійні програми, то комп'ютерні ігри не були б такими захоплюючими. 28. Якби мені вдалося добре відлагодити програму вчора, то я б ще вчора мав можливість скористатися нею.

Task 4. 29. Use the appropriate forms of the verbs given in brackets:

1. I would make a report at a scientific seminar, if I (to be) you.
2. If these students (to be involved) in research, it will perfect their qualification.
3. If your graduation paper (to contain) valuable results, it would have been recommended for publication.

4. If you were an active member of scientific societies, it (to help) you in your research work.
5. If he (to know) English better, he could have defended his graduation paper in this foreign language.
6. If they had been more careful, they (not to have) any trouble with this device.
7. Had I more free time, I (to investigate) this problem more deeply.
8. If I were you, I (to study) two foreign languages.
9. You would carry out these experiments more quickly if you (to be) more experienced.
10. He could have published his paper in professional journals, if he (to do) some interesting research.

Task 4. 30. Open the brackets using the appropriate verb forms:

1. I (to finish) this work next week, if I (to get) reasonable results.
2. It (to be) much better to work in the lab, if it (to be equipped better).
3. They (to test) their hypothesis if they (to carry out) this experiment yesterday.
4. You (to finish) your work in time, if you (to find) the right approach to solving this problem.
5. Unless he (to take part) in this experiment tomorrow, we (not to get) reliable results.
6. If he (not to come) in time yesterday, they (to finish) their research without his help.
7. Provided they (to prepare) for their exams better, they (to get) only excellent marks now.
8. If we (to know) the exact time of carrying out the experiment, we (to call) him immediately.
9. If I (to be) you, I (to investigate) these properties myself.
10. If he (to be) a student of the advanced group, he (to defend) his diploma project in English.

SECTION IV. DEVELOPING SPEAKING SKILLS**Task 4. 31. Have a talk with someone. Make up dialogues using modifications:**

This is how you may work:

1. Read the dialogue several times until you are quite fluent.
2. Learn the dialogues in pairs.
3. Ask and answer the questions given below some dialogues.

4. Give your own variations, substituting the words in bold with the words from **Variations** column.
5. Make up your own dialogues.

Variations

1

- A. I'd like to **do** research.
 B. What **sort** of research would you like to do?
A. I'd like to do research in **materials science**.

- A. to carry on, to carry out; to conduct
 B. type, kind
A. telecommunications; financial management; computer technology; ecology

2

- A. What problem are you **studying** now?
B. I am studying **semiconductor and metal films** for a variety of practical applications.

- A. engaged in; interested in; investigating
B. electrical properties of semiconductors, the structure and physics of crystals; thermal design of ICs, decision support systems, information technologies, data compression

What problems deserve theoretical and experimental investigation in your field?

3

- A. What is the **aim** of your research?
B. To **investigate** optical properties of solids. I do it alone and in **collaboration** with professor Semkiv.

- A. objective; purpose
 B. to research; to study; to clarify; in co-operation; working together

What, do you think, are the advantages of team work?

4

- A. What can you say about the experiment you are going to start in January?
B. It is a very specific experiment. We are going to investigate various aspects of electron behavior in matter and hope to get important results.

- B. It's a highly technical experiment.
 It's a reliable experiment.
 It's a carefully designed experiment.

What can you say about the experiment you took part in (for example, while doing your lab work)?

5

A. We'll have to overcome a few obstacles before we start the experiment.

B. Yes. I'm afraid we are going to have some trouble with our apparatus.

B. to lack adequate equipment (reliable machines, suitable techniques, high-precision instruments)

Have you ever had any difficulties with experiments in the physics laboratory?

6

A. We must learn the technique for our experiment.

A. look for a suitable technique; find the right approach; work out a new method; use a suitable procedure; try a new approach

B. The method we are planning to use is quite new.

Do you use conventional or new methods in your experiments?

7

A. What are research interests of Professor Hnatiuk?

A. scientific, professional

B. His current research interests include microprocessors, he is very receptive to new ideas. Besides he supervises students in their research.

B. present, latest; focus on, concern; responsive, quick to take; guides; helps

Are you receptive to new ideas?

8

A. In what field is Dr. Ivaniiv most active?

A. area, sphere, branch

B. Training of young scientists and popular science writing for the young.

B. science students, undergraduates, postgraduates

What science books do you like to read? What is your attitude to science fiction?

9

A. Are you through with your research on the effects of air pollution on health?

A. Have you finished; completed; done

B. Not yet.

B. Not quite; No, I'm afraid not; No, I don't think so.

"There are three stages in any research: the first is to begin it, the second is to finish it and the third is to publish it." (M. Faraday).

Which stage in your opinion is more difficult and why?

Task 4. 32. Work in pairs. Read the following dialogues several times until you are quite fluent. Learn the dialogues in parts, practice them. Ask and answer the questions given below each dialogue.

A. Do you know I've already passed my exams and I'll start working on my course paper next term?
B. Oh, will you? I didn't know that! Have you chosen the subject?

A. I think I have. But I'll have to see my supervisor about it.
B. Take your time! There's no hurry. Think over your choice.

Have you chosen the subject for your course paper? Who helped you make your choice? What is the role of the supervisor in developing a person's talents?

A. How are you getting on with your research?
B. Fine! Now I have the problem straight! I am just waiting until I have all the data in.

A. But you may have a tremendous job, classifying and organizing the data, which may result in several false starts.
B. But can it be helped?

How are you getting on with your lab work (your research)? What methods do you use to make your research more efficient? What has your recent research shown? Do you take an active part in the work done by your department?

A. Hello! Haven't seen you for ages! Have you been away from Lviv?
B. Yes, I've just come back from the All-Ukrainian Students' Competition sponsored by the Students' Scientific Societies of Ukraine.

A. Got a diploma?
B. I got a medal and a prize for my research in the field of magnetism.

A. Congratulations! What a clever lad I have for a friend!
B. I was more successful than I had expected.

A. Hello! I think you're badly neglecting your friends these days!
B. I've been terribly busy lately. I'm the Chairman of the Students' Scientific Society, you know.

- A. I'm afraid you look busier than you really are. But all work and no play makes Jack a dull boy.
- B. We are getting ready for a students' conference. There is a long agenda to think over.

Do you take part in the work of a Students' Scientific Society? If there is no such a society at your institute (university, in general), what are your ideas as to the necessity and advisability of having such an organization?

Task 4. 33. Speak on the topic *Students' Research Work*, using the following outline and word combinations:

I. The purpose of the students' research work

- to help students perfect and consolidate their knowledge;
- to intensify the process of training specialists;
- to provide students with an opportunity of applying their theoretical knowledge to practice;
- to help students master methods of independent work and acquire skills of research activity;
- to develop students' creative thinking;
- to acquaint students with the latest achievements in a certain field of science and their practical application.

II. Close connection between the students' research work and educational process

1. involvement of students in research work from the first year of study;
2. guidance of the students research work by the most experienced members of the teaching staff;
3. the use of the research work results in curricular and extracurricular activity.

III. Forms of students' research work

1. curricular activity: laboratory exercises, course and diploma projects, seminars, individual tasks;
2. extracurricular activity: work in students' scientific societies, participation in scientific conferences, being incorporated in research groups.

IV. Practical results of the students' research work

1. to design devices and laboratory apparatus;
2. to produce visual aids;
3. to prepare short information about one's investigations;
4. to present one's reports at seminars and conferences;
5. to write a diploma project to an order of a particular enterprise;
6. to learn how to handle equipment.

V. The role of the Foreign Languages Department in the organization of the students' research work

1. to help students acquire skills of work on scientific literature in foreign languages;
2. to give instruction in the methods of extracting essential information, making abstracts and reviews of scientific texts in foreign languages;
3. to organize students' scientific conferences in foreign languages;
4. to train students for work in translation bureaus;
5. to train students for the defense of their diploma projects in foreign languages.

Task 4. 34. Speak about your current research work, using the following questions as an outline:

Have you got any experience in carrying out research work?

If so, how many course projects or scientific papers have you written?

What is the subject of your current scientific work (or course project)?

What field of science does it deal with?

How long have you been working on it?

Who is your research supervisor (scientific adviser)?

What literature are you consulting?

Do you use any information from foreign scientific journals or the Internet?

Does your work include any drawings?

Will you have to carry out any experiments to complete your work?

Will you have to produce any models for demonstration?

Do you use a computer while working on your course project?

If so, what kind of software do you use? (Application software: word processing programs to write texts, spreadsheet programs to do calculations, graphics package to produce drawings.)

How much work has already been done?

In what form are you going to present your work (written, typed, printed)?

What is the deadline for submitting it? (When are you to submit it?)

Will you have to defend (support) your work?

What language will you present it in?

Will your work have any practical application?

Are you going to present the results of this work at any seminar or conference?

Have you thought over the subject of your diploma project yet?

Would you like your diploma work to be connected with your current research work?

SECTION V. READING AND WRITING

Task 4. 35. Read the text, make up a plan, then compile an abstract and a summary of it (Consult the Tasks of Section VI for the instructions).

There are two major tasks set before any institution providing tertiary education in our country: to train highly qualified professionals and to carry on research in various branches of science and engineering. The latter concerns, to a large extent, universities. So, Lviv Polytechnic, being a national university, has, as one of its primary tasks, been doing both fundamental and applied research involving the staff of its numerous research laboratories, its professors (many of whom are heading scientific schools), its teaching staff as well as the ablest students of the university.

Students' research work is an integral part of the educational process in Ukrainian institutions of higher learning. In addition to training qualified specialists Lviv Polytechnic National University carries out extensive research in various branches of science, engineering, humanitarian and social sciences.

The students are involved in this or that kind of research right from their first year of studies here. Research work helps students perfect their qualification.

The main task set before the students doing research is mastering methods of independent solution of scientific and technical problems.

Every student of the University participates in research in this or that way. Thus, all the students are involved in research directly related to curricular activity comprising laboratory exercises, course works, graduation projects, seminars and individual tasks. Doing laboratory exercises according to the timetable in specialised laboratories of the University students are given an opportunity to apply their knowledge and display initiative. While preparing their reviews and oral presentations in humanitarian subjects they learn how to deal with large numbers of theoretical sources, the activity that is considered to be a kind of research work. Preparing their course works under the guidance of professors, associate professors and experienced teachers, junior students learn the basics of research.

Close contacts of institutions of higher learning in general, and Lviv Polytechnic in particular, with research institutions and businesses introduce students to the latest achievements in both science and engineering. Due to this, students are involved in research dealing with urgent problems of modern economic development of the region and the country as a whole. This helps them learn modern research methodology used in their particular fields, study state-of-the-art technologies and handle the most sophisticated equipment.

The students taking Bachelor's course and those studying to obtain Master's degree are doing research while preparing their graduation papers. In general, Bachelor's and Master's graduation works (projects) reflect the knowledge and practical skills acquired by the students in their particular fields. Every graduation paper is a small

research project carried out by the student under the guidance of a supervisor (scientific adviser), this usually being a leading professor (associate professor) or any other scientist or researcher actively participating in up-to-date research in a particular field. Very often students graduation papers are valuable contributions to solution of a concrete practical problem an enterprise or a business has. Having thoroughly studied the existing problems, students come up with ideas, develop practical recommendations and measures to be taken to improve the situation.

In some cases the graduation paper contains results valuable enough for a professional journal publication and such a publication is then recommended. When a student submits his/her graduation paper and successfully defends it before the examination board, he/she is qualified as a Bachelor or a Master in a certain field and finally becomes a graduate, in other words, he/she graduates from the University.

The extracurricular research activity is arranged in the form of students' scientific societies. The purpose of such societies is research and instruction in various fields of science, economy and liberal arts. The students who are active in the societies design devices and produce visual aids, various lab set-ups, they do theoretical research into social and humanitarian issues.

The most promising undergraduates are incorporated into research teams and groups organised by the leading professors at the departments. Postgraduates working for their scientific degrees as well as research associates are also active members of such teams.

Every year the ablest graduates of the University are given an opportunity to develop their research skills while taking postgraduate courses. All institutes of the University as well as the departments of the institutes are headed by prominent scholars and scientists whose names are well known not only in Ukraine but also abroad. These scientists and scholars supervise the research done by postgraduates. During a three-year course postgraduates carry out research widely using information obtained from the books and periodicals in their field of research, written in foreign languages, an examination in a foreign language being a mandatory postgraduate course entrance exam. In three years every postgraduate is supposed to present a dissertation for the Candidate of Science degree. In their theses postgraduates are expected to propose some innovations and use some innovative methods and techniques.

At Lviv Polytechnic students perfect their knowledge of one of six foreign languages: English, German, French, Spanish, Latin and Japanese. Foreign languages help students do research in their fields of interest by way of enabling them to read professional literature and periodicals in foreign languages, communicating with foreign specialists while participating in scientific conferences, doing research in collaboration with foreign specialists, performing joint projects, using the Internet. Under the guidance of teachers of Foreign Languages Department the best students prepare and present their reports in foreign languages at annual students' scientific conferences arranged by the department. Their reports (presentations) usually deal with urgent problems of science, engineering, social sciences, humanities. The best students defend their graduation works and projects in foreign languages. Students are distinguished for their success in R&D activity and are awarded certificates and diplomas.

Students' research work is part and parcel of the R&D activity conducted at the University in general. Research work is done here on a wide scale. There are a number of research laboratories and designing bureaus in the University that are responsible for up-to-date investigations and developments. The research carried out at the University and the developments made here meet world standards. The fundamental investigations in the field of physics, radio engineering, electronics, mechanics, chemistry and chemical technology, geodesy and mathematical sciences, economics and management are well-known and are of importance both in Ukraine and abroad.

Task 4.36. Topics for writing essays with previous brainstorming in the classroom:

1. Do you agree or disagree with the following statement? Students should start their scientific research activity as soon as possible.
2. Some students think that they can do research better by themselves than under the guidance of a supervisor. Others think that it's better to have a scientific adviser. Which way do you prefer?
3. While working on your course paper do you prefer using the Internet to attending a traditional library? Offer your arguments.

Task 4. 37. Respond to the following advertisements, writing a CV and a covering letter:**Sheffield Business School**

Research Assistant

Temporary for three years

Up to £15, 288 pa

As a result of winning additional research funding, the Change Management Research Center can offer a post graduate researcher the chance to undertake a project examining how manufacturing companies build strategic capabilities for future success through organizational learning.

Based at our Totley campus, this project is funded by the CDP group of EPSRC. You'll be involved in all aspects of the project, including reviewing literature, data collection and analysis, report and article writing, and conference presentations.

Able to communicate effectively with all levels of management in the collaborating companies, you should also be able to plan and prioritize your workload and work effectively as part of a team.

If you don't hold a higher degree, we'll give every encouragement to register for one.

Please quote reference 316/95

For further information or an application form please contact the Human Resources Department Sheffield Hallam University City Campus
Pond Street Sheffield S1 1WB Closing date is 19 March 2005
Telephone 0114 253 3946

Working towards equal opportunities **Sheffield Hallam University**
Education for business and the professions

Research Studentships

You will join our established team in the policy research center, initially for two years but with a possible extension to three. We are offering salaries of £5,000 per annum, and you will be required to register for the award of MPhil or PhD.

We have three Studentships to offer, and in addition to holding a good first degree or master's qualification, your interests should cover one or more of these areas:

Applied economics; industrial policy; government-business relationships; small business promotion; local economic policy; regional policy; business history; local governance; labour market analysis.

To apply, you should submit your CV and a covering letter, outlining your research interests, to Dr. Royce Turner

Policy Research Centre Sheffield Business School

Sheffield Hallam University Unit 7

The Science Park Howard Street

Sheffield S1 2LX

Closing date is 19 March 2005

(Taken from *The Guardian*)

Task 4. 38. Read the text below to find the answers to the following questions:

DEGREE REQUIREMENTS AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)

1. What degrees are conferred by MIT?
 2. How long should one do research to get the Master's degree (Engineer's degree, Doctor's degree)?
 3. Where are theses prepared? Is residence obligatory?
 4. Compare the time necessary and the requirements to the thesis prepared for obtaining Master's degree, Engineer's degree and Doctor's degree at MIT.
 5. What are the language proficiency requirements at MIT?
 6. Where are PhD and ScD awarded?

Graduate students may pursue work leading to any of the following degrees:

Doctor of Philosophy, PhD

Doctor of Science, ScD

Engineer's Degree (in engineering departments only)

Master of Science, MSc, SM

Master of Architecture, MArch

Master in City Planning MCP

The Master's degree requires a minimum of one academic year of study, the Engineer's degree – two years and the Doctor's degree – three or more years beyond a baccalaureate in the same field. For the S.M. the minimum is one academic term, for the Engineer's it is two academic terms and for the Doctorate it is four academic terms. All degree requirements include completion of an acceptable thesis prepared in residence unless special permission is granted for the part of the thesis work to be done elsewhere.

In the School of Engineering students may be awarded an Engineer's degree. This program provides a higher level of professional competence than it is required by the program leading to the Master's degree but with less emphasis on creative research than it is expected in a doctoral program.

A Doctor's degree requires original research of high grade and satisfactory completion of an approved program of advanced study. The degrees of Ph.D. and Sc.D. are awarded interchangeably by all departments in the Schools of Engineering and Science (except biology) and in the fields of architecture, biology, economics, linguistics, management, operations research, philosophy, political science, urban studies and planning. Admission to MIT for the Master's degree does not necessarily imply an automatic commitment by MIT beyond that level of study.

A few departments require that the Doctoral candidate take a "minor" program outside the principal field. Language requirements vary and some departments require a thorough knowledge of one relevant foreign language or reading knowledge of two.

All students whose first language is not English will be required to take the English Evaluation Test (EET) which is given during the week prior to Registration Day. The EET test is a diagnostic test (unlike the TOEFL which is an achievement test). The purpose of the test is to help students identify their strengths and weaknesses in written and oral English. Scores below 575 may result in the withdrawing of the visa documentation for a candidate found admissible.

Task 4. 39. One of the practical skills a researcher needs while presenting the results of his/her investigation (submitting an article to a scientific journal, for example) is the skill of writing an abstract of his/her article correctly. Get acquainted with the abstracts presented below and pay attention to the phrases in *italics* that are characteristic of article abstracts. Translate them.

A Methodology of fitting and validating metamodels in simulation

Abstract. *This expository paper discusses* the relationships among metamodels, simulation models and problem entities. A metamodel or response surface is an approximation of the input/output function implied by the underlying simulation model. There are several types of metamodel: linear regression, splines, neural networks etc. *This paper distinguishes* between fitting and validating a metamodel. Metamodels may have different goals: (i) understanding; (ii) prediction; (iii) optimization; (iv) verification and

validation. For this metamodeling, *a process* with thirteen steps *is proposed*. Classic *design* of experiments (DOE) *is summarized*, including standard measures of fit such as the R-square coefficient and cross-validation measures. *This DOE is extended* to sequential or stagewise DOE. *Several validation criteria*, measures and estimators *are discussed*. *Metamodels* in general *are covered*, along with a procedure for developing linear regression (including polynomial) metamodels.

Cryptanalytic Attacks on Pseudorandom Number Generators (PRNGs)

Abstract. In this paper *we discuss* PRNGs: the mechanisms used for real-world secure systems to generate cryptographic keys, initialization vectors, “random” notices and other notices assumed to be random. *We argue* that PRNGs are their own unique type of cryptographic primitive and should be analyzed as such. *We propose* a model for PRNGs, *discuss* possible attacks against this model *and demonstrate* the applicability of the model (and our attacks) to four real-world PRNGs. *We close with a discussion* of lessons learned about PRNG design and use, and a few open questions.

Task 4. 40. Translate the following text into English working in groups or pairs and use the information in making up an abstract of a specialist article assigned to you (your group) by the teacher.

Анотація спеціальної статті чи книги – це коротка характеристика оригіналу, що викладає його зміст у формі передачі основних проблем, а інколи подає його критичну оцінку.

Анотація повинна дати уяву про характер оригіналу (стаття, науково-популярна книга і т.п.), про його побудову (питання, висновки, які робить автор), об'єм матеріалу, якість викладу, обґрунтованість висновків. Щодо критичної оцінки, то її може не бути, якщо у цьому немає особливої потреби.

Для складання анотації треба мати відповідні знання та навики, вміти скласти план, виділити основні положення та центральні питання. Тут необхідні навики як аналізу тексту, так і його синтезу.

Анотація об'ємом більше, ніж 500 друкованих знаків на практиці не зустрічається.

Task 4. 41. Translate the text and compare the information it contains with the information on abstracts from Task 40.

Abstracts

Abstracts appear at the beginning of technical reports and briefly summarize what the document contains. Most abstracts contain four elements – (1) the purpose, (2) the methodology, (3) the results, and (4) the conclusions – and which of these you include depends on the type of document you are writing, the requirements given to you (from your company, your teacher or a professional board and the needs of your readers). Usually, writers draft the abstract after they have written the report, so that it accurately reflects the material in the document. There is a school of thought that suggests you

should write the abstract first as a means of focusing on what you want the document to say, but most technical communicators choose to wrestle with the report first and then write the abstract afterwards.

Whether you decide to write your abstract before or after you draft the document, you should think carefully about which kind of abstract serves your purpose best and meets the needs of your readers. In general, there are two types of abstracts:

1. The descriptive abstract acts as a prose table of contents indicating the main topics that are covered within the body of the document. In other words, it is a general-purpose device that doesn't contain a lot of details or quantitative information. Readers who prefer this type of abstract want to know what the general coverage of the document is, what the subdivisions are, and how the material is developed. An example of a descriptive abstract:

Organizational communication and Culture: A Study of 10 Italian High-Technology Companies. An important contribution of this research is the testing in international environments of communication and culture models previously developed within U.S. high-technology organizations. Specifically, this research demonstrates that relationships among organizational culture themes, employee values, organizational communication activities, and perceptions of a variety of organizational outcomes are similar but not identical for U.S. and European high-technology organizations. Second, the research extends previous work by identifying cultural dimensions that are related to a variety of communication processes.

2. The informative abstract acts as a document in miniature, a capsule version of the overall report or proposal highlighting the primary ideas. It is often longer than the descriptive abstract and is preferred by readers who want to get the main points without reading the entire document or who need to take action on these important points immediately but will read the entire document later. For example:

The objective of the electro-mechanical project was to design and build an experimental testbed for nonlinear control research. The final design is a Twin-Bar Rotary (TBR) System that consists of two easily reconfigured flywheels with a flexible shaft. Masses are attached to each bar on a pulley connected by a wire to a single compression spring. A DC motor rotates the testbed at a maximum of 100rpm to accommodate safety constraints. When the shaft on the testbed rotates, the masses move out radially allowing the entire system to achieve a 90% inertial change.

Our data acquisition group has also provided the means to control and analyze the system with computer program and optical encoders. This TBR System can be used to demonstrate physical programming – a highly effective system optimization approach – in the context of control research.

Most abstracts are no more than one page in length – most often they are no more than 150 words.

(Taken from *Writing for the Technical Professions*
by Kristin R. Woolever)

Task 4. 42. Note some useful tips on how to write *a summary*. It is simple and exciting. Translate the tips to be further used for practical purposes:

I. Study the text: read it first rather quickly to get the general meaning. Then read more carefully following the author's argument and noticing what is a fact and what is an opinion, what is general statement and what is particular example. It is also helpful to summarize each paragraph in a few words at this stage.

II. Identify the key points: note that some parts of the text may be completely irrelevant. Go through the text again and mark the places where important information is given by underlining, highlighting with coloured pen or simply making a mark on the margin.

III. Make notes: write down the key points you've identified in note form *in your own words*. It is especially important for two reasons:

- a) it shows how you understand what you have read;
- b) it helps you to fit all the necessary information into the word limit.

At this stage a good command of English vocabulary is required (synonyms, antonyms, particular and general words).

IV. Put points in order: look at the list of points you have made and see if there are any which go together. Then decide the best order to put the points in, this may be different from the order in the original text. Number the points in this order.

V. Leave out unnecessary details: e.g. lists, figures, explanations.

FIRST DRAFT

VI. Edit your first draft: check the spelling and grammar, count the number of words. If you have many fewer words than the limit, you have probably left out something important, so check the original text again. If you have more than the limit, look for ways of combining points in one sentence or of omitting words here and there.

FINAL DRAFT

Your summary should consist of three logical and coherent parts: an introduction, the main part and conclusions. Connecting the points with link words is recommended. Here are some of them:

- hence, consequently, therefore, so, but, accordingly;
- firstly, secondly, on the one hand... on the other hand, etc.

(Taken from *The Basics: A Rhetoric and Handbook*)

Task 4. 43. Translate some more information about how to write a good summary. Are there any new hints compared to what you have read above? Discuss everything you know about writing summaries in small groups or with a partner.

When conducting a research on a particular issue students are encouraged to work with the primary and secondary sources of information. Primary sources of information include interviews, observations, and questionnaires, while secondary sources comprise books, magazines etc. Once the research has been completed and all relevant information has been gathered, it needs to be summarized.

Writing a Summary

"Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires...that every word tell." . . .

(William Strunk.)

Writing a summary is the process of condensing and shortening a particular text, but preserving its overall meaning. Summarizing serves the following purposes:

- (1) To demonstrate understanding of a reading;
- (2) To establish the ideas to be discussed;
- (3) To inform a reader unfamiliar with the text.

Writing a good summary requires not only good reading comprehension, but also the ability to find the main idea of the text and the most relevant supporting information. Summaries are substantially shorter (up to 75 percent) than an original text. In a good summary, a student conveys the main idea of an article or a book and, thus, saves a reader the time needed to read the entire original.

Practical Recommendations for Writing an Effective Summary

In order to write a good summary a student should begin with mentioning the source and the author of the text. It is extremely important that a student states the author's main idea without distorting it or adding his own comments. Moreover, a student should use his own words when writing a summary. However, when a particular phrase in the original is especially striking or interesting, a student may decide to use it in his summary, but should always put quotation marks around the phrase.

The first step in writing a summary is to divide a text into paragraphs. The next step is to label each paragraph with a subheading indicative of the paragraph's main idea. If several headings address similar subjects, a student may group them together under one heading. Finally, the last step in writing an effective summary is to use the list of subheadings and groupings as a roadmap which highlights the main points of the article.

Additional tips on writing an effective summary:

(1) A summary should be written in the present tense. The rationale behind this rule is to acknowledge that the author's ideas continue to exist even though the author has finished writing about them.

(2) A writer should periodically remind his reader that he is summarizing someone else's ideas by using such phrases as: "the article states that", "the author goes on to say that...", etc.

(3) A writer should revise his writing at least two times.

(4) A writer should proofread his summary and edit it ruthlessly as, according to Meister Elkhart's famous saying, "Only the hand that erases can write the true thing."

(Adapted from P.Sebranek. "A Student Handbook for Writing and Learning")

Task 4. 44. Following the above mentioned tips make a summary of the text assigned by the teacher as your home reading (or of a scientific article) in 200 words.

Task 4. 45. Translate the following information into English, using a dictionary. Then use it while working on the special text assigned to you for home reading.

Реферат – це скорочений письмовий виклад суті реферованого матеріалу.

Основні вимоги до реферату в цілому такі:

- 1) об'єктивний виклад реферованого оригінального матеріалу, тобто виклад лише тих даних та фактів, які містяться в оригіналі;
- 2) повнота викладу, тобто фіксування всіх суттєвих положень оригіналу;
- 3) єдність стилю, тобто використання тих самих мовних засобів, єдності термінології, скорочень тощо.

Відомі два основні прийоми скорочення тексту: **компресія і супресія**.

Компресія – це скорочення тексту за допомогою більш економних мовних (лексичних, граматичних, стилістичних) засобів тощо. Форма викладу – реферат, яким є конспективний виклад суттєвих положень тексту оригіналу в цілому.

Текст такого реферату складається з трьох частин: вступу – introduction (вихідні дані), опису (виклад основної ідеї і всіх суттєвих положень оригіналу) та заключної частини – conclusions (основні висновки по тексту в цілому).

В рефераті статті викладається суть оригіналу за планом, який може не співпадати з планом побудови оригінального тексту. При цьому перекладач не повинен давати власну оцінку змісту оригінального матеріалу.

В такому рефераті ілюстрації або залишаються в тексті, або описуються.

Об'єм реферату – приблизно 2000 друкованих знаків.

Одним з видів такого реферату (до 200 слів) є експрес-інформація.

Супресія – це скорочення тексту шляхом усунення з нього другорядних деталей, повторень, загальновідомих фактів, багатослів'я, образних порівнянь тощо.

Форма викладу – реферат як технічний переклад окремих суттєвих частин тексту оригіналу.

Реферативний переклад використовується в процесі обміну науково-технічною інформацією при обробці матеріалів, що не потребують термінового використання, але мають певну практичну і потенційну цінність для спеціалістів.

Отже, реферативний переклад – це повний письмовий переклад наперед відібраних частин оригіналу, які складають зв'язний текст. Такий переклад в залежності від потреб коротший від оригіналу в 5-10 разів. В процесі роботи над ним вимагається усунення всієї зайвої інформації.

Робота над реферативним перекладом складається з таких етапів:

- 1) попередньо ознайомитись з оригіналом, з проблемою, технологією; уважно прочитати текст; усно перекласти статтю;

- 2) розмітити текст за допомогою квадратних дужок для вилучення його другорядних частин та повторень;
- 3) прочитати останню версію з метою усунення можливих симілових диспропорцій та неув'язок;
- 4) зробити повний письмовий переклад частин оригіналу поза дужками. Цей переклад повинен бути зв'язним текстом, побудованим на цій же логічній основі, що і оригінал.

Task 4. 46. Read the text and answer the questions that follow:

Paraphrasing, quoting and plagiarizing are activities that involve the use of someone else's ideas, but whereas paraphrasing and quoting are legitimate writing strategies, plagiarizing is a serious offense.

To paraphrase means to summarize someone else's ideas in your own words. To quote means to copy information from another source and enclose it in quotation marks in your paper.

When you paraphrase and quote be sure to cite the source of your information. If you do not cite the source, then you are plagiarizing. You are stealing the ideas and using them as your own.

(Adapted from *PRACTICE EXERCISES
for the Test of English as a Foreign Language* by Pamela J. Sharpe)

1. What are the three writing strategies mentioned in the text?
2. What do they have in common?
3. What is the difference between them?
4. When are quotation marks used?
5. Is it obligatory to cite the source you take information from?
6. When is it considered that you are stealing the ideas?

Task 4. 47. Get acquainted with the following information on paraphrasing and discuss it in small groups. How do you understand the quotation? Use the information practically while working on writing a review of the text assigned by the teacher.

Paraphrasing

"Adam was the only man who, when he said a good thing, knew that nobody had said it before him."

Mark Twain

Paraphrasing requires using one's own words to state someone else's ideas and words. This process resembles translating; however, unlike translating, paraphrasing involves writing in the same language and restating someone else's ideas. One might use paraphrasing to make a text easier to understand and remember or to change the style or the language of the original. Unlike a summary which requires shortening an original text, paraphrasing does not typically alter the length of the original.

Practical Recommendations on Paraphrasing:

1. Carefully read a sentence for several times, cover it and try writing from memory using your own words;
2. Begin a sentence differently and change as many nouns, verbs, adjectives and adverbs as possible without departing from the original meaning of the sentence;
3. When paraphrasing, think not only about the meaning of a passage but also about its tone. If a writer is sarcastic, funny or angry, your paraphrase should reflect that sarcasm, humor or anger;
4. Break one long sentence into shorter ones or combine ideas in short sentences into a longer one;
5. Use active voice because it is more direct and vigorous than passive voice. For example, write "I shall always remember my first visit to Lviv" instead of "My first visit to Lviv will always be remembered";
6. Put statements in positive form in order to avoid hesitation and noncommittal language. For example, write "He usually came late" instead of "He was not very often in time";
7. State each important idea as clearly and briefly as possible;
8. Arrange ideas in logical order;
9. Put quotation marks around words and phrases taken directly from the source.

(Adapted from: P. Sebranek. *A Student Handbook for Writing and Learning*)

SECTION VI. EXTENDED READING

Task 4. 48. Read the text that follows and single out helpful hints for making a successful presentation. Prepare a presentation on the topic.

HOW TO PRESENT A PAPER AT A MEETING

By Herbert Gottlieb

- (1) Over 100 papers were presented at the winter meeting in Chicago. The topics varied greatly in the quality and time of presentations. They ranged from gifted teaching that held the audience *spellbound* (зачарований) at the edges of their seats to *incoherent mumbling* (незв'язне бурмотіння) and a *listless* (байдужий) dull manner that could be tolerated only by an *overcourteous* (занадто ввічливий) audience.
- (2) With the availability of advanced abstracts and concurrent session, the audience, by its very presence, expresses the interest in the topic you will present. Don't

- disappoint them. In preparing your paper a small amount of extra preparation will be appreciated. Without this, only those who have a special need for the information and those who are too tired to move to another room will remain.
- (3) Unfortunately, not everyone is a born teacher. For many speakers a reminder calling attention to some of the basic rules of effective delivery can be helpful.
- (4) The first and most urgent requirement is that you have something new and relevant to say to an audience. Next, consider the steps you can take to make sure that your presentation produces the desired effect.
- (5) **Prepare your talk in advance.** Ten minutes is sufficient to present only one big idea in sufficient detail for most of the audience. Those who wish more detail can get it during questioning period that follows each presentation, or can correspond with you after the meeting. At the *leisurely pace* of 130 words a minute, a 10-minute paper should contain no more than 1300 words. This would occupy approximately six full pages of *double-spaced typing* (*друкованій текст з подвійною відстанню між лінійками*) with good wide *margins* (*поля*). If slides, *overhead transparencies* (*прозірки для використання на проектори*) are included, limit your paper to five typewritten pages or less. Some speakers feel that if they prepare too much material, they merely need to read faster. Don't try it! You may finish your paper, but few in the audience will finish with you.
- (6) **Rehearse the presentation.** When the entire paper has been written out, edit it *mercilessly* (*без жалю*) to delete any unnecessary words or phrases that *detract* (*відволікти*) from the main idea. Then rehearse it several times using a tape recorder or a sympathetic listener.
- (7) If you find it impossible to include all of the essential details in the *allocated* (*виділений*) time, here is a trick that you can try. Leave out a whole section of your presentation, but just give enough information to the audience interested. Then, at the end of the paper, the additional information can be worked in while answering questions from the audience. If, on the other hand, the audience does not express enough interest to ask questions, perhaps it is better that the material was left out.
- (8) Some people feel that a word-for-word reading of a carefully composed paper is a poor practice since it lacks the warm personal and human touch of an *extemporaneous* (*імпровізований, зроблений без підготовки*) delivery. They argue that one might do better by obtaining a copy of the paper and save the expense of attending a conference where such papers are read *verbatim* (*дослівно, слово в слово*). Others feel that extemporaneous papers should be *banned* (*заборонені*) because speakers do not keep timing.
- (9) To achieve a balance between a well-composed paper that is dulled by reading and an extemporaneous paper that suffers from poor planning and unnecessary repetition, try for the ideal situation. Carefully compose the paper. Then, rehearse it so well that you are able to look at the audience during the delivery and give them the feeling that the presentation is extemporaneous.

- (10) Always include an introduction and a summary. Even if a paper is only 10 minutes long, it is wise to spend a minute introducing the topic by showing how it fits into the subject matter and another minute at the end for a summary of the main points. This is well expressed by the *adage* (*ευτρία*). "Tell them what you are going to tell them. Tell them. Then, tell them what you told them."

Task 4. 49. Read and translate the text using the dictionary, if necessary, and answer the questions that follow:

21ST CENTURY WORD PROCESSORS: WHAT WILL THE WORD PROCESSOR OF THE FUTURE BE LIKE ?

Consider two propositions. First, word processors have improved by leaps and bounds since their advent more than a dozen years ago. Second, what we actually do with word processors has not changed very much in the last decade. Both these statements may be true, but they create a tension: if the technology has been so revolutionary why should things remain pretty much as they always were?

One resolution to this slight conundrum is that the revolution has not yet begun in earnest. So far we have been watching a dress rehearsal : word processing is going to change radically in the next decade, and will make a huge difference to the way we write and think about writing. The improvements to the technology of word processing witnessed so far are preparatory to the really significant changes which will make us look at language and computing in a new light.

These changes are unlikely to come about through the gradual accretion of even more features to the already excellent packages in the market. Several software innovations which are already hovering on the edge of the mainstream will blossom over the next five or ten years. These innovations will create niches for newcomers and simultaneously force the major packages to focus on the parts of the language software which they are best at. We will recognize that there is much more to language processing software than the rather similar functions covered by the best contemporary word processing packages.

SPEECH PROCESSING. It seems highly likely that speech processing will move more into the mainstream of personal computing. As ever with innovation, it may not happen in quite the way we first imagined. When speech processing was first mooted five years ago, it was seen as a way of circumventing the keyboard. Some of us have trouble with basic typing, and nearly all of us have difficulties with rarely-used command sequences or macros. While we look forward to the day we can instruct our machines to "print three copies", significant applications for speech processing are likely to appear before we get reliable automatic dictation machines. We will incorporate speech messaging well before we crack the problem of unconstrained speech recognition.

Most of the documentation that moves around corporations and between businesses is remarkably standard. The average document comes in about five almost-identical versions: five copies, agenda, schedules, minutes, 'blind' copies sent to collea-

gues, action copies sent to subordinates and so on. The five copies generally differ only in their destination and minor detail. A problem with such documentation is that it tends to be regarded as dross by its recipients even if it is in fact important. An ideal way of giving apparent dross a high 'impact factor' is to attach a voice message to some e-mail.

Incorporating sound bites in documents may seem a superficial addition to the basic word processing function. But it is in line with the tendency towards object-oriented programs and user interfaces, hypertexts and multi-media documents. And all the powerful trends in the technology will encourage us to think of word processing as much broader than the typing or typesetting functions predominant in today's word processing and desktop publishing programs. While word processing will encompass voice and graphics, we can also count on an equally strong tendency towards a more abstract and artificial view of the document as 'structured program'.

The drive to uncover structure in documentation is already very strong in the defense industries. We have all heard the story about the documentation for Boeing 737 weighing more than the airplane itself or the American frigates which carry more tons of paper than they do tons of missiles. But this mass of paper is no joke for the industries which build these machines, and they are consequently taking the lead in developing powerful tools for the automatic processing and interpreting of documentation.

SGML. One of the keys is the development of Standard Generalised Markup Language (SGML) schemes: SGML allows for documentation manipulation which is independent of the particular way in which the document has been processed or represented – on paper, screen, or magnetic tape, for example. SGML has a real pay-off when you are dealing with large amounts of text. In typesetting or desktop publishing systems there is no way of distinguishing the italic into which you cast the title of a book from the italic you use for a foreign word.

But in SGML systems these differences are marked. The basic idea is that if you can treat the structure of documentation as abstract and *declarative* rather than being *procedural* and dependent on the manner of its representation, it should be much easier to make large-scale comparisons of documents. SGML markup is not easily intelligible to the human eye – quite the reverse, as it tends to look like a jumble of brackets and codes.

But new software will use SGML while concealing it from the user in much the same way as our word processors now use and exchange ASCII without our needing to notice it. SGML will come into its own when users are able to incorporate documents, standard form contracts or advertising brochures into their databases, agreement files or catalogues without needing to consciously translate the structure to the formats they prefer to use.

1. What's the tension implied in the two propositions? You could begin your answer with: On the one hand, ...
2. To what extent is word processing revolution under way?
3. What may result from the software developments in word processing?
4. What was the original idea behind the development of speech processing?
5. What is seen as the major difficulty with the use of standard documentation?

6. What is thought to be the solution to this problem?
7. Which two examples of the documentation problems facing industries are given in the text?
8. Name the ways in which documentation can be represented.
9. Describe the differences in textual representation which are said to be 'marked' in SGML.
10. Is SGML markup easily understood by the user ?
11. Explain the comparison that is made between SGML and ASCII.
12. Have we witnessed any new developments in the field of word processing recently? If so, provide some comments.

Task 4. 50. Read and translate the text with a dictionary.

About Writing

1. The writing process has four stages: prewriting, drafting, revising and editing.
2. In the **prewriting** stage you gather information for your writing project by:
 - a. **Writing down** what you know about your subject.
 - b. **Interviewing** people who know about your subject.
 - c. **Researching** your subject in books, articles, and other materials.
3. Your **rough draft** is the first version of your writing project in which you outline your ideas and decide on a central idea.
4. You then **revise** your draft several times adding details and making your writing clearer and better organized.
5. In the **editing** process you correct errors in grammar, spelling, punctuation, and so on, and you **proofread** your final version to make sure it is free of errors.
6. As you write, you will discover what you know about your subject (perhaps more than you thought), what you still need to find out, and what is important to you.

Prewriting consists of the following steps:

1. Write down what you already know about your subject by:
 - a. **Listing** a few broad ideas that come quickly to mind.
 - b. Recording information through **focused freewriting**, writing on a chosen subject nonstop for five or ten minutes.
 - c. **Brainstorming** by asking questions that bring to mind details you can use.
2. Gather any additional information you need by:
 - a. **Summarizing** another writer's ideas.
 - b. **Interviewing** people who know about your subject.
3. Express your essay's **central** (or main) **idea** in a **thesis statement** – a clear sentence expressing the point you want to make.
4. Decide or **focus** on a central idea:
 - a. Determine your purpose in writing about the topic you have chosen.
 - b. Find the main point you want to make.
 - c. Select the details you want to include.

5. Limit your discussion so that you can support your thesis with enough details to be convincing.
6. Revise your central idea as often as you need.

II. Drafting

1. Review your information dropping and adding details to keep your thesis clear and convincing.
2. Write a scratch outline keeping your working thesis in mind and grouping details under headings that organize them.
3. Prepare a rough draft.
 - a. Write as much information as you can about each section of your outline.
 - b. Don't be concerned about spelling, paragraph structure or other such details *at this point*.

III. Revising

1. As you review your rough draft, ask yourself:
 - a. Does my thesis statement still express my main point?
 - b. Are all the details I have included necessary?
 - c. Should I rearrange paragraphs?
 - d. Should I move material from one paragraph to another?
 - e. Does any paragraph need more details?
 - f. Are my introduction and conclusion interesting?
2. Revise your rough draft in the light of your answers to these questions.
3. Now ask your questions again and revise, revise, revise.

IV. Editing

1. Edit your final draft. Check all sentences individually and correct them.

(Adapted from
"The Basics: A Rhetoric and Handbook"
McGraw-Hill, Inc.)

APPENDIX. KEYS TO THE TASKS

TAPESCRIP OF THE TEXT FOR LISTENING COMPREHENSION. Why Study Technical and Professional Communication?

Why should engineers, scientists, and other technical professionals study technical writing or speaking? Their primary training and interests lie in technical areas; most science and engineering students successfully pursue their technical subjects without extra writing courses; and practicing engineers and scientists in government and

industry work on technical projects. It might seem, then, that writing and communication are superfluous to a technical education.

In fact, this is not the case. Scientists and engineers may be technically brilliant and creative, but unless they can convince coworkers, clients, and supervisors of their worth, their technical skills will be unnoticed, unappreciated, and unused. In a word, if technical people cannot communicate to others what they are doing and why it is important, it is they and their excellent technical skills that will be superfluous. From this perspective communication skills are not just handy; they are critical tools for success, even survival, in “real world” environments.

Every technical person stands to gain from improving his or her communication skills. Most scientists and engineers work in organizational settings where teamwork is essential. Good teamwork is impossible without good communication. And those scientists and engineers who work independently have to communicate with clients, sponsors, or other interested parties. For many technical professionals, the ultimate product of their work is a written document. If that document is badly written, it reflects badly not only on the individual involved but on the entire organization. Organizations know this, of course, and sometimes base hiring and promotion decisions on writing ability. To maximize your chances for landing a good job and doing well at it, you should work on your communication skills – even if you think they’re already pretty good. Communication will become even more important as you progress through your career; the better you are at it, the more likely you are to be promoted.

(Taken from *Technical Writing and Professional Communication For Nonnative Speakers of English*. N. Huckin, Leslie A. Olsen. 1991 by Mc Graw-Hill, Inc).

Keys to Task 4.7.

In fact, this is not the case. Scientists and *engineers* may be technically brilliant and *creative*, but unless they can convince coworkers, clients, and *supervisors* of their worth, their *technical skills* will be unnoticed, *unappreciated*, and unused. In a word, if technical people cannot *communicate to others* what they are doing and why it is important, it is they and their *excellent* technical skills that will be superfluous. From this perspective communication skills are not just handy; they are *critical tools* for success, even survival, in “real world” *environments*.

UNIT 5. AT A SCIENTIFIC CONFERENCE

Dear friends,

Being students, you show a keen interest in a certain field of science. And, of course, you know perfectly well that scientific conferences provide an opportunity for experts to exchange new information and fresh ideas. Sooner or later you will also take part in a scientific conference. That is why, it will be useful for you to get acquainted with the vocabulary, procedure and etiquette of conferences.

Task 5.1. Answer the following questions:

1. Have you ever taken part in a scientific conference?
2. If so, where was it held? If not, where would you like it to be held?
3. Can you express your thoughts and ideas clearly when speaking or writing?
4. Can you present your ideas to others convincingly?
5. Can you easily identify the most essential information when listening to a speech?
6. Do you willingly voice your opinion and participate in discussions?
7. Do you think students should be taught presentation skills?

SECTION I. AURAL COMPREHENSION

Task 5.2. Listen to the text “A Letter from London” and say whether the following statements are false or true:

1. Helen often goes on business trips and scientific missions.
2. The Organizing Committee holds conferences once a year.
3. The conferences are always held in London.
4. Speakers are not allowed to present their papers in their native language.
5. Helen had some problems with filling in the questionnaire.
6. Helen liked the presentation made by a famous Japanese scientist.
7. Roman’s presentation wasn’t accompanied by the demonstration of visual aids.

8. At the panel discussion the audience paid much attention to the question raised by Helen.
9. Helen doesn't want to deal with people who are against her ideas.
10. The Organizing Committee failed to arrange social events for participants.
11. The next conference will be held in Austria.
12. Helen liked the conference very much.

Task 5.3. Listen to the text “A Letter From London” and fill in the gaps with suitable words and phrases:

1. I have managed to find ___ to all of them.
2. Every year the Organizing Committee appoints and approves ___ of the conference.
3. The speakers are allowed to present ___ in their mother tongue.
4. It took me another hour to put my paper ___.
5. As I had paid ___ by mail, I had only to fill in the registration form in ___.
6. The first speaker at the ___ was a famous scientist from Japan.
7. I cannot comment on the ___ of his paper as my ___ turned out to be defective.
8. He was busy arranging his ___ on a special board.
9. Roman's ___ was brilliant.
10. My presentation at this conference wasn't an ___.
11. I took the floor at the ___.
12. At the closing meeting the ___ announced that the next conference would probably be held in Vienna.

Task 5.4. Listen to the dialogue “Presentations” and select the most accurate statements:

1. A. Person A participates in conferences once a year.
B. Person A is used to participating in conferences.
C. Person A has no experience in taking part in conferences.
2. A. Plenary presentations are delivered to all participants.
B. After plenary presentations participants discuss some specific issues.
C. All participants must make reports at the plenary meeting.
3. A. Paper reportings aren't followed by a discussion.
B. Handouts and audio-visual aids help presenters to convey the main ideas of their papers to the audience.
C. Paper reportings are usually 5-minute-long.
4. A. At workshops 15-minute reports are delivered.
B. At workshops participants try to find a solution to the problem under consideration.
C. At workshops participants listen to the leader of the group delivering a lecture.
5. A. Poster presentations are exhibited in the Conference Hall.
B. Poster presentations aim at exchanging ready-made materials.
C. Posters exhibited in the Conference Hall contain abstracts of all papers delivered at the conference.

Task 5.5. Listen to the dialogue ‘‘Presentations’’, answer the following questions, and match English and Ukrainian equivalents given below :

1. What is a plenary presentation?
2. Where may specialists discuss some specific issues of their interest during a conference?
3. What have you learnt from this dialogue about paper reportings?
4. Why are workshops intended for creative persons?
5. Where are poster presentations exhibited?
6. What does a poster presentation consist of?
7. What may participants do attending swap shops?

A.

1. workshop;
2. talks;
3. swap shop;
4. panel discussion;
5. plenary presentation;
6. general discussion;
7. paper reporting;
8. poster presentation.

B.

1. дискусія спеціалістів;
2. стендова доповідь;
3. загальна дискусія;
4. секційна доповідь;
5. тематичні бесіди;
6. (практичний) семінар;
7. секція обміну матеріалами;
8. пленарна доповідь.

SECTION II. USE OF THE ESSENTIAL VOCABULARY

Task 5.6. Memorize the essential vocabulary and translate the sentences containing it:

1. **abstract of a paper / report** – (тези доповіді) – a short written statement of the most important ideas in a paper (report), e.g. Abstracts which don't meet the requirements will not be included in the Conference Papers Book.
 2. **accept** (antonyms: **refuse, reject, decline**) – (прийняти; антоніми: відмовитися від, відхилити) – to agree // not to agree to do something that someone asked you to do, e.g. I've decided to accept the invitation to this conference, but my colleague has declined it.
 3. **agree** (antonym: **disagree with**) – (погоджуватись; антонім: не погоджуватись) – to have / not to have the same opinion about smth. as someone else, e.g. I agree with some ideas expressed by this speaker, but disagree with others.
- agreement** (antonym: **disagreement**) – (згода; антонім: незгода) – a situation in which people express similar / different opinions about smth., e.g. There is a lot of disagreement among specialists about approaches and solutions to the problem under consideration.

4. **announce** – (оголошувати) – to tell people officially about a decision or something that will happen, e.g. The chairman announced that the panel discussion would be postponed.
announcement – (оголошення) – a public (official) statement, e.g. I've already received a copy of the first announcement about the up-coming conference.
5. **arrange / compile** – (укласти, упорядкувати) – to put smth. in a particular order or position, to organize or make plans, e.g. The Organizing Committee has arranged all the papers submitted according to sections.
6. **attend a plenary meeting / session** – (бути присутнім на пленарному засіданні) – to be present at the formal meeting organized for all participants to a conference, e.g. He has failed to attend the plenary meeting but is sure to take part at the workshop.
7. **bulletin / notice board** – (дошка оголошень) – a board on which written announcements are put up, e.g. As a rule, the notices fixed to the bulletin board contain some additional information concerning the conference.
8. **chair** – (головувати) – to be in charge of a meeting, e.g. To chair the meeting means to direct its work and be responsible for its efficiency.
chairperson / chairman / chairwoman – (головуючий, -а) – the person who is in charge of a meeting, e.g. The chairman said that those requirements were to be followed by all presenters.
9. **clarify one's point of view** – (роз'яснити свою точку зору) – to make something clearer and easier to understand, e.g. Will you please clarify your point of view?
10. **comment on** – (коментувати) – to express an opinion about someone or something, e.g. The speech given by the famous guest-speaker has been widely commented on.
11. **consider** – (роздивати, вважати) – to think about something, especially about whether to accept or do something, e.g. Before reaching a final decision, we'll consider any reasonable offer.
consideration – (роздив) – careful thought and attention, e.g. Have you got any comments on the problem under consideration?
12. **deadline** – (крайній термін / строк) – a date or time by which you have to do or complete smth., e.g. They haven't established the deadline for submitting applications yet.
establish / meet / miss the deadline for doing something – (встановити крайній термін / вкластися в термін / не вкластися в термін) – to set the date / to finish by the date / to fail to do smth. by the established date, e.g. The suggested deadlines were difficult to meet.
13. **discuss** – (обговорювати) – to talk about smth. in order to exchange ideas and make decision, e.g. They had a chance to discuss a great number of bright ideas.
general / panel discussion – (загальна дискусія / дискусія спеціалістів) – not detailed / professional discussion, e.g. A panel discussion is a conversation in which a group of people with skills and special knowledge give advice or opinions on a particular subject.
prolong / postpone / interrupt a discussion – (продовжити / відкласти / перервати дискусію) – to make a speech, report or discussion last longer / to change to a later time or date / to stop someone from continuing a discussion, e.g.

The chairman may prolong, postpone or interrupt discussions.

14. **doubt** – (сумніватися, сумнів) – to think that smth. may not be true / a feeling of being uncertain about something. e.g. I don't doubt his taking part in the next conference.
15. **earphones** – (навушники) – electrical equipment that you put over your ears to listen to a radio, music etc., e.g. Participants are provided with earphones to listen to synchronous interpretation into major languages.
16. **emphasize** – (підкреслювати, робити наголос) – to point out, to give special or additional importance to smth. e.g. He made a speech emphasizing the importance of applying obtained theoretical results to practice.
17. **enclose** – (містити, покласти у конверт) – to contain; to put something inside an envelope, e.g. I was sent a letter enclosing the programme of the conference and a copy of preliminary registration form.
18. **enlarge on a problem** – (зупинитись на проблемі детальніше) – to provide more facts or details about something you have already mentioned, e.g. He was asked to enlarge on this problem.
19. **exchange / swap, swop** – (обмінюватись) – to interchange ideas and points of view, e.g. You can exchange your programmes, or assignments for ready-made materials of other participants.
20. **fail to do something** – (не зуміти / не змогти зробити щось) – to be unsuccessful in smth. that you want to do, e.g. But for the logical structure of his paper, he would have failed to convey the main ideas of it to the audience.
21. **be in favour of** (antonym: **to be against**) – (бути за / бути проти) – to completely approve of smth./disagree with an idea, e.g. Who is in favour of the motion? Who is against it? Who has abstained from voting?
22. **fill in / complete a form in block letters** – (заповнити бланк друкованими літерами) – to write all the necessary information on an official document in capitals, e.g. The participant has filled in the registration form using block letters.
23. **take the floor** – (взяти слово, виступити) – to speak at an important meeting, conference etc., e.g. She took the floor and voiced her opinion on the problem under discussion.
give the floor – (надати слово) – to allow smb. to make a speech at a meeting, conference etc., e.g. The presenter was given the floor for the second time in order to enlarge on this subject.
24. **go on a business trip / scientific mission** – (їхати у ділове / наукове відрядження) – to leave for some other place to participate in business or scientific events, e.g. He goes on business trips quite often.
25. **handout** – (роздатковий матеріал) – a piece of paper with information which is given to the audience, e.g. I prepared the handouts in advance not to waste time during my presentation.
26. **hold a conference** – (проводити конференцію) – to organize, to run, to make all necessary arrangements, e.g. The conference will be held in July.

27. **synchronous interpretation** – (синхронний усний переклад) – the act of simultaneous translation of a speech orally from one language into another, e.g. Synchronous interpretation at international conferences is provided in order to avoid the difficulty of understanding a speech (or a report) delivered in a non-working language of the conference.
28. **introduction** – (вступ) – the opening section of a paper preceding its main part, e. g. Don't omit the introduction, because it will be rather difficult for the audience to concentrate on the main ideas of your paper.
29. **invite to** – (запрошувати) – to ask someone politely to do smth. or participate in smth., e.g. How are participants invited to a conference?
- invitation** – (запрошення) – a written request to someone inviting him/her to do smth. or participate in smth. e.g. Shortly afterwards, he got an invitation to participate in a scientific conference.
30. **limit** – (обмежувати) – to restrict in time, e.g. The chairman suggested that the time of presentations should be limited to 10 minutes.
31. **location of a conference / venue** – (місце проведення конференції) – a particular place of holding a conference, e.g. The precise location of the conference is indicated in the letter of invitation.
32. **be mistaken** – (помилюватись) – to misunderstand, to have a wrong opinion of smb. or smth., e. g. I have thought I saw her enter the conference hall, but I was mistaken.
33. **merit** – (вартість, заслуга, позитивна якість) a good quality that deserves praise or admiration, e.g. The merit of any speech greatly depends on its logical and clear structure.
34. **omit a passage / paragraph** – (оминути уривок / абзац) – to leave out a short part of a speech either deliberately or through forgetfulness, e.g. If you have to omit several paragraphs, be selective and organize the content of your report in a proper way.
35. **pay a fee** – (сплачувати внесок) – to pay a charge for participation in a conference, e.g. You should pay the fee as soon as possible.
36. **preliminary programme** – (попередня програма) – introductory or preparatory, preceding the more important programme, e.g. The preliminary programme is to be sent to all participants tomorrow.
37. **present** – (представляти) – to introduce formally, to give a speech in which you offer an idea, plan, etc. to be considered or accepted, e.g. You should present your paper in relatively short and simple sentences to be easily understood by the audience.
- presentation** – (виступ, представлення) – a speech in which a new idea, plan, etc. is described or explained, e.g. He's been asked to give a short presentation on the aim of the project.
- presenter** – (доповідач) – someone who gives a speech on a particular subject, e.g. If you are a presenter, you should submit the title and the abstract of your paper.

- 38. questionnaire entry** – (пункт анкети) – an item in a written set of questions drawn up for collecting information, e.g. Participants are to fill in the questionnaire comprising more than 20 entries.
- 39. receive / send a formal invitation / a receipt** – (отримувати / надсилати офіційне запрошення / квитанцію) – to get or obtain / to mail or transfer a written request or acknowledgement, e.g. Yesterday I received the formal invitation to the conference.
- 40. register** – (реєструвати,-ся) – to record (to write) a name and other details about someone on an official list, e.g. How many participants have already registered?
registration – (реєстрація) – the act of putting names and other details on an official list, e.g. Students' registration for participation in the annual scientific conference will have been completed by March 1.
- 41. see that strict timing is kept** – (чітко слідкувати за регламентом) – to regulate one's time of presentation in accordance with limits adopted, e.g. The meeting was over late in the evening because the chairman failed to see that strict timing was kept.
- 42. speaker** – (виступаючий, доповідач) – someone who makes a speech, gives a talk etc., usually at a meeting, e.g. It's very important for a speaker to develop key points of his presentation in an interesting and varied way.
- 43. summary** – (висновок, короткий зміст, резюме) – a short statement that gives the main information about smth. without giving all the details, e.g. Please write a one-page summary of this report.
- 44. visual aids** – (унаочнення, наочні засоби) – something such as a map, picture, film, etc. that helps people understand, learn or remember information, e.g. If you have a lot of complex information to explain, think about using some visual aids: charts, graphs, diagrams etc.
- 45. voice one's opinion on** – (висловити свою думку) – to tell people one's thoughts or feelings on a particular subject, e.g. He voiced his own opinion on the subject under discussion.
- 46. wander from the subject under debate** – (відхилятися від теми дебатів) – to talk about something not connected with the main subject, e.g. It's the function of the chairman to control that speakers do not wander from the subject under debate.
- 47. working language** – (робоча мова) – language in which papers should be presented to the audience, e.g. Being one of the most wide-spread languages in the world, English is often chosen as a working language at international conferences.

Task 5.7. Revision of the essential vocabulary of the previous topics. Fill in the blanks with proper forms of the words:

1. **to apply for** (подати заяву) ; **application** (заява)
- a) I think we should ____ for participation in this conference.
 b) I'm afraid his ____ will be declined.

2. to manage to do something (зуміти щось зробити)

Have you ___d to meet the deadline for submitting the abstract of your paper?

3. to solve problems (вирішувати проблеми); **to find a solution to the problem under consideration** (знайти вирішення проблеми, що розглядається)

a) They failed to find any ___ to this problem.

b) The committee had to ___ many problems when organizing the conference.

4. to meet (met, met) requirements (відповідати вимогам)

His paper doesn't meet publication ___.

5. to participate / to take part (брати участь); **participation** (участь); **participant** (учасник)

a) Have you ever ___d in a scientific conference?

b) The ___s who came to the conference from other cities will stay at a three-star hotel.

c) He missed the deadline for submitting the application, so his ___ in the conference is out of the question.

6. to submit / present / deliver a paper (report) (подати / представити / прочитати доповідь)

He ___ed his paper at the plenary meeting and then ___ed it to the Organizing Committee for publication.

Task 5.8. Match the words with their definitions:

1. Presentation

a) happening before something that is more important;

2. Enclose

b) a piece of paper with information given to people
who are attending a meeting, conference etc.;

3. Requirement

c) not to include something;

4. Decline

d) to put off an event, action etc. until another time;

5. Preliminary

e) someone, who is in charge of a meeting;

6. Deadline

f) to put smth inside an envelope in addition to a letter;

7. Fee

g) the amount of money that you pay to do smth;

8. Questionnaire

h) a folder containing some documents;

9. Handout

i) a short statement that gives the main information;

10. Postpone

j) an event at which a new idea is explained;

11. File

k) something that is needed or asked for;

12. Chairman

l) to refuse to accept smth;

13. Summary

m) a date by which you have to complete smth;

14. Omit

n) a written set of questions which you give to a large number

of people in order to collect information;

Task 5.9. Complete the words to match definitions given:

- | | |
|---|-------------------------|
| 1. A public statement | a _ _ o u _ _ _ m _ n t |
| 2. To be in charge of a meeting | c _ _ _ r |
| 3. A written request to someone inviting him/her to do smth. or participate in smth. | _ _ v i t _ _ _ o n |
| 4. To restrict in time | l _ _ i _ |
| 5. Careful thought and attention | c _ _ _ _ e _ _ t _ _ n |
| 6. To think that smth. may not be true | d _ _ _ t |
| 7. Electrical equipment that you put over your ears to listen to a radio, music, etc. | _ a _ p h _ _ _ s |
| 8. A situation in which people express similar ideas | a _ _ e e _ _ _ t |
| 9. The opening section of a paper preceding its main part | _ _ t _ _ u _ _ _ o _ |
| 10. A good quality that deserves praise or admiration | m _ _ _ _ |
| 11. Someone who makes a speech, gives a talk etc., usually at a meeting | _ _ _ a _ _ r |

Task 5.10. Fill in the gaps choosing the words from the list given below:

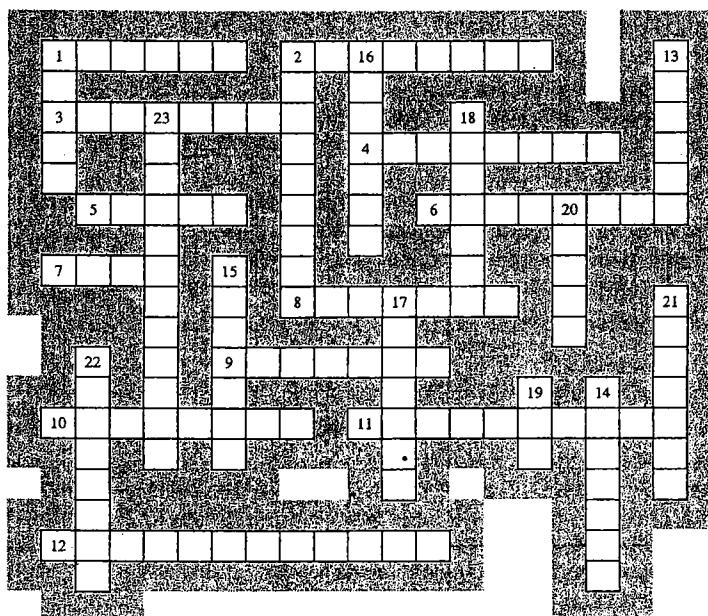
Requirements, title, emphasized, fee, presentation, enclose, handout, preliminary, deadline

1. I've been asked to make a short ... on the aims of the project.
2. The ... is very difficult to meet.
3. We hope that his presentation will meet all the
4. Please ... the completed application form.
5. Have they arranged the ... programme yet?
6. ... materials will be distributed among participants before the meeting.
7. What is the ... of your paper?
8. He suggests that the registration ... should be reduced.
9. It should be ... that this problem requires further investigation.

Task 5.11. Match each word or phrase in Section A with one of an opposite meaning in Section B:

- A.** 1. to accept; 2. to fail; 3. to meet the deadline; 4. formal; 5. to be in favour of; 6. agreement; 7. to doubt; 8. to pay a fee; 9. to attend; 10. to send; 11. to prolong a discussion.
- B.** 1. to charge a fee; 2. disagreement; 3. to interrupt a discussion; 4. to be sure; 5. to receive; 6. to be absent; 7. informal; 8. to decline; 9. to manage; 10. to be against; 11. to miss the deadline.

Task 5.12. Do the crossword puzzle, translating the following words into English:



Across

1. приймати
2. обмінюватись
3. реєструвати(ся)
4. матеріал
5. вартість, заслуга
6. крайній термін
7. надсилати, відправляти
8. виступаючий, доповідач
9. висновок, короткий зміст
10. оголошувати
11. запрошення
12. реєстрація

Down

1. погоджуватись
2. навушники
13. відмовити(ся)
14. обговорювати
15. представляти
16. коментувати
17. упорядкувати, скласти, організувати
18. отримувати, приймати
19. сплачувати, платити
20. обмежувати
21. проти
22. розглядати, вважати
23. вступ

Task 5.13. Rearrange the following jumbled words and phrases to form sentences:

1. the International / next / to be held / Lviv / conference / summer / is / in/ dedicated to / microelectronics.
2. by / the Organizing Committee / has been sent / form / enclosing / the letter / a / registration / preliminary.
3. form / letters / in / are asked / participants / to fill in / block / a / to a conference / as a rule.
4. deadline / abstracts / is / the / submission of / 21 May / for.
5. take the floor / opinion / participant / voice / may / his / every / and.
6. debate / wander / not / the subject / from / should / under / speakers.
7. leader / workshops / activity / a / are aimed at / the / guided by / participants'.
8. to avoid / are / working languages / appointed / the problems / international / barriers / conferences / of / language / at.
9. and / application / the papers / computer technologies / achievements / dealt with / presented at / their / the latest / the conference / in.
10. in a certain / provide / to share / scientific conferences / for experts / of knowledge / fresh ideas / field / and discuss / an opportunity.

SECTION III. APPLIED GRAMMAR**Task 5.14. Revision of grammar. Translate the following mini-dialogues into English using sentences with Complex Subject as in the model:**

Model:A. – You are said to have been on a scientific mission to London.
B. – Quite so. But you seem to have made a business trip as well.

1. A. – Відомо (to know), що він отримав офіційне запрошення на цю конференцію.
 B. – Так. Але він, напевно (to be sure), відмовиться від нього.
2. A. – Маломовірно (to be unlikely), що Організаційний комітет вже отримав тези твоєї доповіді.
 B. – Так. Але припускається (to suppose), що вони почнуть упорядковувати програму конференції наприкінці наступного місяця.
3. A. – Повідомлялось (to report), що попередня програма буде надіслана всім учасникам завтра.

- B. – Саме так. Але, здається (to seem), вона ще не надрукована.
4. A. – Кажуть, що цей лист містив бланк попередньої реєстрації.
 B. – Саме так. Але сталося так (to happen), що секретарка його загубила (to lose/lost/lost).

Task 5.15. Revision of grammar. Translate the following mini-dialogues into English using sentences with Complex Object as in the model:

Model: A. – Has the Organizing Committee demanded the participants to mail the registration fee?

B. – No, it hasn't. I saw a participant pay the fee at the registration.

1. A. – Чи він хотів, щоб його доповідь була надрукована наступного тижня?
 B. – Hi. Він сподівався (to expect), що я надрукую її завтра.
2. A. – Чи реєстратор думав, що ваша група є представниками (representatives) України?
 B. – Hi. Він припускав (to suppose), що ми приїхали з Канади.
3. A. – Чи реєстратор примусив (to make) учасника заповнити бланк ще раз?
 B. – Hi. Він дозволив (to let) йому виправити помилку у заповненому бланку (completed form).
4. A. – Чи головуючий попросив (to request) Катрін представити її звіт робочою мовою конференції?
 B. – Hi. Я чув, як вона читала свій звіт французькою мовою.
5. A. – Чи Роман вважає (to consider) деякі пункти анкети недоречними (irrelevant)?
 B. – Hi. Він вважає (to find) іх цілком доречними (quite appropriate).
6. A. – Чи ти помітив (to notice), як Майкл зайшов у конференційний зал?
 – Hi. Я бачив, як він читав оголошення на дощці оголошень.

Task 5.16. Revision of grammar. Make up mini-dialogues as in the model:

Model 1: – Could she go on the scientific mission last month?

– No, she couldn't. And she can't do it now. But she will be able to go on the scientific mission next month.

1. you; to send the abstract of your paper; last (next) week. 2. the Organizing Committee; to arrange the programme of the conference; in August (October). 3. he; to pay the registration fee; yesterday (today, tomorrow).

Model 2: – May I look through the preliminary programme now?

– No, you may not. But you will be allowed to look through it tomorrow.

4. May I enter the Conference Hall? (after the registration)
5. May we hold the meeting today? (next Friday)
6. May they take the book of abstracts of the conference? (if they pay for it)
7. May he present the paper in his native language? (if he supplies an interpreter)

Model 3: – Must I fill in another form?

– No, you needn't. You may correct the mistake in the completed form.

8. Must I mail the registration fee? (to pay it at the registration) 9. Must we return the certificates back to the clerk? (to keep them) 10. Must he be present at all the sessions? (to attend only those he is interested in)

Model 4: – Why weren't you present at the first session?

– I couldn't. I had to stay at the hotel.

11. Why didn't Martha mail the abstract of her paper last week? (to retype it) 12. Why didn't he accept the invitation to this conference? (to carry out some extra experiments in the laboratory) 13. Why didn't they register in the morning? (to spend the night at the airport, as the flight was delayed)

Task 5.17. Revision of grammar. Put questions to the underlined words:

1. The next conference on environmental pollution will be held in Vienna.
2. Presenters usually deliver their papers in the working language of the conference.
3. The registration fee may be paid both by mail and at the registration.
4. They managed to find a solution to the problem under consideration.
5. Having got acquainted with the content of the poster, he discussed it with the presenter.
6. Readers can reread the passages difficult for understanding.
7. The participant has taken the floor to voice his opinion and enlarge on the subject.
8. The merit of any presentation greatly depends on the logical and clear structure of the paper.
9. The hand-outs were copied and distributed among the participants in advance.
10. The time of presentations should be limited to ten minutes.

Task 5.18. Grammar – Oblique Moods. Fill in the gaps with correct forms of the verbs given in brackets:**Conditional Mood: should (would) + Infinitive without particle “to”**

1. He ___ to enlarge on this problem. (to like) 2. But for your help, I ___ the deadline for submitting the abstract of my paper. (to miss) 3. If you had used some visual aids, your presentation ___ much more interesting. (to be)

Suppositional Mood: should (for all persons) + Infinitive without particle “to”

1. It is desirable that you ___ the invitation. (to accept) 2. He requested that the chairman ___ him to take the floor once more. (to allow) 3. All the present suggested that the discussion ___. (to prolong)

Subjunctive I (formal style): identical to forms of Infinitive without particle “to”

1. The Organizing Committee required that the papers ___ on the computer. (to print)
2. It is necessary that all the participants ___ present at the plenary session. (to be) 3. The chairman insists that the speaker ___ strict timing. (to keep)

Subjunctive II: identical to forms in Past Tense (non-perfect form of the verb “to be” is “were” for all persons)

1. I wish handouts ____ yesterday. (to copy) 2. It is high time that the preliminary programme ____ to all the participants. (to send) 3. If he ____ his materials, he would have exchanged them in the swap shop. (to bring)

Task 5.19. Pattern practice. Choose the proper endings of the sentences:

Give him detailed information about the conference,

- a) so that he might(could) ...
- b) lest he should ...

1. decline the invitation to it.
2. submit the abstract of his paper in time.
3. think over the subject of his paper beforehand.
4. mix up the terms of registration.
5. forget to take all the necessary documents along with him.

Task 5.20. Revision of grammar. Use proper forms of the verbs given in brackets :

“If”-clauses of Real Condition. Model: If he has spare time tomorrow, he will tell me about his presentation.

1. If the time of my presentation (to be limited) to 5 minutes, I (to have) to omit several paragraphs of my paper. 2. If you (to deliver) your paper in simple language, the audience (to understand) its content easily. 3. If a reader (to fail) to understand this passage, he (to read) it once again. 4. If I (to receive) the invitation letter enclosing an application form, I (to give) it to you for making a copy.

“If”-clauses of Improbable Condition. Model: If he had time tomorrow after the meeting, he would talk with the chairman.

5. If there (to be) any additional requirements, the Organizing Committee (to inform) us about it. 6. If the speaker (to emphasize) the problem at the next session, the participants to the conference (to pay) attention to it. 7. If I (to feel) better tomorrow, I (to take part) in the discussion. 8. If you (need) some additional information about the conference, you (to find) it on the conference web page.

“If”-clauses of Unreal Condition. Model: If he had had time yesterday, he would have typed his report.

9. If he (to write) his paper a week ago, it (to be printed) by now. 10. If the speaker (to prepare) his visual aids for demonstration beforehand, he (not to waste) time during his presentation upon it. 11. If he (to mail) the abstract in time, his paper (to be included) into the programme of the conference. 12. If the chairman (not to let) speakers wander from the subject, the meeting (to be) over much earlier.

Task 5.21. Write sentences with subordinate clauses of unreal condition to match the following situations:

1. He didn't take part in the conference. He had no formal invitation.
2. He wasn't given earphones. He wasn't able to listen to the synchronous interpretation at the plenary meeting.
3. She lost her registration fee paid receipt. She had problems with registering.
4. The application form is filled in too illegibly. It is impossible to read a single word.
5. He didn't read the requirements carefully. He skipped several entries in the questionnaire.

Task 5.22. Pattern Practice. Make up sentences using the pattern and expressions given below:

"But for the demonstration of visual aids (= But if it had not been for the demonstration of visual aids), my presentation would have been rather monotonous".

1. The logical structure of the paper; to fail to convey the main ideas of it to the audience.
2. the lack of time; to translate the paper into two working languages of the conference.
3. your recommendations; not to know how to deliver the paper properly.
4. his carelessness; not to lose the application form.
5. sponsors; to fail to pay for computer facilities.
6. shortage of funds; to call the conference twice a year.
7. the efficient work of the editorial committee; to fail to publish abstracts of the papers in time.
8. the taxi; to be late for the opening ceremony of the conference.

Task 5.23. Fill in the gaps with proper forms:

1. It is necessary that all the participants ... abstracts of their papers in time.
a) submits; b) will submit; c) submitting; d) should submit
2. If I ... to participate in that conference, I wouldn't have gone to Warsaw to visit my friends.
a) were invited; b) am invited; c) had been invited; d) would have been invited
3. I wish I ... the workshop yesterday, because my colleagues told me it had been very helpful.
a) attended; b) were attending; c) had attended; d) had been attended
4. It is high time that the Organizing Committee ... whether to accept or decline our applications.
a) decides; b) is deciding; c) will decide; d) had decided
5. If he hadn't declined the invitation, he ... new information and ideas with other participants.
a) had exchanged; b) should have exchanged; c) would have exchanged; d) would exchange

6. All those present demanded that the speaker ... his point of view.
a) was clarifying; b) should clarify; c) will clarify; d) clarifies
7. But for the chairman seeing that strict timing was kept, some presenters ... to deliver their reports.
a) wouldn't have managed; b) wouldn't manage; c) won't manage; d) do not manage
8. It is important that all reports ... presentation requirements.
a) meets; b) met; c) will be met; d) should meet
9. If you ... some visual aids, your presentation would have been more successful.
a) used; b) have used; c) had used; d) would use
10. Though the time of the presentation was limited, Prof. Petrenko insisted that he ... allowed to enlarge on the subject.
a) is; b) will be; c) should be; d) has been.
11. I wish Prof. Donchenko ... the floor now, as tomorrow I won't have an opportunity to listen to this outstanding scientist.
a) had taken; b) took; c) take; d) will be taken.
12. The chairman insisted that the speakers ... from the subject.
a) were not wandering; b) wanders; c) shouldn't wander; d) won't wander
13. But for the synchronous interpretation, they ... to understand the main ideas presented by this famous French scientist in his report.
a) fail; b) would have failed; c) failed; d) would fail.

SECTION IV. DEVELOPING SPEAKING SKILLS

Task 5.24. Match English and Ukrainian equivalents. Then read the dialogue and answer the questions given below:

A

1. to consider an invitation
2. expenses
3. to apply for participation
4. fare
5. board
6. to decline
7. to recognize
8. to issue credentials
9. to come to be
10. to share experience

B

1. харчування
2. ділитися досвідом
3. відмовитися від, відхилити
4. опинитися
5. розглянути питання про запрошення
6. видати посвідчення про відрядження
7. подати заяву на участь
8. впізнавати
9. видатки
10. плата за проїзд

P: – Post-graduate: – Hello! Don't you recognize me?

S: – Student: – Hello! Haven't seen you for ages! You are said to have made a business trip.

P: – Right. Last month I was on a scientific mission taking part in the conference on professional ethics.

S: – How did you come to be there?

P: – Our university received an invitation from the Organizing Committee of a conference. After considering the invitation I decided to apply for the participation as I have been interested in this subject since I read "The Invisible Man", a novel by Herbert Wells.

S: – It means that anybody could take part in the conference, doesn't it?

P: – Actually, anybody could fill in the Presenter or Participant Application Form. But it was the Organizing Committee who decided whether to accept or decline the application.

S: – I see. And what is the difference between a presenter and a participant?

P: – Well, presenters deliver their papers to the audience, while participants just take part in discussions. As I was a presenter, I had to submit the abstract of my paper and other information about my presentation so that the Organizing Committee could arrange the programme.

S: – How did the Committee inform you about their decision?

P: – They sent me a letter enclosing the programme of the conference and preliminary registration form.

S: – And did the University support you financially?

P: – Yes. I received the credentials and travelling allowance from the University. The allowance covered some of my expenses, such as fare and board. Accommodation was provided by the organizers of the conference.

S: – So you've acquired a valuable experience. What about sharing it with our group?

P: – Willingly.

Questions: 1. How are participants invited to a conference? 2. How does the Organizing Committee learn about their decision? 3. What must every presenter submit to the Organizing Committee? 4. What does he or she receive in reply? 5. Do you prefer to be a presenter or a participant at a conference? Why?

Task 5.25. Read the letter of invitation and answer the following questions:

1. Has WUPASCE held any conferences before? When and where will this conference be held? 2. What types of presentations does the programme of the conference include? 3. What language should you present your paper in? 4. What is the fixed limit of time for submitting your application? 5. How would you contact the Organizing Committee of the conference (by letter, fax, or e-mail)? Why?

**WEST-UKRAINIAN PROFESSIONALS' ASSOCIATION
FOR SAFE AND CLEAN ENVIRONMENT**

2nd WUPASCE Conference

Dear colleague,

WUPASCE is pleased to invite you to participate in the 2nd WUPASCE conference

"PROFESSIONAL ETHICS"

to be held in Lviv

on 19 – 24 May.

The programme of the Conference includes plenary sessions, talks, workshops, panel discussions, and poster presentations.

The Conference will focus on the following topics:

- Technological Progress and Environmental Pollution
- Potentially Dangerous Inventions
- Protection of Nature
- Moral Aspects of Professional Ethics
- Scientists' Duties to Society

Working language of the Conference is English.

To be registered as a presenter/participant, you should fill in the Presenter/Participant Application Form (enclosed) and send it to:

Organizing Committee of the 2nd WUPASCE Conference,

55 Acid Rain Street, Room 35,

Lviv, 79013,

Ukraine

Fax: 414 – 398827, E-mail: 2ndWUPASCE.leo.ua

Detailed information on registration fees, accommodation and travel arrangement, as well as instructions concerning the format of abstracts and papers are available on the Conference Web Page:

<http://www.2ndWUPASCE.leo.ua>

Please note deadlines:

March 15

Deadline for submitting applications and abstracts of proposed papers

March 30

Acceptance mailed

April 15

Deadline for submission of full-length papers

May 5

Preliminary programme mailed

Task 5.26. Home Assignment. The letter of invitation usually encloses a form containing the information about presentations. Your personal entry in the programme of the conference will be based on this information. So you should copy the form, fill it in, and submit it to the Organizing Committee.

The 2nd-WUPASCE Conference
DETAILS OF PRESENTATION

Author (and co-authors) _____

Title of the paper (maximum 12 words) _____

Summary of the paper (maximum 50 words)

• PRESENTATION REQUIREMENTS

Form of presentation (report/talk/workshop/poster presentation) _____

Time required (for all presentations except poster presentations) /from 5 to 45 min./ _____

Equipment required (cassette player, video, overhead projector, other)

Date _____ Signature _____

Please return this form by 7 April. Thank you.

1. What is the title of your paper? 2. What is the form of your presentation? 3. How much time will you require for your presentation? 4. What equipment are you going to use?

Task 5.27. Match English and Ukrainian equivalents. Then read the dialogue and answer the questions given below:

A

1. registration officer
2. charge / fee
3. certificate
4. registration fee paid receipt
5. name-plate
6. facilities
7. folder
8. title
9. position held
10. file
11. hand-book

B

1. планка з прізвищем участника
2. (тут) обслуговування
3. комплект документів в папці
4. реєстратор
5. посвідчення
6. довідник (учасника конференції)
7. квитанція про сплату реєстраційного внеску
8. вчене звання
9. папка
10. плата / внесок
11. посада, яку ви займаєте

Participant: – Good morning. I'd like to register for the conference.

Registration Officer: – Good morning, sir (madam). Have you got the registration fee paid receipt?

P: – No, I haven't. I failed to mail the fee. But I saw a participant pay it right at the registration. May I do the same?

RO: – Yes, of course. The registration fee may be paid both by mail and at the registration.

P: – How much is it?

RO: – It will be \$150 for presenters. But for participants who don't present their papers or wish to attend the conference for one day only, there is a special charge which provides, on the chosen day, facilities equivalent to those for full-time participants.

P: – Here are three 50-dollar notes.

RO: – Thank you. Now you are to fill in the questionnaire. Please write legibly using block letters.

P: (a few minutes later) Have I completed the form properly?

RO: (looking through) Surname, first name, place of work, (work and home) addresses, telephone numbers... Write your title and position held, please. You've skipped these entries. (a minute later) Now, it's all right. Here is your certificate of registration, file (folder with handout material), name-plate, and hand-book.

P: – Thank you.

Questions:

1. What must a participant / presenter do before being registered?
2. Do all those who take part in a conference pay the same amount of the registration fee?
3. What items are handed to every presenter or participant at the registration?
4. Can any student afford to take part in international conferences without financial support? Could you suggest some ideas how to make international conferences more accessible to students?

Task 5.28. Match English and Ukrainian equivalents. Then read the dialogue and answer the questions given below:

- | | |
|-----------------|-------------------|
| 1. by the way | 1. корисна порада |
| 2. to retain | 2. завершувати |
| 3. transition | 3. хоча |
| 4. to crown | 4. до речі |
| 5. handy hint | 5. недостатній |
| 6. though | 6. перехід |
| 7. insufficient | 7. зберегти |

A: – What's the matter? You seem to be nervous.

B: – I should think so! Don't you know that I present my paper at the next session? By the way, if you have some spare time, tell me about your presentation.

A: – With pleasure. First of all, the chairman suggested that the time of presentations should be limited to 10 minutes. So I had to omit several paragraphs, but I managed

- to retain the logical and clear structure of my paper as the merit of any presentation greatly depends on it.
- B: – Yes, I know. Every paper must begin with an introduction, then the body (or the main part) is delivered, and a summary crowns the presentation.
- A: – Quite right. Though, I must admit that it is insufficient. My presentation would have been rather monotonous but for the usage of visual aids.
- B: – Tell me more about it. Who provides the equipment for demonstration of visual aids?
- A: – All the equipment (including audio- and video-cassette recorders) is provided by the Organizing Committee. I used an overhead projector (кодоскоп) to demonstrate charts and diagrams. Besides, I prepared handout materials. They were copied and distributed among the participants in advance, lest I should waste my precious time during the presentation.
- B: – I wish I had been present at that session. Have you got any other handy hints?
- A: – Yes, I have. The language of your paper should be simple and easy to understand.
- B: – Thank you. Now I know that practice is the main thing a speaker needs to present his paper properly.
- A: – Sure. And tomorrow you will have it.

Questions:

1. What are the main parts of a paper?
2. What equipment may be used for demonstration of audio-visual aids?
3. What type of equipment do you think to be most effective at conferences?
4. What is the principal requirement to the language of a paper?

Task 5.29. Role-play. Simulate the situations in the office of the Organizing Committee of an International Conference. Act out the conversations between the following persons using the phrases and information given below:

- | | |
|---|---|
| <p>A: – Could you help me, please?</p> <p>– (very formal) Will you be so kind as to...?</p> <p>– I'd like to know ...</p> <p>– I wonder whether / if ...</p> <p>– Will I be allowed to ... ?</p> <p>– May / Must / Should I ... ?</p> <p>– In what way / How should I ... ?</p> <p>– And what about ... ?</p> | <p>B: – I think you must / should ...</p> <p>– I don't think you should ...</p> <p>– I advise / recommend you (not) to ...</p> <p>– Why don't you ... ?</p> <p>– You'd better (not) ...</p> <p>– Unfortunately, you won't be able to / allowed to ... /, there won't be ...</p> <p>– You will have to ...</p> |
|---|---|

Situation 1. Conversation between

- A – an author who wants to make an oral presentation using different types of equipment; and**
- B – a member of the Organizing Committee.**

Information to Situation 1: Since the oral sessions are based on rigid time schedules, a regular lecture including discussion can last no longer than 20 minutes. The lectures should be presented in English. Kindly use short sentences, a slower pace of delivery

and clear and distinct pronunciation. This concerns specifically those presenters who speak in their mother tongue (i.e. English).

Lecture rooms will be equipped with PCs provided with diskette and CD-ROM drives (дисководы). A PC for checking presentations beforehand will be available in the Conference Reading Room. We would prefer each lecturer to bring his personal notebook. A connection to the Internet will not be available in the lecture rooms.

Overhead projectors for transparencies will be available. Attention should be paid to the preparation of sheets; be aware that it's difficult to follow overfilled transparencies (прозірки) displayed for only several seconds. It is not advisable to use complex drawings, diagrams or tables. Only a few lines should be presented on a single transparency or in a table containing written text. We recommend a graphical presentation over a tabular one. A slide projector will not be available.

Situation 2. Conversation between

A – an author who wants to make a poster presentation; and

B – a member of the Organizing Committee.

Information to Situation 2: The majority of papers will be presented as posters. Authors should try to arrange their posters in such a way as to provide a clear comprehensible image of their work at first sight even for those participants who are not conversant in this special field of interest. Authors should give preference to diagrams, pictures and charts. The text should be very concise and accentuate the particular aim of the work, its importance, practical application, and key formulas and symbols. Authors should leave details to the discussion with interested people and to the full text. The size of the poster board is 120 cm (height) by 150 cm (width). The presenters will mark their posters with a heading, containing the title and the name(s) of author(s), affiliation, city and country (size of letters – 2 cm). Letters under 1 cm are not suitable. Posting only a printout of the full text does not do credit to the sense and purpose of poster session. The presenters will arrange their posters at designated panels before the beginning of poster session. The presenters must attend their posters during the coffee break from 15:20 to 16:00.

Situation 3. Conversation between

A – a would-be chairman who has no experience in chairing the meetings at conferences, and

B – an experienced member of the Organizing Committee.

Information to Situation 3: Taking the floor for the first time, it is customary for a chairman to thank the members for placing their confidence in him by making him their chairman. After declaring the conference (session) open the Chairman greets the participants and introduces the honorary guests. If necessary, he should read the letters of apology for absence. Then the Chairman announces the agenda (порядок денний), explains in outline the work to be done by the session and asks the present to approve the time limits for reports and speeches at discussions. The Chairman's duties include: introducing speakers, directing the debates, giving the floor to participants; prolonging, postponing or interrupting the debate when necessary, putting questions and motions

(пропозиції) to vote and announcing the results of the vote. Voting is conducted either by a show of hands (відкрите голосування) or by poll (таемне). Questions arising at meetings are determined by a simple majority of the votes of the members present. The Chairman shall not take part in the debates and shall not vote, except in the cases when there is an equality of the votes. The Chairman's words are expected to be few: his address should be much shorter than any of the speeches that follow, and there should be very few personal remarks. Besides, the Chairman should see that strict timing is kept and ensure the observance of order. He/she may ask speakers to avoid repetition, not to wander from the subject under debate or ask the audience for silence and even tell a person who is guilty of disorder to leave the meeting hall. Before closing the conference the Chairman expresses gratitude (on behalf of the Organizing Committee) to the contributors, sponsors, audience, services and local administration for their help in organizing the conference.

Situation 4. Conversation between

A – a would-be secretary

B – an experienced member of the Organizing Committee.

Information to Situation 4: At a conference or a meeting the Secretary (Rapporteur) will sit close to the Chairman, and will take notes from which the minutes (протокол) must be subsequently written up. It is an advantage if the Secretary is good at shorthand (стенографія). Minutes, as a rule, show the main ideas expressed by speakers and the decisions recorded at a meeting preceded possibly by a short information dealing with the essential points leading to the decision. The reports are usually submitted to the Committee so it is not necessary to write them down in full; a reference in the minutes by which the report may be identified will usually be enough. The secretary should register the following information: (1) names of speakers and short narration of their speeches, (2) motions (пропозиції) in the precise form in which they are put by the Chairman and names of the movers of every motion, (3) questions discussed and the names of those who took part in the discussion, (4) the Chairman's decisions upon matters of order, the results of voting and statements of collective opinion regarding practice or procedure of the meeting. With the help of the above issues the secretary will have no difficulty in compiling the minutes of the meeting. If the minutes of the previous meeting must be approved by the members, it is the duty of the secretary to read the minutes to the audience. If there are any amendments (поправки) to the minutes, the secretary will insert them in proper places and, after approval, the Chairman will sign the minutes. To crown its work, any conference should compile and adopt a document based on the minutes which is called a final report or a resume of the proceeding. This document usually includes the following issues: the composition of the conference (names of all officials, participants and guests); origin of the conference and its agenda; terms, characteristics and priorities of work, organization of further research and conclusion. This final report is signed by the Chairman and the secretary. Sometimes the final report is accompanied by resolutions or appeals adopted by the conference.

(Instructions adapted from “*Conference Guide*” and leaflets of different conferences)

SECTION V. READING AND WRITING

Task 5.30. Read the text and present its contents in the form of an interview:

ORGANIZING A CONFERENCE

In the modern world people are eager to share information, discuss and solve common problems at non-governmental level. That's what conferences, congresses, round-table discussions and other forms of meetings are for. But an idea to hold a conference and its implementation are different things the latter requiring a considerable amount of time, money and effort.

The preparatory stage of holding a conference is forming the Organizing Committee which elects its chairman and assigns duties to other members. They are to determine the general theme of the conference and its component topics, as well as dates, venue, budget and other organisational questions. The most essential organizational question seems to be the one of financing. Every participant should pay a fee which includes the registration fee, payment for publication of abstracts and full-length papers, accommodation, meals and participation in social events. But for sponsors, Organizing Committees would sometimes have failed to pay for secretarial services, facilities (equipment, sound and lighting systems), the rent of premises and entertainment.

Computers have greatly facilitated the task of organizing International conferences, but still a lot of paper-work is involved unless the conference is a virtual one. For example, the Organizing Committee should arrange printing announcements, formal invitations, leaflets, brochures, handout material, conference proceedings and reports. The invitation letters usually enclose application forms to be filled in by would-be participants. After receiving the invitation you may either accept or decline it. Having accepted the invitation, you should send all the necessary documents and the abstract of your paper to the Organizing Committee for arranging a preliminary programme. If you fail to meet the deadline for submitting the abstracts, your presentation will not be included in the programme.

Should the conference take place in a foreign country, don't forget to receive a visa before going on the scientific mission. Participants are informed about the location and terms of registration by letter, by e-mail or they can find this information on the conference web site (page) in the Internet. At the registration desk a participant submits the registration fee paid receipt and fills in a questionnaire containing entries which refer to detailed information on the participant and his or her scientific activity. After the registration participants may look through the notices put up on a bulletin board in order to extract some additional information concerning the conference or make acquaintance with other participants. Though here some problems may arise because of language

barriers. That's why it is necessary that the working language (in which papers must be written and presented to the audience) should be fixed at International conferences and participants and official guests attending plenary meetings should be provided with earphones to listen to synchronous interpretation into major languages (such as English, French, German or Spanish).

No doubt, for you, the principal event at the conference is your presentation. It is very important that you should realize the difference between a written paper and its oral presentation. Readers can concentrate on subjects of interest, reread the passages difficult for understanding or omit inessential paragraphs. The audience of the conference does not have such an opportunity. So, it depends on you whether the main ideas of your paper will be conveyed to your listeners. Experienced speakers say that papers (consisting of a brief introduction, the main part and the summary which emphasizes the merits of the scientific investigation done) should be delivered in a simple language and within the fixed time limit. It is desirable that the presentation should be accompanied by demonstration of visual aids.

At most sessions presentations are followed by discussions or debates. Any participant may take the floor, comment on the papers, and voice his/her opinion or enlarge on the problem under consideration. If you are against the ideas presented by a speaker or think that he or she is mistaken, you may ask the chairman to give you the floor, express your disagreement and clarify your point of view offering convincing arguments. It's the function of the chairman to see that strict timing is kept and that speakers do not wander from the subject under debate. The chairman can prolong, postpone or interrupt the discussion.

As a rule, conferences are accompanied by exhibitions of relevant books, software and video materials. Besides, participants are invited to take part in social events, such as visiting museums and theaters, going on guided sightseeing tours.

A well-run conference not only stimulates further scientific activities of its participants, but is also of great interest to the whole scientific community. The abstracts of contributed papers are published as proceedings of the conference and distributed among the participants while full-length papers (from 10 to 20 pages) are sometimes published on CD-ROM or in special issues of scientific journals.

Task 5.31. Home Assignment. Prepare a five-minute-long paper based on the material of your home reading and present it at the conference in your group. Work on the recommendations given below:

Recommendations:

1. You should begin with addressing the chairman of the conference and the audience, e.g.
“Mr. Chairman! Ladies and gentlemen! I am greatly honoured to be invited to address this conference”.
2. Then you announce the subject of your paper, e.g.:
“I should(would) like to talk in this paper about ...”
“The subject of my paper is ...”
3. The introduction to your paper may begin like this:

“First of all, I would like to ...”

“In the introduction to my paper I should like to ...”

“Let me begin with ...”

“As many of you know...”

4. After the introduction you make a transition to the body of your paper with the help of the following sentence:

“Now, after a short (brief) introduction, I would like to turn to the main part of my paper.”

In the main part you should give the general review of the problem under consideration and then emphasize the most essential details. Here are the phrases used for logical connection of passages within the text:

“First; second; third; next; then; later; afterwards; finally (eventually); however; besides; nevertheless; moreover”.

“As I have already mentioned...”

“I want to emphasize (point out) that ...”

“Allow me to call your attention to ...”

“As an example I can suggest ...”

“As far as I know ...”

5. We recommend you to begin the summary of your paper with the words:

“Now let me review what I have said about”.

And do not forget to say “Thank you for your attention” at the end of your presentation.

Requirements:

1. In the paper you should express your opinion about the problem under consideration.

The following phrases may be used: “In my opinion / to my mind...”; “I think / believe / consider that ...”; “If I’m not mistaken...”

2. The language of your paper should be simple and understandable!

Task 5.32. Before presenting your paper to the audience read the brief instruction in presentation skills:

You should ...

1. thoroughly investigate the phenomenon or problem you are going to consider in your paper and plan your presentation thinking about your aim.
2. pay much attention to clear and logical structure of your paper.
3. organize the content identifying the main points and supporting ones and linking your ideas.
4. use simple and understandable language, vary sentence structure and length.

You shouldn’t ...

1. write your paper at the very last moment re-arranging some relevant information found in the Internet or other sources.
2. put down your ideas as they come to you.
3. present the content as a set of disconnected ideas.
4. use rare and archaic words, idiomatic expressions, extremely long sentences or short ones with similar structure.

- | | |
|---|--|
| 5. speak distinctly, stressing words and sentences correctly. | 5. mumble monotonously. |
| 6. speak slowly, maintaining eye contact with your audience. | 6. read very quickly without looking up at the audience. |
| 7. use visual aids and handout materials. | 7. mention some charts, diagrams or pictures without showing them to the audience. |
| 8. stay within time-limits. | 8. ignore time-limits. |
| 9. thank your listeners for their attention and encourage them to ask questions or make comments. | 9. leave the rostrum without thanking the audience for attention. |

Task 5.33. Discuss the papers presented by your fellow-students at the conference in your group using the following expressions:

- May I take the floor?
- I'd like to raise a question ...
- I'd like to voice my opinion on this subject ... / I'd like to comment on ...
- Would you, please, clarify your point of view?
- I'm in favour of ..., but I'm against ...
- I agree with the previous speaker to some extent, but ...
- I doubt that ...
- Could you enlarge on this problem, please?
- I'm not certain about the ideas expressed in the previous speech because ...
- I'm afraid you are wrong/mistaken.

Task 5.34. Quiz. Choose the answers that suit you, calculate your score total and read the comments:

1. You have been investigating some phenomenon or problem for a certain period of time and generated a number of original ideas. What will you do with them?
 - a) You will apply for participation in the nearest relevant conference, present your ideas to the scientific community and willingly discuss them with experts.
 - b) You will think them over again and again, then formulate them in an article and submit it to your scientific adviser for assessment.
 - c) You will browse (= look through the information in) the Internet from time to time to see whether there is anything similar to them there.
2. If you received a formal invitation to a very interesting conference held in Reykjavik, the capital of Iceland, would you ...
 - a) accept it straight away?
 - b) find out more information about the country and then consider the invitation?
 - c) decline the invitation because Iceland is too far and you think it is too cold there?

3. If the working language of the conference (you'd like to participate in) were Portuguese, would you ...

- a) accept the invitation, go to a linguistic center to get your paper translated into Portuguese and take an intensive course in this language nevertheless hoping that the Organizing Committee will provide synchronous interpretation of papers into English at the plenary meeting?
- b) contact the Organizing Committee and ask them to permit you to deliver your paper in English?
- c) decline the invitation because you are not good at languages?

4. If you were interested in the subject of a conference, but the participation fee were very high, would you ...

- a) borrow money and pay the fee?
- b) find out whether you could participate in the conference for one day only and pay less?
- c) decline the invitation because you are short of money?

5. If you took part in a conference held in London, would you ...

- a) attend all the meetings, take part in discussions and workshops and, in general, focus your attention on the conference?
- b) be selective, attend only those meetings you like and go sightseeing in spare time?
- c) deliver your paper and go shopping?

Give 3 points for every "a", 2 points for every "b", and 1 point for every "c". If the sum total is:

from 15 to 12 – You are an open-minded person eager to share your ideas with others and to know what's new in your field of science. That's why you are ready to put up with some inconveniences. Maybe in the end it will pay off. But aren't you afraid that someone will make profit using your ideas while you are so busy participating in conferences?

from 11 to 9 – You are quite a practical person. You always think twice before doing something. It's praiseworthy, but wise men say that sometimes thought kills action and as action always breeds thought, you may miss some brilliant ideas.

from 8 to 5 – Either you are not interested in participating in conferences or you are very inert and try to find good reasons to stay at home and rummage in the Internet or read books. In this case you should consider participation in virtual conferences. And we hope your mind is quicker than your body.

If you don't agree with these comments, express your attitude to conferences yourself.

Task 5.35. Write short essays concerning the following questions:

1. What are advantages and disadvantages of participating in a conference in your native town and abroad?
2. Some students are eager to take part in scientific conferences, others think that they should pay attention only to their curricular activities. Which of these opinions do you agree with? Why?

3. Do students scientific conferences have any influence on their participants' professional future?
4. What is the most essential thing to you when you are planning to take part in a conference: (1) the value of ideas presented in your paper and those of the others, (2) the amount of the registration fee, (3) the location and prestige of the conference? Why?

APPENDIX. KEYS TO THE TASKS

Key to tasks 5.2 and 5.3. Text “A Letter From London”

Dear Martha,

I am writing to you from London. I have never been on a business trip or scientific mission before, so I have had a lot of problems. However, I have managed to find solutions to all of them. But let me tell you everything in proper succession.

Two months ago our department received a formal invitation to an annual conference dedicated to environmental protection. Every year the Organizing Committee appoints and approves the location of the conference. This time the conference was to be held in London. How could I decline the invitation?! I accepted it willingly and sent the title and short abstract of my paper so that the Organizing Committee could consider my paper while arranging the programme. Several weeks later I received a letter which enclosed the preliminary programme of the conference. I packed my suitcase and left for London. And there all my troubles began.

First of all, on arriving at the hotel and unpacking my suitcase, I found that I brought only the Ukrainian text of my paper. According to the rules speakers are allowed to present their papers in their mother tongue in case they supply their own interpreters. So, all the evening long I was translating my paper into English as it was the working language of the conference. In the morning I hurried to the typing room to get the translated paper typed. The typist did her job very quickly, but she mixed up the summary with introduction, and omitted several paragraphs including the most essential passage of my paper. It took me another hour to put my paper in order. Fortunately, I was just on time to get registered. As I had paid the registration fee by mail, I had only to fill in the registration form in block letters. No doubt, I should have failed to do it, but for Roman, an acquaintance of mine, who helped me to fill in some questionnaire entries.

The first speaker at the plenary session was a famous scientist from Japan. But I cannot comment on the merits of his paper as my earphones turned out to be defective and I couldn't listen to the synchronous interpretation. Roman was to deliver his paper after the Japanese so he was busy arranging his visual aids on a special board. Of course,

Roman's presentation was brilliant. It met all the requirements. Roman didn't wander from the subject under consideration and kept strict timing. I should like to be as accurate as Roman. But I have never been able to stay within time-limits, I have always tried to voice my opinion as completely as I could. And my presentation at this conference wasn't an exception. Before I had time to clarify my point of view and enlarge on the problem, my time-limit was up. But I took the floor at the panel discussion, raised the same question and managed to evoke the audience's interest in the problem to such an extent that the chairman had to prolong the discussion. If I'm not mistaken, all the present were in favour of my ideas. Though I must tell you that I prefer to deal with people who disagree with me as, to my mind, verbal controversy with an opponent allows you to consider the problem from a different view-point and stimulates constructive thinking.

The cultural programme of the conference was excellent, but I couldn't visit museums and go sightseeing as after the panel discussion I caught a cold and had to stay in bed for two days watching TV and reading newspapers.

At the closing meeting the chairman announced that the next conference would probably be held in Vienna. I suggest that we both should apply for participation in it. I'll ring you up as soon as I return to Lviv, and we'll talk it over.

Yours Helen.

P.S. Don't pay attention to my having emphasized the shady side of the journey, my general impression of the conference is highly favourable.

Key to tasks 5.4 and 5.5. Dialogue “Presentations”:

A: – Can you help me?

B: – With pleasure. What's the problem?

A: – I'm participating in the conference for the first time. And the programme includes so many types of presentations that I don't know which session to attend.

B: – A-ha. So you want me to describe each type of presentation, don't you?

A: – Exactly. Let's begin with plenary presentations (плenарні доповіді).

B: – OK. Those are reports that are made at the plenary meeting for all participants. And, if I'm not mistaken, they are not followed by a discussion.

A: – Oh, it's boring! I'd like to discuss papers and to comment on them.

B: – Then you should attend talks (тематичні бесіди) or panel discussions (дискусії спеціалістів). They consist of a 10-minute-long formal presentation and a 5-minute discussion. In other words, these are sessions for a group of specialists to discuss some specific issues of their interest.

A: – No, it's too narrow. I prefer general discussions.

B: – I see. Then let us consider paper reportings (секційні доповіді). It usually takes a presenter 15 minutes to deliver his/her paper. The presentations are supported by handouts and audio-visual aids. After the reportings the participants ask questions.

A: – Just to ask questions?! Well, I thought we gathered here to find some new approach or solution to the problems under consideration!

B: – Now, I know. You are a creative person, so workshops (практичні семінари) are intended especially for you. A workshop has very little lecturing. The main emphasis is laid on the participants' activities under the guidance of a leader. They solve some problem or develop a research technique during the session.

A: – It sounds much better! But look, the programme also includes poster presentations and swap shops. What are they?

B: – Poster presentations (стендові доповіді) are held in the Conference Hall. On entering the hall you will see several posters (with brief texts accompanied by photos or charts) on display. You may get acquainted with the content of any poster and discuss it with the presenter. While in a swap shop (секція обміну матеріалами) you may exchange your materials (such as programmes, assignments, etc.) for ready-made materials of other participants.

A: – That's great! I'm sure not to go back home empty-handed. Thank you for the information.

B: – You are welcome.

UNIT 6. PROFESSIONAL ETHICS

Task 6.1. Discuss the following questions in small groups and then report the conclusions of your discussion to the class.

I.

1. What do you know about professional ethics of a specialist?
2. How do you understand human responsibility of a scientist?
3. Do you agree or disagree with the statement that science and technological progress have nothing in common with humanistic ethical values? Give specific reasons to support your answer.
4. Do you believe in the existence of absolute values?
5. What absolute values can you mention?
6. Could the spiritual pollution which we face today be as dangerous as the material one?
7. How can knowledge of ethical values and professional ethics influence our life?

II.

1. What do you know about global warming and greenhouse effect?
2. What can you say about supplies of fresh water worldwide?
3. Do you think that poor land use such as clearcutting forests, draining wetlands causes destruction of ecosystems? Give extended answers.
4. How can loss of plant and animal species influence our life?

SECTION I. AURAL COMPREHENSION

Task 6.2. Before listening to the discussion of some ethical problems try to match the following English words and word combinations with their Ukrainian equivalents:

- | | |
|-------------------------------------|----------------------|
| 1. spiritual situation in the world | 1. підняті питання |
| 2. a due question | 2. байдужість |
| 3. to achieve democracy | 3. людські цінності |
| 4. improvement of society | 4. чинити благородно |

5. solve the problems	5. винагорода
6. predominant	6. стан духовності у світі
7. spiritual sense of purpose	7. досягти демократії
8. appreciation of genuine spiritual values	8. розв'язати проблеми.
9. raise a question	9. висока оцінка справжніх духовних цінностей
10. act nobly	10. відсутність моральної мети
11. alienation	11. відчуження
12. illegal drugs	12. несправедливість
13. injustice	13. покарання
14. apathy	14. вдосконалення суспільства
15. lack of moral purpose	15. що переважає, пануючий
16. reward	16. наркотики
17. punishment	17. постійний процес
18. permanent process	18. духовне відчуття мети
19. human values	19. доречне запитання

Task 6.3. Listen to the discussion and answer the following questions:

1. Is democracy an important first step in the improvement of society?
2. What is the way of improving the spiritual situation in Ukraine?
3. Do all men act nobly?
4. What are the enemies of our home?
5. How can these enemies be conquered?
6. What factors are very important in moral training?

Task 6.4. Comprehension test. Listen to the text “Global warming and greenhouse effect” and decide whether the following statements are *True* or *False*, then tick your answer:

№	True	False
1. Human activities are responsible for extreme changes in the Earth's temperature.	1).	
2. All the solar energy is absorbed on the Earth's surface.	2).	
3. Carbon dioxide and methane are greenhouse gases.	3).	
4. We do not need a greenhouse effect.	4).	
5. The increase of concentrations of greenhouse gases rises the Earth's surface temperature.	5).	
6. Carbon dioxide can remain in the atmosphere for hundreds of years.	6).	
7. Methane stays in the atmosphere for more than ten years.	7).	
8. The greenhouse effect is not necessary to keep the liquid state of water on the Earth.	8).	

Task 6.5. Listen to the text once again and fill in the gaps with suitable words and phrases.

1. Human activities are responsible for the ___ in Earth's temperature.
2. Changes in Earth's temperature cause global warming and major changes in ___.
3. Two thirds of the solar energy ___ inside the atmosphere.
4. Some gases in the atmosphere which trap solar energy, ___ and ___ it are called "greenhouse gases".
5. Carbon dioxide ___ from burning fossil fuels.
6. ___ may be a major source of nitrous oxide.
7. Fluorocarbons ___ occur naturally.
8. A greenhouse effect provides a ___ of warmth enveloping Earth.
9. A nitrous oxide molecule traps heat about 200 ___ more effectively than a carbon dioxide molecule.
10. Without a natural ___ the temperature of Earth would be ___ 18° C.

SECTION II. USE OF THE ESSENTIAL VOCABULARY

Task 6.6. Read the essential vocabulary and translate the sentences:

1. **advertise** – рекламиувати; to announce, e.g. Alcohol and cigarettes should not be advertised.
advertisement / advert / ad – оголошення, реклама; announcement; TV commercial, notice, e.g. The publication of the results in mass media is an advertisement for the products manufactured by this company.
2. **be aware** – усвідомлювати; to be conscious of, e.g. A scientist should be aware of his responsibility to his country.
awareness – усвідомлення, обізнаність, знання; consciousness of, e.g. Spiritual pollution can be seen in the lack of awareness of sense of life.
3. **ban** v. – забороняти; to forbid, veto, reject, restrict, e.g. The government has banned the use of chemical weapons. n. заборона; prohibition, taboo, e.g. Our country should put a ban on the import of nonstandard products.
4. **claim** – 1. вимагати; 2. претендувати; 3. amer. заявити, твердити; to demand, ask for, require, e.g. Plato claimed that among absolute values are justice, humanism, love, wisdom and conscience.
5. **conscience** – совість, сумління; moral sense, principles, sense of right and wrong, ethics, e.g. Justice, humanism, love, wisdom and conscience are the main laws of the science of ethics.

6. **consequence** – 1. наслідок, результат; 2. висновок; 3. важливість, значення; 1. result, outcome; 2. conclusion; 3. importance, significance, e.g. For centuries consequences of the technological progress for the environment were not taken into consideration.
7. **cruel** – 1. жорстокий; 2. болісний, тяжкий; 1. brutal, inhuman; 2. unkind, painful, heartless, e.g. Before the industrial revolution workers had been cruelly exploited.
- cruelty** – жорстокість; brutality, e.g. Lack of moral purpose might be caused by cruelty.
8. **damage** n.– 1. шкода; 2. пошкодження; harm, ruin, e.g. Now we must find ways to develop industry with as little damage to the environment as possible. v. завдавати збитків; пошкоджувати; to harm, ruin, destroy, e.g. Lots of farms have been badly damaged by spring floods.
9. **dangerous** – небезпечний, загрозливий; risky, insecure, unsafe; threatening, e.g. The spiritual pollution which we face today may be as dangerous as the material one. **danger** – небезпека; risk, threat, e.g. Illegal drugs are a great danger to our society.
10. **depletion** – виснаження (озонового шару), вичерпування (запасів); exhaustion, reduction, decrease, e.g. Nowadays the depletion of the ozone layer is one of the major problems of the environment.
11. **destroy** – руйнувати, знищувати; to ruin, wipe out, e.g. Industry has destroyed the environment.
- destruction** – руйнування, знищення; ruination, wiping out, e.g. One of the problems we must solve today is the destruction of atmosphere.
12. **eliminate** – 1. усувати (помилки і т. ін.); 2. знищувати; to remove smb./smth. that is not wanted or needed; to get rid of smth., e.g. The nuclear threat is not yet completely eliminated.
- elimination** – усунення; liquidation, exclusion, removal, e.g. The elimination of the consequences of Chornobyl tragedy will take decades.
13. **emerge** – 1. з'являтися, виходити; 2. виявлятися, з'ясовуватися; 1. to appear, come out; 2. to become known, e.g. The mismatch which emerged between the technological progress and humanism caused labour dehumanisation.
- emergence** – поява; appearance, e.g. The emergence of new technology sometimes damages the environment.
14. **encourage** – підбадьорювати, заохочувати; to give hope to, inspire, persuade, reassure, support, e.g. Science should be encouraged.
- encouragement** – заохочення; approval, reassurance, e.g. Students need encouragement of their parents and teachers.
15. **entertainment** – 1. розвага; 2. вечірка; 1. fun, enjoyment, recreation, pastime; 2. show, concert, play, e.g. Some people think only of money and entertainment.
16. **environment** – довкілля, оточення, середовище; surroundings, conditions, atmosphere, e.g. All the countries should unite their efforts to save environment.

- 17. greediness** – жадібність, ненажерливість; an excessive desire for wealth; being grasping, materialistic, mean, selfish, money-grubbing, e.g. Spiritual pollution manifests itself in greediness of society.
- 18. harmful** – шкідливий, згубний; bad, damaging, dangerous, ruinous, unfavourable, unhealthy, unpleasant, e.g. Some products are harmful to the health of consumers.
- 19. insurance** – страхування, забезпечення; protection, security, e.g. Child labour was banned, insurance and pensions were introduced.
- 20. judge** – 1. судити, виносити вирок (рішення); to assess, criticize, evaluate, examine, consider, determine, estimate, guess, suppose, e.g. The decision on whether to develop the bomb can only be judged by ethics.
judgement – 1. судження, думка, погляд, 2. розсудливість, здоровий глупзд; conclusion, decision, e.g. The judgment about the danger of spiritual pollution is absolutely correct and more people begin to understand it.
- 21. justice** – 1. справедливість; 2. законність, правосуддя; 1. right; 2. morality, law, e.g. It was actually a campaign for social justice.
- 22. manifest** – 1. робити очевидним; 2. обнародувати; 3. виявляти; to show, make evident, make obvious, e.g. Spiritual pollution manifests itself in everyday life.
manifestation – прояв; display, show, expression, declaration, demonstration. e.g. Alcoholism is a manifestation of the lack of culture.
- 23. match** v.– підходити, відповідати; to be equivalent, be the same, be similar, coincide, correspond, e.g. Thermal solar panels will perfectly match your new environmentally friendly house. n.-рівня, пара; equivalent, e.g. These energy efficient light bulbs and electronic environmental controls are an excellent match for our modern homes.
- 24. pollute** – забруднювати; to contaminate, poison, e.g. Everyday burning of litter pollutes our cities.
pollution – забруднення; contamination, poison, dirtiness, impurity, e.g. Environmental pollution is the major threat to our survival.
- 25. promote** – сприяти, допомагати; to help, support, e.g. We should promote ethical norms based on ultimate values.
promotion – сприяння; help, support, advancement, assistance, contribution to, backing, sponsoring, e.g. Healthy way of life demands banning tobacco promotion.
- 26. realm** – галузь, сфера, царина; sphere, branch, world, field, area, e.g. Today we need a second humanization – in the realm of environment.
- 27. replace** – замінити; to change, renew, restore, e.g. Nowadays environmental pollution has replaced nuclear war as the major threat to our survival.
- 28. suggest** – пропонувати; to advise, propose, e.g. You should suggest more energy saving features in the design of new buildings.
suggestion – пропозиція; advise, proposal, e.g. Their suggestions are quite clear: absolute values exist and some values are more important than others.
- 29. survive** – вижити; to stay alive, continue to exist, e.g. To survive when the air, the earth and water are so dangerously polluted is quite a problem.

- survival** – виживання; continued existence, e.g. Poor land use decisions make our survival more difficult.
30. **tailor** – пристосувати до (чогось); to fit, suit, adapt, adjust, e.g. There are cases when the results of scientific investigation are tailored to the needs of the company which sponsors this investigation.
31. **threaten** – погрожувати, загрожувати; to put at risk, endanger, e.g. We should promote ethical norms in order to solve the problems which threaten the world today.
threat – загроза; danger, hazard, e.g. Deforestation is a serious threat to the survival of animal habitat.
32. **value** – цінність, важливість; the worth of sth; importance, significance, e.g. Science and technology, by themselves, are not a source of ethics and values.
values [pl] – цінності; moral or professional standards of behaviour; principles, e.g. Young people have a different set of values from their parents.
ultimate values – вічні, основні, первинні цінності; basic, fundamental, primary, e.g. The question of existence of ultimate values has been discussed for centuries.
33. **violate** – порушувати (закон і т. ін.); to breach, ignore, e.g. Have you ever violated the laws of the society?
violation – порушення; contravention, infringement, offence, e.g. Another ethical problem that should be considered by scientists is violation of the rights to intellectual property.
34. **wisdom** – 1. мудрість, 2. розуміння; 1. common sense, good sense, insight, penetration, perceptiveness, rationality, reason; 2. understanding. e.g. He is a man of great wit and wisdom.

Task 6.7. Match English words with their Ukrainian equivalents:

- | | |
|---------------------|--------------------------|
| 1. justice | a) усувати |
| 2. to violate | b) замінити |
| 3. realm | c) вічні цінності |
| 4. conscience | d) вичерпування(запасів) |
| 5. absolute values | e) пошкодження |
| 6. threat | f) виживання |
| 7. to eliminate | g) мати на увазі |
| 8. depletion | h) справедливість |
| 9. insurance | i) забороняти |
| 10. to ban | j) совість, сумління |
| 11. damage | k) загроза |
| 12. to bear in mind | l) порушувати (закон) |
| 13. to replace | m) проявляти(-ся) |
| 14. to manifest | n) царина |
| 15. survival | o) наслідки |
| 16. consequences | p) страхування |

Task 6.8. Arrange the following words in groups of synonyms:**A.**

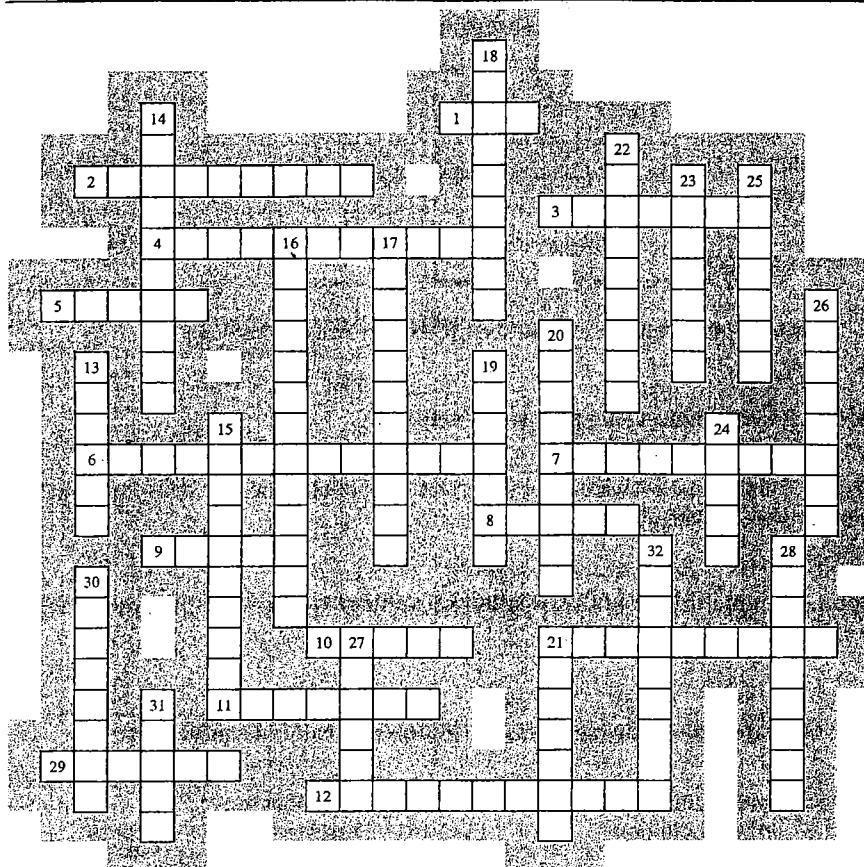
1. cruel
 2. ban
 3. awareness
 4. emerge
 5. realm
 6. harmful
 7. promote
 8. tailor
 9. threaten
 10. conscience
 11. justice
 12. destruction
 13. replace
 14. manifest
 15. encourage
 16. insurance
 17. damage
 18. suggest
 19. wisdom
 20. claim.
1. appear
 2. moral sense
 3. ruination
 4. brutal
 5. right
 6. change
 7. bad
 8. show
 9. protection
 10. understanding
 11. put at risk
 12. advise
 13. demand
 14. harm
 15. consciousness of
 16. help
 17. fit
 18. sphere
 19. forbid
 20. give hope to

B.**Task 6.9. Do the crossword puzzle translating the words given below into English:****Across:**

1. забороняти,
2. небезпечний,
3. замінити,
4. наслідок, результат,
5. жорстокий,
6. оголошення, реклама,
7. страхування,
8. претендувати,
9. судити,
10. галузь, сфера,
11. пропонувати,
12. руйнування,
21. забруднення,
29. пристосувати до (чогось).

Down:

13. шкода,
14. совість, сумління,
15. жадібність,
16. розвага,
17. довкілля,
18. обізнатість,
19. правосуддя,
20. усувати (помилки),
21. сприяти,
22. вичерпування (запасів),
23. шкідливий.
24. підходити, відповідати,
25. руйнувати,
26. робити очевидним,
27. з'ясовуватися,
28. підбадьорювати,
30. виживання,
31. цінність,
32. порушення закону.

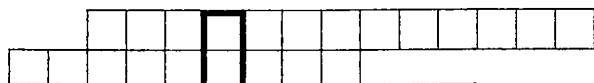


Task 6.10. Read the words and decide which of them do not belong to each group of four items:

1. ban/veto/demand/forbid
2. result/outcome/consequence/conscience
3. destroy/risky/unsafe/dangerous
4. come out/emerge/come in/appear
5. common sense/understanding/wisdom/wise
6. fit/tailor/suit/change
7. bad/harmful/damaging/pleasant
8. judgment/protection/security/insurance
9. coincide/respond/much/match
10. show/hide/make evident/manifest

Task 6.11. Write a synonym to each word in the grid:

1. announcement



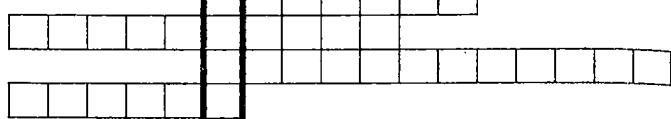
2. contamination

3. damaging

4. moral sense

5. results

6. moral principles

**Now look at the grid. Can you see the extra word? What is it?****Task 6.12. Form nouns, using the proper suffixes:**

Advertise, eliminate, be aware, cruel, encourage, pollute, greedy, dangerous, judge, promote, insure, violate, emerge.

Task 6.13. Find in the list of the essential vocabulary words with the same form for the verb and for the noun.**Task 6.14. Match the following phrases with their Ukrainian equivalents:**

1. to be completely misguiding
2. to face spiritual pollution
3. to ease the labour
4. things worth admiring
5. first and foremost
6. to bear in mind
7. inner moral world of a man
8. rights to intellectual property
9. nuclear threat
10. global warming
11. to maintain living standards
13. short term well-being
14. lack of awareness of sense of life
15. drug-abuse
16. to shape a better world
17. to think only of wealth and entertainment

- A. тимчасовий добробут
- B. права на інтелектуальну власність
- C. потепління на земній кулі
- D. полегшити працю
- E. думати лише про багатство та розваги
- F. мати на увазі
- G. відсутність усвідомлення сенсу життя
- H. зловживання наркотиками
- I. стикатися з духовним забрудненням
- J. ядерна загроза
- K. речі, якими варто захоплюватись
- L. внутрішній моральний світ людини
- M. насамперед
- N. створити кращий світ
- O. підтримувати життєвий рівень
- P. повністю вводити в оману

Task 6.15. Complete the phrases with the words given below:

1. the results of scientific ...;
2. violation of the ...;
3. short-term ...;
4. of the ozone layer;
5. consequences were not taken ...;
6. ultimate ...;
7. ...a better world;
8. lack of ... of sense and purpose of life;
9. ways to ... living standards;
10. should be created and applied for ...;
11. human ... of a scientist;
12. science ... the environment;
13. to fill technological progress with ...;
14. should bear ...;
15. the major ... to our survival;

values, responsibility, in mind, has destroyed, investigation, shape, maintain, the good, ethical values, depletion, into account, threat, human rights, awareness, well-being.

Task 6.16. Fill in the gaps choosing the words from the list presented below:

damage, threat, value, survival, virtues, realm, approach, damage, consequences, banned, depletion, threat, manifestation, absolute values, survival.

1. Among her many ... are loyalty, courage and truthfulness.
2. His research has been of little practical
3. Large areas of the Carpathian forests are now under the ... of destruction.
4. Don't you realize the ... these chemicals are doing to our environment?
5. A lot of small companies are having to fight for
6. It was Plato's statement that ideal forms exist in ... of values just as ideal forms exist in geometry and logic.
7. The humanistic ... to science is wonderfully described in the works of thinkers and scientists of the past and present time.
8. The nuclear ... is not yet completely eliminated.
9. ... of the ozone layer is one of the modern problems of the environment.

10. Child labour was ... during the second half of the 19th century and in the 20th century.
11. The ... of the technological progress for the environment were not taken into consideration.
12. Now we must find ways to maintain living standards in industrially developed countries with as little ... to the environment as possible.
13. The mismatch which emerged between the technological progress and humanism caused such problem as ... of man in the nuclear century.
14. Plato claimed that justice, humanism, love, wisdom and conscience are the ...
15. ... of the spiritual pollution which we face today, may be as dangerous as the material one.

Task 6.17. Rearrange the following jumbled words to form the sentences.

1. be responsible, invention, must, scientist, a, for, his.
2. about, responsibility, scientist, past, of, the, human, philosophers, a, of, wrote, the.
3. values, in, mind, absolute, scientist, a, ethical, must, bear.
4. realm, Plato, exist, in, ideal, of, values, stated, that, the, forms.
5. "categorical imperative", E. Kant, ethics, the, understood, as.
6. justice, laws, conscience, main, the, are, humanism, ethics, and, of, wisdom.
7. good, scientist, for, should, be, invention, the, applied, the, of, mankind, a, of.
8. health, harmful, may be, the, consumers, products, some, to, of.
9. today, world, threaten, the, a lot of, problems.
10. war, is, eliminated, threat, not yet, the, of, nuclear, a.
11. global, survival, in, century, the, nuclear, main, problem, the, is, a.
12. today's, solving, the, environment, task, is, problems, the.
13. threat, pollution, our, environmental, survival, is, to.
14. need, humanistic, progress, to fill, with, ethical, values, we, scientific, technological.
15. spiritual, dangerous, may, as, the, one, pollution, material, the, be, as.
16. process, formation, long, is, permanent, of, the, human, values, and.
17. great, the, education, role, of, in, humanization, processes, is, very, the.
18. based, are, ultimate, ethical, norms, values, such, justice, as, wisdom, freedom, on, etc.
19. to shape, a, it, world, for, is, our, duty, us, better, all, of.
20. important, good, training, is, very, in, moral, education.

SECTION III. APPLIED GRAMMAR

Task 6.18. Pair work. Study the following tense forms in Active Voice.

Simple Tenses			Continuous Tenses		
1. Present	2. Past	3. Future	4. Present	5. Past	6. Future
V V _s	V _{ed}	shall/will + V	am is + P _{ing} are	was + P _{ing} were	shall/will be + P _{ing}
Perfect Tenses			Perfect Continuous Tenses		
7. Present	8. Past	9. Future	10. Present	11. Past	12. Future
have + P _{ed} has	had + P _{ed}	shall/will have + P _{ed}	have been + P _{ing} has been	had been + P _{ing}	shall/will have been + P _{ing}

Read the following statements and think what tense form you should use for each one. Match it with the appropriate number of the tense in the table above. Give your own examples.

1. The action is happening at the time of speaking.
2. You talk about things in general.
3. Somebody was in the middle of doing smth. at a certain time. The action had already started before this time but had not finished.
4. The action in the past has a result now.
5. A temporary situation.
6. A permanent situation.
7. You have already arranged to do smth.
8. Things happen repeatedly.
9. An activity that has recently stopped or just stopped.
10. You are in the middle of doing smth.
11. You talk about timetables, programmes etc.
12. You decide to do smth. at the time of speaking.
13. Something had been happening for a period of time before something else happened.

14. One thing will be complete before the other.
15. Your plans are fixed like a timetable.
16. You talk about things happening now.
17. You talk about past time.
18. Something is true in general.
19. You do something too often, more often than generally.
20. One thing happened after another.
21. You are predicting the future.
22. You talk about changes happening now.
23. The period **this morning** is not finished at the time of speaking.
24. You will be in the middle of the process of doing something.
25. Personal arrangements.
26. You talk about things that happened *before* a certain time in the past.
27. You talk about the completed action in the future.
28. You are thinking of the present result of the action.
29. Things happened a long time ago and there is no connection with the present.
30. A sentence begins with "**It's the first time he...**".
31. Something will be completed before another future action.
32. This tense tells us only about the *past*.
33. You predict a future happening or situation.
34. You give new information or announce a recent happening.
35. You talk about a period of time that continues from the past until now.
36. An action will begin before a definite moment in the future, will continue up to that moment and will be going on at that moment.

Task 6.19. Put the verbs in brackets into the correct tense (The Simple Present, the Present Continuous or the Present Perfect in Active or Passive Voice).

1. Scientific research (to claim) to be the source of the high standard of living in the country.
2. Since there is an increasing number of people in the country who (to suffer) and (to die) as a consequence of cigarette smoking, the parliament (to adopt) laws banning advertisements for cigarettes.
3. If climate changes (to continue), the world will suffer the consequences.
4. Injustice (to manifest) itself in our everyday life.
5. In many ways our society (to struggle) to restore moral values in an increasingly lawless and godless age.
6. The safety of this medicine (not to be proved) yet and we are not sure that it (not to cause) damage to the liver.
7. When my business is not going well, he (to encourage) me, telling me not to give up.
8. Even the most security-conscious computer user or whiz-kid (to be) under constant threat from computer viruses.
9. They just (to sign) an international agreement aimed at halting the destruction of the ozone layer.

10. Worldwide, the scientists (to study) now the chemical reactions that cause ozone destruction.
11. The industry's chemical seepage and waste (to cause) untold damage to the environment lately.
12. Acid rain (to destroy) animate nature and (to corrode) buildings.
13. What they have found could supply clues to what might happen worldwide if the depletion of underground water supplies (to continue).
14. The Sex Discrimination Act passed recently by the US government (to eliminate) discrimination in employment.
15. The entrepreneurs (to violate) the code of ethics by promoting life dangerous products.
16. Here students (to be trained) to adopt a positive approach to the environment.

Task 6.20. Put the verbs in brackets into the correct tense (The Simple Past, the Past Continuous or the Past Perfect in Active or Passive Voice).

1. Yesterday I (to read) a newspaper feature about the leakage of oil that (to pollute) the surrounding waters.
2. The threats of global warming (to force) the country to slow down its energy consumption.
3. In the year of 1091, London Bridge (to be destroyed) during a storm.
4. The journalists and mass media (to violate) her family privacy.
5. The program (to be tailored) to suit individual requirements.
6. I had no doubt that we (to pollute) the environment beyond redemption.
7. Environmentalists (to report) that a number of beaches (to be polluted) by sewage pumped into the sea.
8. The journalist (to claim) that he had incontrovertible evidence that the government (to violate) basic human rights.
9. His supporters claim that he (to come) to power perfectly legally, but the fact is that he (to do) so by using an illegal situation.
10. The scientists warn that radiation may damage cells in a way that (to be unforeseen) previously.
11. They (to provide) a full assessment of the damage to the natural environment.
12. She (to manifest) her character in her behaviour.
13. They (to mouth) the moral principles but (to demonstrate) the opposite in their private lives.

Task 6.21. Choose the proper tense form:

1. The question of existence of ultimate values discussed for centuries.
a) is b) was c) has been
2. Greek philosophers that absolute values exist.
a) suggested b) were suggested c) had suggested

3. It was Plato's statement that ideal forms in the realm of values.
 a) exist b) are existing c) existed
4. Plato that absolute values are justice, humanism, love, wisdom and conscience which are the main laws of the science of ethics.
 a) claims b) claimed c) had claimed
5. The German philosopher Kant the world his understanding of ethics as "the categorical imperative".
 a) gives b) has given c) gave
6. The humanistic approach to science described in the works of thinkers and scientists of the past and present time.
 a) were b) is c) was
7. Speaking about professional ethics of a specialist, we underline that a scientist should bear in mind absolute ethical values while he creatively.
 a) work b) worked c) is working
8. A scientist must be responsible for his invention as it should created and applied for the good, not for the bad of mankind.
 a) will be b) have been c) be
9. Now the world already that nuclear war would mean the end of civilization, but still the threat of nuclear war is not eliminated.
 a) accepted . b) has accepted c) accepts
10. If mankind that fact much earlier, there would not have been such tragedies as Hiroshima, Nagasaki and Chornobyl.
 a) had understood b) understood c) would understand
11. However, today environmental pollution nuclear war as the major threat to our survival.
 a) replaced b) is replacing c) has replaced
12. Solving the problems of the environment the task of today's technology.
 a) is b) will be c) has been
13. For centuries, most technological inventions and discoveries were directed either towards developing new kinds of weaponry, or towards making daily life easier, but the consequences of the progress taken into consideration.
 a) is not b) were not c) are not
14. Science and technology, by themselves are not a source of ethics and values, they can only tell us what will happen if we this or that.
 a) did b) do c) has done
15. So what we need to fill technological progress with humanistic values.
 a) will be b) is c) has been
16. However, the spiritual pollution which we today, may be as dangerous as the material one and it can be seen in the lack of awareness of sense of life.
 a) face b) are facing c) will face
17. Only by promoting ethical norms based on ultimate values we can solve the problems which the world today.
 a) are threatening b) threaten c) has threatened

18. It our duty to shape a better world for all of us here on the Earth.
 a) was b) is c) is being
19. If you ask what is the good of education I that education makes good men.
 a) answer b) answered c) shall answer
20. The family, the state, the school and the church a very important role in moral training.
 a) play b) plays c) is playing
21. The Sophist philosophers ... the existence of relativistic values.
 a) suggested; b) will be suggested; c) has suggested.
22. Industrial development ... much damage to the environment.
 a) was caused; b) causes; c) cause.
23. Some products ... harmful to the health of consumers.
 a) is; b) has been; c) are.
24. The realm of industry ... greatly ... since the very beginning of the Industrial Revolution.
 a) has developed; b) is being developed; c) are developing.
25. Any kind of media ... different types of advertisement to propose goods and services to a consumer.
 a) are representing; b) will have represented; c) represents.
26. Ethics ... moral rules and principles of behaviour.
 a) refers to; b) are referring to; c) have referred to.
27. The threat of the nuclear war ... completely.
 a) are not eliminated; b) is not eliminated; c) were not eliminated.
28. Now we ... over the project aimed at solving the main environmental problems.
 a) worked; b) are working; c) is worked.
29. The destruction of nature ... the life of mankind.
 a) was destroyed; b) has been destroyed; c) destroys.
30. For centuries consequences of the technological progress for the environment ... into consideration.
 a) were not taken; b) are being taken; c) won't be taken.

Task 6.22. Match the beginning of the sentence with its logical ending:

1. Speaking about professional ethics of a specialist,
2. Having understood the main industrial problems,
3. One should keep on working
4. Our countryman H. Skovoroda spoke
5. Child labour was
6. We gathered here in order
7. To be a human being means
8. One may get rid of trash
9. Talking about bribe-taking, we consider this
10. Being aimed at the development of different kinds of weaponry,

- a) the technological discoveries are extremely harmful.
- b) to discuss the way of eliminating the mistakes having been made.
- c) we presuppose one to bear in mind the absolute values while working creatively.
- d) to be the act or practice of giving or taking money or a service to profit illegally from the so-called “transaction”.
- e) banned, insurance and pensions were introduced.
- f) we have to search for the most efficient ways of solving them.
- g) of human responsibility of a scientist.
- h) to preserve every tiny inch of the living world around us.
- i) trying to become worthy of living in this dear world.
- j) by it being dumped, burned or recycled.

Task 6.23. Put each verb in brackets into the proper form of the Infinitive, the Participle or the Gerund:

1. (to launch) a company one should think about its future working team (to work) efficiently.
2. We are looking forward to (to hear) from you about the latest achievements (to make).
3. I heard them (to discuss) the project yesterday.
4. They have done enough (to experiment) already.
5. Our society has difficulty in (to solve) the major environmental problems.
6. No (to bribe) is allowed.
7. (to consider) for centuries, the question of existence of ultimate values is also vital nowadays.
8. I object to (to treat) short-term material well-being as the goal of our existence.
9. Perfection of one's spirit is a tool for (to live) happily.
10. I want my colleagues (to help) me with the task.
11. He put off (to make) the decision till he had more information on the subject.
12. People are forced (to survive) not (to live).
13. You had better (to say) nothing.
14. I showed him which question (to answer).
15. We were forbidden (to keep on) (to do) research.
16. We should give up (to think) only of money and entertainment.
17. (to replace) by the environmental pollution as the major problem, the threat of the nuclear war is not however eliminated.
18. The mankind should be ashamed of itself for (not/to preserve) the natural world of our planet.
19. We can't help (to save) our people from (to be) evil and indifferent.

Task 6.24. Translate into English.

1. Розуміючи основні проблеми людства, вчені повинні знайти для них раціональне вирішення.
2. Любов, гуманізм, мудрість, справедливість і сумління вважають абсолютними цінностями людства.

3. Ми маємо знайти шляхи подолання таких проблем, як забруднення довкілля і втрату вічних цінностей.
4. Внутрішній моральний світ людини є однією з найважливіших індивідуальних цінностей.
5. Завдання сучасної молоді – створити кращий світ, щоб наступні покоління могли, насамперед, з гордістю продовжити їхню справу.

Task 6.25. Single out cases of using non-finite verb forms (Participles, Gerunds and Infinitives) in the following groups of sentences. Translate them into Ukrainian.

- A. Ethical standards usually are not established by government legislation, although ignoring ethical issues could mean engaging in illegal activities. Instead, *ethical standards* are a set of principles a person uses when considering the rights, privileges, and anticipated responses of all persons and groups likely to be affected by an individual's or organization's actions.
- B. Information has become a valuable asset for both individuals and organizations. As you become comfortable working with technology, you will naturally explore new methods for gathering, storing, and exchanging data. With this power, there is also potential for abuse. Used with malice or neglect, computer technology can become a tool for committing crimes or infringing upon your individual rights to privacy.
- C. Computers can store personal information about every aspect of your life. The information held about you in a computer file can be used for beneficial purposes. A nation understands the make-up of its citizens by maintaining census data on individuals. Your financial records can be exchanged electronically between banks and credit offices, perhaps to expedite processing of a loan application. The positive uses for personal data files abound. However, computer-based data files also are prime targets of abuse.
- D. Information is power. Constructive use of information opens great potential for improvements and benefits. The fact that millions of computers exist establishes that they are wanted and that they are serving the needs of people and organizations. Used properly, computers are powerful and valuable tools. Computers can be and have been misused, however. In the hands of a dishonest person with knowledge about sensitive systems, the computer can become a powerful, hard-to-detect tool for the criminal.
- E. The news media have detailed hundreds of crimes that involved computers. To make matters worse, experts fear that reported cases make up only a small portion of overall computer crime because many such crimes go undetected, and many that are detected are not reported. Banks and other financial institutions are particularly negligent in reporting computer crimes because they don't want to undermine public confidence in them.
- F. Some people wonder if being ethical these days means no more than having escaped conviction. The ethical question seems to have become, "Was it legal?" We get ourselves in trouble when a society considers ethics and legality to be the same.

Ethical behaviour requires more than following the law, but following the law is an important first step.

- G. It's easy to criticize business for its moral and ethical shortcomings, but we must be careful in our criticism to note that society as a whole isn't too socially minded either. It's always reasonable when discussing moral and ethical issues to remind ourselves that ethical behaviour begins with you and me. We can't expect "society" to become more moral and ethical unless we as individuals commit to becoming moral and ethical ourselves.

SECTION IV. DEVELOPING SPEAKING SKILLS

Task 6.26. The following are some values or principles that are discussed by those using computer systems and by the public. Working individually or in pairs read the four principles and check (✓) whether you agree or disagree. Then discuss your answers with the rest of the class:

<i>Principle</i>	<i>Agree</i>	<i>Disagree</i>
1. All knowledge and scientific information should be shared.	-----	-----
2. People's privacy should always be respected.	-----	-----
3. Private property should always be respected.	-----	-----
4. Curiosity and the search for knowledge is the most important part of being a scientist.	-----	-----

Sometimes these values/principles conflict. Then you have to decide:

- Is one value always more important than another?
- Are there certain situations when one value might be more important than another?

Task 6.27. Answer the following questions using the words and expressions from your essential vocabulary.

1. What is an advertisement? What is the main purpose of any advertisement? Are you inclined to believe advertisements or do you usually take them with a pinch of salt?

2. What do you think of professional ethics of those people who give false information to their ads?
3. Should the use of illegal drugs be banned or legalized? Support your point of view by different arguments.
4. Do you think that there exist people whose consciousness is clear? Do you know or have you ever met such people?
5. Is the human being good or cruel by nature. Why are some people cruel?
6. How can students be encouraged in their studies? Is it necessary to encourage a person?
7. What do you do for your entertainment? Do you think that entertainment people choose greatly depends on their character?
8. In what way can the greediness of a person be revealed? Can it be easily noticed?
9. Do you have any harmful habits? If so, what do you do to eliminate them? What is harmful to our health?
10. Have you ever violated any laws of society? If so, when and how? If not, do you know anyone who has violated any laws of society?
11. Do you agree with the proverb "Don't judge the book by its cover". Do you judge people by their look?
12. Do you have certain values which guide you in your life? What are they? What are the ultimate values for you?
13. Do the ultimate values change or do they have to remain the same throughout one's life?
14. Do your ultimate values remain the same or have you changed any of them?
15. Is the information we get from mass media truthful or is it tailored to the needs of influential people?
16. What are the main consequences of technological progress?
17. What is the cause for the ozone layer depletion?

Task 6.28. (a) Read the following dialogues and express your opinion on the information received.

- A: What things in the world, in your opinion, are worth admiring?
- B: I know that according to Kant, there are two things: the starry sky and the inner moral world of a man.
- A: I have heard that there are three things that a man can watch forever: burning fire, running water, and other people working.
- B: Oh, your generation can find a joke in everything. You don't think about absolute values.
- A: Don't be so serious. We have to think about our short-term well-being.
- B: But everyone is responsible for the evil of mankind. We must think about the next generation. If everyone is so indifferent, our civilization will come to a bad end.

Sources of Greenhouse Effect

- A: Hello. Why are you so puzzled?
- B: Hi. You know, I have noticed that this winter began much later than usually. I think it was caused by the greenhouse effect which keeps our Earth too warm nowadays.
- A: Oh, I know something about the greenhouse effect. It is produced by exhaust gases of fuel burning.
- B: You're almost right. Actually, there exists a natural greenhouse effect created by such gases as carbon dioxide, methane and nitrous oxide. It contains water vapour too.
- A: Some names of those gases seem familiar to me. I know that carbon dioxide emanates from burning fossil fuels.
- B: It's true. And do you know that since 1750 carbon dioxide in the air has risen by more than 30 per cent, due to the human activities?
- A: But that's great! The more gases we get the more heat we receive. In a few years we won't need to go to Egypt for some sun!
- B: Aha, and for some sea also! It will simply come to us. Don't you understand that we are violating the natural balance!!! We heat the atmosphere, the atmosphere heats the pole caps, the pole caps melt and flood almost everything, to say nothing about the total climate changes during the warming!
- A: It's really awful. But what can we do about it? Everybody needs cars, coal for heating and elimination of garbage.
- B: Yes, but maybe it is not too late to change our lifestyle. We can use cars on solar power, for example.
- A: And I've also heard about useful garbage recycling. Bottles and some plastic car parts are made out of it.
- B: It is a great source of raw material as well. Instead of oil, coal and natural gas people have found alternative sources of power such as wind power and the power of waves.
- A: It is so nice, but not that simple as it seems. There are lots of economic and political questions about this problem.
- B: They'd better solve it quickly before it's too late.

Global Warming

- A: I've been thinking a lot about ecological situation in the world recently. The problem of adding nitrous oxide to the atmosphere is disturbing me.
- B: Really? You know, yesterday I watched a TV programme on Discovery Channel dedicated to this issue. I was shocked to hear that every year we add seven up to thirteen million tons of nitrous oxide to the atmosphere.
- A: Quite so. And it is the automobile exhausts as well as disposing of human and animal wastes that are responsible for that.
- B: Yes, I quite agree with you because this is an urgent problem of humanity, but I think the global warming is also a big problem.

- A: Some of the ways that the Earth may respond to the global warming must be rapid. By continuing to add the greenhouse gases to the air we may be surprised by some nasty changes.
- B: As the Arctic gets warmer, huge amounts of methane, now frozen under the ocean and land could escape into the air. Because methane is a greenhouse gas that traps heat in the atmosphere, those added emissions could cause the Earth to warm even faster than it is now expected.
- A: Yes, and scientists are working on this issue. To estimate the impact of global warming on future harvests scientists build computer simulations or models of climate, crops and market conditions. The models are first tested in present day conditions, and then used to predict possible future changes. And have you heard how the global warming may affect people's health?
- B: Well, it may affect in a variety of ways. People may suffer from heart strokes and heart attacks. Also such diseases as malaria and yellow fever may become widespread in many countries that are situated in warm climatic zones.
- A: In my opinion, we need a lot of such useful programmes telling us more and more about pollution on the Earth.
- B: And also each of us needs to take practical measures to prevent the pollution of the Earth and not add to the global warming.

Task (b) Work in pairs. Read the interview, clarify the meaning of some new words and discuss the main ideas and problems arisen with your group-mate and then with the class. Try to use your own experience and knowledge.

Ethics in Science

1.

- T. Your opinion of the personality of a scientist, please.
- S. Well, it should be someone with a perfectly clear record, who's thinking creatively.
- T. So, you emphasize two things: honesty and creativity, don't you?
- S. Quite so. Nowadays, many people don't seem to understand that honesty is the best policy in science.
- T. As far as I see, you focus on honesty, why?
- S. Because lots of facts clearly show the contrary behaviour of some scientists. You know, there have been dozens of books published in the last ten years or so telling stories of successful scientific discoveries as episodes of cutthroat competition and cutting corners by scientists anxious to get there first and win the biggest prizes and grants.
- T. They seem to believe that the end justifies the means.
- S. Oh yes. I think this rush to get things done even if it means doing risky things, is a real threat to science.
- 2.
- T. And what about criticism and praise which always accompany any research work?

- S. I believe, peer review, mutual criticism should be objective and impartial. You need to judge work by how good the work is, not by who did it or where he/she is from.

3

- T. Now, let us talk about conflict of interests.

- S. To my mind, it's a very serious and complicated problem. It's difficult to award grades without being influenced by how you like or dislike student's manners.

- T. And if the student is also a friend, child, or a spouse?

- S. You should avoid having such people in your class. First, it protects you from an intolerable conflict of interests, between wanting to be fair and desire to please someone you care about. Second, it also protects the rest of the class from being suspicious of the teacher and jealous of his protege.

4.

- T. Well, you've given an example of conflict of interests as a problem for individuals. But is it only a personal matter?

- S. No, it is not. Institutions too can and do suffer from conflict of interests. Universities, for example, need money for the desirable and valuable things they do.

- T. Could you give some examples, please?

- S. Sure. In September 1989, the National Institute of Health (NIH) (USA) proposed that people funded by NIH (or their assistants, consultants, spouses, or children) shouldn't own stock in the companies that would be affected by the outcome of the research; and those results could not be shared with private firms before they had been made public. They also proposed that people applying for grant should disclose all sources of support, including honoraria and consulting fees.

- T. Doesn't all that sound reasonable?

- S. Yes, but nevertheless NIH was flooded by protests. The NIH guidelines would have prohibited investigators from taking money from companies whose products they were evaluating in a government-funded project.

- T. Seems a sensible enough safeguard, doesn't it?

- S. "Blanket prohibitions don't work", once said the Vice-President for Research at one of the leading universities of the USA.

- T. And what works? What is common practice?

- S. Accepting gifts from parents, graduates, and other benefactors has been standard practice.

- T. And does it usually cause trouble?

- S. Unless, of course, a wealthy donor has a stupid nephew whom he wants enrolled and given a degree.

- T. And could you dwell on problems concerning scientific institutions, please?

- S. Well, in the USA institutes hire lobbyists to persuade the government to designate some funds for a new building or program. Universities hire for 6-figure fees – people who try to persuade members of Congress to put into some bill, say \$60 million dollars for a supercomputing center at Cornell University. That's an actual example from about ten years ago. This new method of using political clout rather

than intellectual merit to make decisions, pork-barreling in other words, is an almost hallowed American tradition but it has only recently been taken up by universities. The American Association of Universities – the most prestigious organization of research universities in the United States – admitted that this pork-barreling is a bad thing, and wished that it wouldn't happen; but it refused to criticize those of its members who were doing it, on the grounds that the need for resources is so great.

- T. In other words, was the Association saying that the end justifies the means?
- S. I think, the end can never justify the means. Use force instead of persuasion, and you'll have a society that's controlled by force; use pork-barreling to get what you want, and you'll have a society that works through bribery and not on the basis of merit.

(Adapted from the Internet)

Answer the following questions:

1. Should you choose a project which is interesting for scientific reasons or because there's money to be made out of it?
2. What is your opinion about contact between academia and industry?
3. Are you always preoccupied with rapidity?
4. Is it better to be fast than to be sound?
5. Is it better to get false results quickly than valid results slowly?
6. If conflict of interests is permitted, why assume that only one person would suffer from it rather than everyone?
7. Can any person be trusted as much under a conflict of interests as when there is no such conflict?
8. What is your personal experience of handling a conflict of interests?

SECTION V. READING AND WRITING

Task 6.29. Read the main body of Prof. Biletsky's paper and give an oral summary of the text:

Ladies and gentlemen! The subject of my presentation is "Humanism, Ethics and Technological Progress". ...

...As you know the question of existence of ultimate values has been discussed for centuries. Greek absolutists Socrates and Plato were disgusted with the relativistic values advocated by the Sophist philosophers of their days. They clearly suggested: (1) absolute values exist, and (2) some values are more important than others. It was Plato's statement that ideal forms exist in the realm of values just as ideal forms exist in the realm of geometry and logic. He claimed that among those absolute values are

justice, humanism, love, wisdom and conscience which are the main laws of the science of ethics. The German philosopher E. Kant gave the world his understanding of ethics as "the categorical imperative". He said, "There are two things in the world worth admiring: the sight of the starry sky and the inner moral world of a man". The humanistic approach to science is also wonderfully described in the works of other thinkers and scientists of the past and present time: Confucius, Ecclesiastes and Thomas of Aquinas, A.Schweitzer and T.Mann, our countrymen H.Skovoroda, I.Puluy and V.Vernadsky. They all spoke of human responsibility of a scientist.

Speaking about professional ethics of a specialist, we underline that a scientist, first and foremost should bear in mind absolute ethical values while he is working creatively. He must be responsible for his invention as it should be created and applied for the good, not for the bad of mankind. Unfortunately, there are cases when results of scientific investigation are tailored to the needs of the company which sponsors this investigation. So the publication of the results in mass media is an advertisement for the products manufactured by this company, even if these products are harmful to the health of consumers. Other ethical problems that should be considered by scientists are plagiarism and violation of the rights to intellectual property.

... Now the world has already accepted that nuclear war would mean the end of civilization, but still the threat of nuclear war is not yet completely eliminated. If mankind had understood that fact much earlier, there would not have been such tragedies as in Hiroshima, Nagasaki, Chornobyl, Bikini and Mururoa atolls. However, today environmental pollution has replaced nuclear war as the major threat to our survival.

Solving the problems of the environment – such as the depletion of the ozone layer, water pollution and global warming – is the task of today's technology. Before the industrial revolution started in Europe, workers had been cruelly exploited. Then during the second half of the 19th century and in the 20th century, a "humanization" of industry began. Child labour was banned, insurance and pensions were introduced. New inventions eased the labour. Today we need a second humanization – in the realm of environment.

For centuries most technological inventions and discoveries were directed either towards developing new kinds of weaponry, or towards making daily life easier, but consequences of the technological progress for the environment were not taken into consideration. Now we must find ways to maintain living standards in industrially developed countries and to improve them in developing ones, with as little damage to the environment as possible. Some people say that because science gave birth to industry and industry has destroyed the environment, science shouldn't be encouraged. This is completely misguiding. It is true that the mismatch which emerged between the technological progress and humanism caused such global problems as survival of man in the nuclear century, labour dehumanization leading to unemployment, ecological problems. Science and technology, by themselves, are not a source of ethics and values. They can tell us what will happen if we do this or that – for instance, how many people might be killed by a nuclear bomb. But the decision on whether to develop the bomb

cannot be a scientific decision. This can only be judged by ethics. So what we need is to fill scientific technological progress with humanistic ethical values.

However, the spiritual pollution which we face today, may be as dangerous as the material one. It manifests itself in what I would call the “greediness of society” – where people think only of money, wealth, entertainment and their own personal short-term well-being. And it can be seen in the lack of awareness of sense and purpose of life. Thus, we should promote ethical norms based on ultimate values such as justice, conscience, love, wisdom and freedom. Only in this way we can solve the problems which threaten the world today – the destruction of environment, alcoholism, drug-abuse, AIDS, totalitarianism and all sorts of extremism. It is our duty to shape a better world for all of us here on the Earth.

Task 6.30. Read and translate the text using dictionary if necessary, and answer the questions given below.

TECHNOLOGICAL CULTURE AND ITS PROBLEMS

That humans have been designated *Homo faber* (man the maker, tool user) rather than *Homo sapiens* (man the wise, thinker) indicates the centrality of technology in the life of even those primitive communities which we classify on the basis of their stage of technological development – stone age, bronze age, iron age. But as the Prometheus myth reminds us, fire and the metal-based technology it confers, although essential to the development of human civilizations, was surrounded by ambivalent attitudes: it promises to confer god-like powers of control over nature, but it is not clear that mere mortals are sufficiently god-like to be able to wield this (stolen) power wisely. It is a power which can be used to destroy as well as to create: medicines developed to restore health become poisons when used negligently or maliciously; mass media invented to enlighten are used for propaganda; and computers which extend our knowledge exponentially can invade our privacy in ways unthinkable only a short time ago. Even the most benevolent technology carries with it the potential for harm; implicit in every ploughshare there is a sword.

Since World War II the pace of technological development has increased dramatically, trailing in its wake problems of which our grandparents did not even dream. Waste disposal has always presented problems for settled human communities, but none remotely comparable to those presented by nuclear waste disposal, which, if not carried out properly, could contaminate portions of the earth virtually forever. But what are the proper methods of disposal? Here a public consensus is strikingly lacking. Genetic engineering opens up the possibility of manipulating hereditary material in such a way that species, including our own, can be significantly altered. Do we know enough about the development of organisms or about ecological balances to pursue this possibility prudently? Even granting that we have sufficient knowledge, should experiments of this kind be allowed, and on what species? Should experimentation on human genetic

material be allowed? Computers have altered so extensively the way information is collected, interpreted and disseminated that it is appropriate to speak of an information revolution. Much of this development was prompted and funded by military interests. That generals have the latest computer-generated information seems desirable; that 'decisions' to launch nuclear missiles may be made by computers rather than people, because people cannot respond quickly enough to (possible) enemy attacks, engenders terror and a feeling of helplessness.

Developments in First World countries generating dilemmas such as these have accentuated the divide between developed and developing nations. Can this gap be narrowed by a transfer of technology from developed to developing nations, and if so should developed nations give aid in this form? Not to do so may retard development to such an extent that the lives of hundreds of millions of people will remain materially and spiritually impoverished. Yet technology which may make perfect sense in a developed nation can be inappropriate when transferred to a developing nation. The use of chemical pesticides can bring benefits, but is also hazardous. Peasant farmers, unused to handling such substances, may cause serious damage to themselves and the environment. The emergence of resistant pests means that increased crop yields are frequently sustainable only by increased dosage or use of new types of pesticide, which have to be purchased using scarce foreign exchange. In transferring its technology a donor nation inevitably transfers its own ways of thinking and doing, its own institutions and values. These interact profoundly but unpredictably with the ways of life of the recipient nation.

The course of technological development in First World countries reflects their dominant values and institutions, their ways of thinking and doing. The results of science and technology are familiar enough, and can mesmerize us. But they are the results and embodiments of human problem solving practices, results which in turn shape the lives of people employing them. (Pesticides are a response to crop destruction. To be used effectively and safely, however, farmers must take all sorts of precautions, study crop development and carefully determine time and rate of applications. To do so with modern pesticides they must be numerate and literate.) As practices, science and technology involve presuppositions, the acquisition of skills, norms of behaviour and value commitments.

*(Adapted from Tiles, Mary and Oberdiek,
Hans 'Living in a Technological Culture:
Human Tools and Human Values',
London and New York, 1995, pp. 1-3)*

Essential vocabulary

1. to designate – to specify, to describe as
2. community – body of people living in the same locality
3. to confer – to grant, to bestow
4. to wield – to control, to sway
5. negligently – carelessly

6. maliciously – with wrongful intention
7. to enlighten – to instruct, to inform
8. benevolent – desirous of doing good, charitable
9. implicit – implied through not plainly expressed
10. waste disposal – getting rid of useless by-products of manufacture
11. to contaminate – to pollute, to infect
12. consensus – agreement
13. lack – deficiency, want, need
14. hereditary – transmitted from one generation to another
15. species – a group into which animals, plants, etc. that are able to breed with each other are divided
16. to alter – to change in character
17. to pursue – to proceed, to continue, to go in pursuit
18. to disseminate – to spread, to scatter
19. to engender – to give birth, cause
20. to accentuate – to emphasize
21. to impoverish – to make poor
22. inappropriate – not suitable
23. to sustain – to uphold, to support, to keep from falling
24. to mesmerize – to hypnotize
25. presupposition – thing assumed beforehand as basis of argument; assumption
26. acquisition – act of acquiring
27. commitment – adherence; devotion; fidelity attachment

Check your understanding answering the questions (use a dictionary if needed):

1. What indicates the centrality of technology in the life of mankind?
2. What are the stages of technological development of the primitive communities?
3. What does the Prometheus myth remind us?
4. What can be used to destroy as well as to create? Give some examples.
5. When has the pace of technological development increased dramatically?
6. Problems of which waste disposal are most serious?
7. What does genetic engineering open up?
8. In your opinion, should experiments on human genetic material be allowed?
9. Is it appropriate to speak of informational revolution?
10. What are the ways of assisting developing countries?
11. What problems is this assistance connected with?
12. What do science and technology involve as practices?

Task 6.31. You are given two texts, A and B. They deal with the same subject from different points of view. Read and study the two texts, noting the differences in argument and studying the vocabulary.

THE MORAL RESPONSIBILITY OF THE SCIENTIST

Text A

To argue that scientists have no moral responsibility for the use or misuse of their discoveries oversimplifies the issue. It ignores the fact that top-level research scientists are not ordinary people. Since their duty is to do no basic harm to the society in which they live, which has trained them and by which their research is funded, they should suppress those scientific discoveries which might be misused, and which ordinary people do not know about.

There are a number of reasons for this. In the first place scientists are, as individuals or as members of a research team, in a position to know what is going on at a given moment in their field, nationally and internationally. They are in a position to know what has been discovered, and in which field crucial discoveries are likely to be made.

Therefore, acting individually, or together with their fellow-workers, scientists possess invaluable information which should be made known to their fellow citizens if it has, or may have, a direct bearing on their well-being.

As privileged citizens, and members of powerful international elite, scientists are also in a position to fight for the suppression of potentially harmful discoveries. To suppress dangerous inventions does not only mean to conceal them. On the contrary, by revealing, or bringing them out into the open, which they have the knowledge and the professional authority to do, scientists can enable informed decisions to be made by their fellow citizens as a body. This is surely preferable to such decisions remaining secret, to being the target of scientific espionage, or to being in the hands of irresponsible political or military rulers in pursuit of dangerous policies.

Furthermore, only the scientists – the experts in their special fields of research – have the knowledge, skill, and insight on which judgements relating to the latent use, or the consequences of use, of new products and processes can be adequately made. A disastrous moral judgement is more likely to be made by uninformed politicians, than by well-informed experts, able to consult with colleagues in other fields at the highest level.

It is not that one is entitled to expect scientists to have a higher brand of morality than their fellow-citizens. But in so far as knowledge constitutes power, scientists are powerful. Therefore their moral decisions, and thereby their duty, must be more carefully considered in all their implications.

As privileged members of society, scientists have an underlying obligation to reveal information about potentially harmful discoveries, to enable their fellow-citizens to anticipate danger and to decide what to do about them. It is easier, surely, to convene an executive committee to decide on the manufacture of a new and potentially lethal gas, than to replace lost lives. After all, dead citizens cannot vote.

In short, scientists do have a direct and special duty to their fellow-men. They cannot avoid this responsibility by maintaining that someone else should do it. If, to take an example, they are powerful enough to convince a government to ban alcohol or drugs, they are powerful enough to influence the proliferation of nuclear weapons.

A scientist is not isolated from society. He or she is also a moral being with a social conscience. Knowing more than ordinary people, scientists should be the first people to expose the misuse of scientific discoveries endangering the lives and surroundings of their fellow-citizens.

(Adapted from the Internet)

Text B

When we talk of the moral responsibilities of scientists we mean nothing more than that they have a duty to do no fundamental harm to the society in which they live. Since they share this duty with everyone else – insurance men, teachers, civil servants, manual labourers, farmers – one assumes that they are singled out for special mention first because they are a new phenomenon (97 per cent of all the full-time scientists who ever lived are still alive) and secondly because of their disproportionate power to help or harm society. Society's fear of the scientist is not irrational; for society is conservative, backward-looking and intent for preserving the *status quo*, while the scientist is radical, forward-looking, and by his or her discoveries likely to change the material environment of society. Since scientists threaten the established order in this way, they are, by our previous definition, immoral. The usual charge levelled at scientists is that they ought to, and do not, suppress those discoveries of which a harmful use might be made.

This naive accusation, however, reveals a basic ignorance about how scientists work. In the first place discoveries are not usually the work of one person, but of a team. Splitting the atom, the example to which any discussion of science and morality inevitably leads, is a case in point.

Another is penicillin, which we owe partly to Fleming and partly to those who took up his work and made production a practical possibility. Secondly, scientific advances are not made in a vacuum. One advance follows the other, and each leap forward opens up new fields for further research. Science is a chain reaction, and it might be disastrous to suppress a discovery, however trivial, which might one day be a vital missing link. Thirdly, discoveries have an uncanny habit of being made almost simultaneously by scientists working independently of each other in different parts of the world, so that one is tempted to believe that each advance becomes due at a particular moment and if not made by one person will be made by another. It is futile to ask a scientist to conceal his discoveries, because they are not his alone; he has worked in concert with others and even if by superhuman effort and diplomacy a whole team of scientists could be persuaded to keep them secret, they would soon be discovered and taken up elsewhere.

In any case who would be bold enough to set himself up as an authority capable of deciding what is harmful and what is helpful to society? Arsenic can be used to poison rats or misused to poison people; atomic power to warm the world or to blow it up. The scientists who made possible the heating and lighting of houses by gas can hardly be blamed for failing to foresee the use Hitler would make of their discovery.

The truth is that it is the ordinary man and woman who use or misuse the discoveries of science. As members of society, scientists have a responsibility to see that they are put to proper use (a special responsibility because they know more about them

than other people), but as scientists, their duty is to discover as much as they can about people and the universe. The use that may be made of the discoveries of scientists is not a responsibility that can be shuffled on to them. It rests squarely on the shoulders of society.

(Adapted from the Internet)

Task 6.32. Read the two texts. Write an outline of the first text and answer the questions to the second one.

RESPONDING TO VIOLATIONS OF ETHICAL STANDARDS

One of the most difficult situations that a researcher can encounter is to see or suspect that a colleague has violated the ethical standards of the research community. It is easy to find excuses to do nothing, but someone who has witnessed misconduct has an unmistakable obligation to act. At the most immediate level, misconduct can seriously obstruct or damage one's own research or the research of colleagues. More broadly, even a single case of misconduct can malign scientists and their institutions, result in the imposition of counterproductive regulations, and shake public confidence in the integrity of science.

To be sure, raising a concern about unethical conduct is rarely an easy thing to do. In some cases, anonymity is possible – but not always. Reprisals by the accused person and by skeptical colleagues have occurred in the past and have had serious consequences. Any allegation of misconduct is a very important charge that needs to be taken seriously. If mishandled, an allegation can gravely damage the person charged, the one who makes the charge, the institutions involved, and science in general.

Someone who is confronting a problem involving research ethics usually has more options than are immediately apparent. In most cases the best thing to do is to discuss the situation with a trusted friend or advisor. In universities, faculty advisors, department chairs, and other senior faculty can be invaluable sources of advice in deciding whether to go forward with a complaint.

An important consideration is deciding when to put a complaint in writing. Once in writing, universities are obligated to deal with a complaint in a more formal manner than if it is made verbally. Putting a complaint in writing can have serious consequences for the career of a scientist and should be undertaken only after thorough consideration.

The National Science Foundation and Public Health Service of the USA require all research institutions that receive public funds to have procedures in place to deal with allegations of unethical practice. These procedures take into account fairness for the accused, protection for the accuser, coordination with funding agencies, and requirements for confidentiality and disclosure.

In addition, many universities and other research institutions have designated an ombudsman, ethics officer, or other official who is available to discuss situations involving research ethics. Such discussions are carried out in strictest confidence whenever possible. Some institutions provide for multiple entry points, so that complainants can go to a person with whom they feel comfortable.

Government agencies, including the National Science Foundation and Public Health Service, enforce laws and regulations that deal with misconduct in science. At the Public Health Service in Washington, D.C., complaints can be referred to the

appropriate office through the Office of Research Integrity. At the National Science Foundation in Arlington, Virginia, complaints can be directed to the Office of the Inspector General. Within universities, research grant officials can provide guidance on whether federal rules may be involved in filing a complaint.

Many institutions have prepared written materials that offer guidance in situations involving professional ethics. Volume II of Responsible Science: Ensuring the Integrity of the Research Process (National Academy Press, Washington, D.C., 1993) reprints a number of these documents. Sigma Xi, a national society of research scientists headquartered in Research Triangle Park, North Carolina, the American Association for the Advancement of Science in Washington, D.C., and other scientific and engineering professional organizations also are prepared to advise scientists who encounter cases of possible misconduct.

The research system exerts many pressures on beginning and experienced researchers alike. Principal investigators need to raise funds and attract students. Faculty members must balance the time spent on research with the time spent teaching undergraduates. Industrial sponsorship of research introduces the possibility of conflicts of interest.

All parts of the research system have a responsibility to recognize and respond to these pressures. Institutions must review their own policies, foster awareness of research ethics, and ensure that researchers are aware of the policies that are in place. And researchers should constantly be aware of the extent to which ethically based decisions will influence their success as scientists.

(Adapted from the Internet)

A CAREER IN THE BALANCE

Francine was just months away from finishing her Ph.D. dissertation when she realized that something was seriously amiss with the work of a fellow graduate student, Sylvia. Francine was convinced that Sylvia was not actually making the measurements she claimed to be making. They shared the same lab, but Sylvia rarely seemed to be there. Sometimes Francine saw research materials thrown away unopened. The results Sylvia was turning in to their common thesis advisor seemed too clean to be real.

Francine knew that she would soon need to ask her thesis advisor for a letter of recommendation for faculty and postdoc positions. If she raised the issue with her advisor now, she was sure that it would affect the letter of recommendation. Sylvia was a favourite of her advisor, who had often helped Sylvia before when her project ran into problems. Yet Francine also knew that if she waited to raise the issue the question would inevitably arise as to when she first suspected problems. Both Francine and her thesis advisor were using Sylvia's results in their own research. If Sylvia's results were inaccurate, they both needed to know as soon as possible.

1. Should Francine first try to talk with Sylvia, with her thesis advisor or with someone else?
2. Does she know enough to be able to raise concerns?

3. Where else can Francine go for information that could help her decide what to do?

Task 6.33. Write an essay of approximately 300 words on the environmental problems in your region, city, town or village.

SECTION VI. EXTENDED READING

Task 6.34. Read the texts and discuss them with your fellow students:

Text 1. KILLING FIELDS

Power lines, computers, radar, microwave ovens and electric blankets are sources of non-ionising electromagnetic radiation and threaten the health of the users.

It is a bit more than 100 years since electricity generation started, about 80 years since the beginning of public radio transmissions and 60 years since radar was first used. Since the 1950s we began to surround ourselves with significant amounts of electromagnetic energy.

When radar was first introduced in World War II, it was such an important factor in the Allied victory that few raised questions of its biological safety: safety standards were set high enough to allow the military virtually unrestricted use of microwave and high-frequency radiation. American scientific reports from that time, suggesting that microwave radiation might cause leukaemia, cataracts, brain tumours and heart disease, were ignored.

When maximum exposure levels were set in the 1950s, they were mainly based on how much external power could be dissipated on the surface of the human body without causing a significant rise in body temperature. The validity of these and subsequent safety standards across the electromagnetic spectrum is now being challenged, both within the scientific community and, increasingly, in the courts. This has been brought about by the considerable number of research reports linking low-level alternating electric and magnetic fields with a variety of serious health effects. Particularly worrying are the reports about the effects of 50 Hz and 60 Hz power-line fields, low-frequency pulsed radar systems and high-power ELF (extremely low frequency) communication systems. Here is a selection of some of the report conclusions:

The risk of dying from acute leukaemia is increased by 2.6 if you work in an electrical occupation, especially if you are a telecommunication engineer or radio amateur.

Service personnel exposed to non-ionising radiation when compared with their unexposed colleagues were almost seven times as likely to develop cancer of the blood-forming organs and lymphatic tissue.

10 to 15 per cent of all childhood cancer cases might be attributable to power-frequency fields, found in their homes.

Clinical depression and suicides were closely linked with living near power lines. Nevertheless, some countries still allow to build houses directly under high-voltage distribution cables.

(Adapted from "Electronics World + Wireless World")

Text 2. SPACE LITTER

When the space shuttle Challenger returned to Earth with a cracked windshield in June 1983, engineers assumed the culprit (винуватець) was a micro-meteorite – a stray piece of cosmic dust that could have hit the windshield at 44,000 miles (71,600 kilometres) per hour. But after examining the fracture (тріщина) pattern and trace elements in the crack, scientists concluded that whatever Challenger ran into was man-made.

The case of Challenger's windshield illustrates a serious concern among people who put spacecraft into orbit. So much debris (уламки) litters the space lanes that it poses a major collision hazard. Experts suspect that space collisions have destroyed several satellites, all of which had been in good condition. If the debris keeps accumulating, the chances of collision are greater. Thousands of objects the size of a baseball or larger, each circling Earth at 17,500 miles per hour, are now being tracked in space. Some of them are operating satellites but others are old rockets, fuel tanks or remnants of previous explosions and collisions.

A more serious threat are objects the size of golf balls. Even the third category of space garbage – tiny orbiting flakes, estimated to number in the billions – is potentially hazardous. They are the prime suspect in the case of the shuttle windshield, which was the first proof engineers had that space debris was a growing problem. A more convincing case came when another astronaut crew returned to Earth with parts of the Solar Maximum satellite they repaired in the orbit. There were 160 small craters in the layered plastic insulation. Most of the holes found in the plastic had been punctured by man-made objects.

Much of the space debris came from satellites' and second-stage engines' explosions and catastrophic collisions that have occurred in Earth's orbit. Besides, 1.2 billion metal needles were put into orbit by the US Air Force in 1962 and 1963 to see if radar signals could be bounced off them. The collisions and explosions have unfortunately taken place at fairly high altitudes, which means that most of the leftover debris will stay in orbit instead of coming down and burning up in Earth's atmosphere.

(Adapted from *The Herald Tribune*)

Text 3. DESTRUCTIVE FORCE OF EARLY CIVILIZATIONS

The Anastazi Indians and other early civilizations may have killed themselves off by plundering local plants and animals.

New archaeological findings suggest that, far from living in perfect harmony with nature, prehistoric civilizations dealt major and sometimes fatal blows to their natural surroundings. Many investigators now question the notion that environmental problems began only with the Industrial Revolution in the 19th century.

To be human means you have the ability to modify your environment in a way other animals can't. A Stone Age society can't go in with bulldozers and chain saws (ланцюгова пила). Nevertheless, archaeological excavations (розкопки) prove that long before the appearance of industrial civilization, prehistoric societies were levelling forests, exterminating entire plant and animal species and exhausting farmland. The destruction they wrought sometimes destroyed them in turn. The mysterious disappearance of the Anastazi Indians may be an example. On the territory of the present-day New Mexico and Arizona, the Anastazi built an elaborate complex of roads, irrigation channels and, most notably, giant pueblos built of stone and masonry (кам'яна кладка), some five stories high with 800 rooms or more. All were abruptly abandoned around AD 1200. Until now, the majority of archaeologists have believed that the reason was a prolonged drought. But by using an electron microscope and carbon-14 dating, scientists analyzed the logs of pueblos and came to the conclusion that the Anastazi had systematically deforested the canyon until they had to travel 50 miles or more to gather wood for fuel and logs for building their dwellings.

Archaeologists have a tendency to interpret any change in the archaeological record as a climatic change. This so-called environmental-determinism theory, which holds that climate dictates culture, is being eroded by the new findings.

The people of Easter Island, known for their enormous stone statues, may have been another culture that reaped its own bitter harvest: the island was heavily wooded until Polynesians settled there around AD 400. By the 18th century, when Europeans first landed, it was treeless. Deforestation would have hastened soil erosion, lowering crop yields. It would have eliminated the source of the dugout canoes vital for fishing. Although European settlers hunted a number of birds to extinction, they were merely finishing work begun by the Polynesians centuries before. 80 to 90 per cent of the species of birds in the South Pacific had been already gone by the time Captain Cook came in the 18th century. Species that weren't hunted were wiped out when the Polynesians cleared the low-land forests for agriculture and destroyed their habitats. Some of these birds survive on a few remote islands, but others live on only in the legends of islanders. They have names for birds they've never seen. And archaeologists can find birds that match their descriptions exactly in the fossil record (зкам'янілі пам'ятки минулого).

(Adapted from The US News & World Report)

Text 4. RECYCLING

There are several basic ways to get rid of trash. It can be dumped, burned or recycled (reused in a different form). Today as in the past most countries dump or burn most of their trash. But people's attitudes about trash began to change after World War II. Reconstruction and increase in population meant accumulation of more garbage. As time went on, people became aware that landfills (сміттєзвалища) and incinerators (сміттєспалювальна піч) posed health hazards. By the 1970s, local governments faced a big problem. They had more garbage, fewer places to put it, and tougher laws telling them how to get rid of it. All of those things made garbage disposal more expensive and encouraged recycling. But that is not the only reason why recycling is so popular. It also makes good business sense: (1) It cuts down on the use of valuable new raw materials; (2) It saves energy; (3) It creates less pollution. To use valuable resources just once and then try to dispose of them doesn't make sense from an efficiency point of view or a pollution point of view.

Even so, recycling has its problems. They result from the fact that recycled trash is a product. Like all products, it is governed by the law of supply and demand. Take paper, for instance. By recycling paper, the amount of trash is significantly cut down. In the mid-1980s, many cities and communities recognized that fact and began massive paper-collection efforts. But they arose a problem. No one wanted to buy all that paper. Reprocessing factories could not handle all the paper that people were collecting. The result: a glut (перенасичення) in the market for recycled paper. So, many paper companies were reluctant to invest millions in building new paper-recycling plants. They wanted to make sure that someone would buy the paper once they recycled it.

The prospect for paper recycling now looks good. But some other popular materials – such as plastics – have their problems too. Different types of plastics cannot be mixed together. Soda bottles, for example, have a different chemical composition from milk jugs. It means that plastics must be sorted by recycling companies at great cost.

Businesses are finding clever ways to handle hard-to-recycle products. But some recycling problems may never be solved. Recycling produces less pollution than using new raw materials, but recycling does cause pollution too. That is why experts say that recycling will never be a cure-all for getting rid of garbage.

The best way to cut down on garbage is for people to *use less*. Then there is less to throw away. Another simple thing for people to do is to *buy recycled products*. This creates a demand for recycled goods that businesses will answer. It is also important to *find creative ways to recycle*. Rubber and plastic are difficult to recycle because of their chemical properties. But even here, creative recyclers are making progress: discarded plastic is used to make aeroplane seats, furniture, sweaters and other clothing. Old rubber tires are often used on playgrounds and for reinforcement of road pavement. Rubber is also recycled into products such as soles of running shoes. And the number of recycled products is growing all the time.

Text 5. AT WAR WITH THE INFO-TERRORISTS

Over the past 30 years, the US has witnessed and contributed greatly to a technology revolution. As a result, the US public (government, business, military) and private (citizens) sectors have become increasingly dependent on the uninterrupted and trusted flow of digital information. Day-to-day operations of banking, energy distribution, air traffic control, emergency medical services, transportation, and many other industries all depend on reliable telecommunications and increasingly complex network of computers, databases, and computer-driven control systems. The Internet has created a global information network that provides opportunities for digital commerce. The connectivity creates a world of commerce without borders. At the same time, this connectivity and dependency make separate sectors vulnerable to information warfare attacks. These attacks, in whatever form, could not only disrupt our daily lives, but also seriously jeopardize our national security. The private sector is being "hit" every day by hackers who spread computer viruses, send abusive messages or even threats to other computer users. People are aware of incidents where computers were used to divert funds by false bank wires, and credit card fraud. These incidents appear to be isolated and the goal limited to theft, that is high-technology bank robbery. However, the number and size of these intrusions may grow to threaten our economic well-being. Besides, hackers and terrorists organizations might use information warfare techniques as part of coordinated attack designed to seriously disrupt infrastructures such as electric power distribution, air-traffic control, or financial sectors, international commerce, and deployed military forces in time of peace or war. Anybody can acquire the hardware and software to attack information-based infrastructures. The methods used could range from such traditional terrorist methods as a vehicle-delivered bomb to electronic attack. The latter methods could rely on paid hackers. The ability to launch an attack is likely to be within the capabilities of a number of terrorist groups, which use the Internet and other modern means for their own communication.

(Adapted from *The Guardian*)

Text 6. TOXIC SHOCKER

Spitzbergen has a dirty secret. The last stop before the North Pole, and Europe's most northerly outpost, has become the continent's long-range cesspool, courtesy of a quirk in the planet's atmospheric circulation system. Some scientists fear that, eventually, the majority of some of the most lethal man-made chemicals – most of which are now banned in Europe – could end up in places like Spitzbergen, 1,000 kilometres inside the Arctic Circle. Fish in the lakes of Spitzbergen contain six times more mercury than fish in the Scottish highlands – and more than 20 times more than those in Spain. The further north one goes, the more contaminated the fish is.

There is nothing natural about this contamination. The metals come north from the mainland of Europe, and perhaps beyond. And it is not just metals. Poisonous

pesticides and industrial chemicals, many banned in Europe for 20 years or more, are turning up in increasing concentrations in Spitzbergen. Every winter, pollution from European cities and metal smelters forms a smog that spreads north to the Arctic. Some pollutants are deposited on the snow and ice. Each spring, as the ice melts, these poisons flush into the sea, entering the food chain. They are eaten by fish and by birds, seals and polar bears that eat the fish.

There is a global process that is systematically transferring these chemicals from warmer to colder areas. That's why, for instance, trout in remote lakes in the Yukon contained levels of the pesticide toxaphene that were 10 times higher than Canadian food safety health limits. High levels of DDT, a crop pesticide, dioxins, PCBs (polychlorinated biphenyls, man-made chemicals once widely used in the electronics industry) and mercury are also found in the fish. Toxaphene has been banned in Canada for over a decade, but it is widely used in tropical Asia and Latin America. It should be noted that most chemicals evaporate readily – especially in hot climates – and can remain in the air, perhaps for several years, till that air gets cold enough for them to condense out. It is as if the entire planet's atmosphere is operating a giant distillation experiment, evaporating chemicals from the tropics and transferring them north. The cold air of the Arctic acts as a cleansing system for the rest of the Earth at the cost of chronic pollution in the region once thought to be pristine. Once the poisons reach Arctic waters, they concentrate further as biological processes take over. They reach their highest concentrations in animals at the top of the food chain and humans.

(Adapted from *The Guardian*)

Text 7. PROFESSIONAL BRIBE-TAKERS?

To take or not to take bribes is not the question. We have all given bribes at least once, like when you need a new passport in an hour, not in a month or 45 days which is a standard procedure. Or you want something else arranged for yourself quickly and effectively. And it is not necessarily an envelope slipped into one's pocket or passed under the table. It can be arranged as a pay rise, royalty, sponsorship, donation, investment, a book published on a priority basis, or an act of perfectly selfless aid, say, to a court of law, like a shipment of stationery and office equipment. After all, there is a note warning of their shortage attached to every courtroom or office door.

They say the only way to get something done is by buttering palms, that it was always there. And, of course, that is true.

Bribery really is a vital component of the system of interaction and corruption that exists. However, the situation with corruption in general is considerably more complicated because its power to ruin is not bribery in itself but in the professional deformation of civil servants.

Professional deformity manifests itself primarily by negative changes in the individual and professionally required qualities, affecting the public servant's professional orientation and professional thinking. Professional deformity emerges as the result of repeated negative typical situations over a lengthy period. The most

dangerous personality change is found in the civil servant, in that it leads to legal nihilism and premeditated violations of the law.

This deformity could be defined as a manifestation of the civil servant's legal nihilism and acting unlawfully, distorted view of his/her performance as a public servant, simplification of professional stereotypes, along with weakening the reliability of the official's morals and will. The main cause of such legal nihilism and unlawful conduct is the impunity and lack of public control over the bureaucrat's performance.

An important sign of professional deformity is psychological instability. This is manifested in one's inability to resist negative influences in the line of duty. These negative influences include unlawful pressure from law enforcement authorities, ranking officials (one's immediate superior, business people, etc.) to make illegal decisions, and complicated external working conditions.

The third sign is the trend to distort requirements in terms of unbiased reflection of circumstances existing within the state: ignoring realities, weakened self-criticism, as well as an inability to view one's work and external circumstances critically. Here it is not so much one's inaptitude as the reluctance or loss of the ability to assess circumstances in an unbiased manner. Thus professional deformity consists not in the initial absence of qualities or lack of professional training but in their transformation or atrophy.

All this makes it possible for the public servant to retain confidence in the correctness of his actions and regard errors as an inevitable possibility, caused by external factors. Among typical techniques of self-justification are constant references to inadequate legislation and the pure formality of its requirements; objective circumstances and hardships, such as overloaded schedule, constant shortage of time; unlawful decisions motivated by national interests, instructions from above, the complexity of one's duties, etc. total self-justification under any circumstances is the main symptom of civil servants' professional deformity.

All these changes are determined primarily by the imperfect organization and bad conditions of professional activity. Such changes emerge and manifest themselves at various levels – processes, status, and personal qualities, conscious and subconscious. Often, the most important changes come down to the hypertrophy of vital professional traits. Thus, vigilance turns into suspiciousness, confidence into self-confidence, contentment into indifference, diligence into pedantry, and so on. Secondly, it means the emergence and development of negative traits: cruelty, vindictiveness, rudeness, permissiveness, and cynicism. A certain mental state like disillusionment, boredom, or irritability emerges and becomes dominant. Thirdly, it is the suppression and subsequent atrophy of certain traits that become objectively assessed as being of minor importance, or even unnecessary. There is a loss of confidence in citizens' law-abiding conduct and in the effectiveness of struggle against lawbreaking, especially corruption.

Proceeding from all this, the apparent conclusion is that bribe-taking is only one of the signs of professional deformity in civil servants. Thus fighting corruption requires a more skillful and systematic approach, whereby its causes and conditions facilitating abuse of office could be eliminated, primarily within the social category of civil servants.

Text 8. SPYING IN BUSINESS FIRMS: A COMPETITIVE NECESSITY?

Is it ethical to spy on competitors? An increasing number of American and foreign firms have corporate intelligence systems. Some people believe that unless a firm maintains a top-level corporate intelligence system, it can forget about being technologically competitive.

AT&T launched an on-line computer service referred to as AAA (Access to AT&T Analysts). It's designed to help employees learn from the thousands of other employees with specialized insight about competitors. Employees are invited to fill out questionnaires identifying their areas of expertise. Users can log in key words and receive a list of company experts on various technologies, along with their job titles and telephone numbers.

Employees also used AAA to share information about competitors. What are competitors doing? How successful is a new experimental product that a competitor is working on? Who's on the competitor's experimental development team?

American, German, and Japanese companies and others make it a policy for employees to visit trade shows to collect competitors' literature. In sophisticated companies the literature, gossip, and anything else collected at the trade show are analyzed by intelligence experts. These experts also have employees to attend seminars, take visitation tours, and collect professional papers.

Is all of this intelligence activity ethical? Even if you believe it's not, what are you going to do about intelligence or information gathering? If you ignore information, your firm may be at such a competitive disadvantage that it eventually goes out of business. Lobbying for new laws to control abuses in the intelligence area may not bear fruit for years. It takes years for laws to become operational.

Intelligence gathering poses many questions. It's an ethical dilemma for firms that rely on technological and innovative progress to survive. Firms that don't gather intelligence can be quickly knocked out of business.

*(Adapted from "The New Race for Intelligence" by Richard S. Teitelbaum,
Fortune, November 2, 1992, pp. 104 - 7)*

Task 6.35. Read the following texts and express your opinion on ethical or non-ethical issues contained in the newspaper features:

Minister: I'm giving up my £ 70k-a-year car

By Jonathan Oliver (DEPUTY POLITICAL EDITOR)

THE Minister for Patriotism is off to a modest start - he's given up his official limo to save the taxpayer £50,000 a year.

Instead of the chauffeur-driven car that normally comes with a ministerial job, Michael Wills, the man in charge of Gordon Brown's 'Britishness' agenda, uses public transport and taxis - setting an example that his colleagues will come under pressure to follow.

The annual bill for ministerial cars and their drivers is around £7 million, or £70,000 per Minister.

Ministers justify the perk in a variety of ways. Some cite security, while others say they need a car to transport their red boxes containing sensitive documents.

However, Mr Wills's sacrifice proves they can do without.

He uses the Tube, buses and taxis to get around London. And he takes the train to visit his Swindon North constituency.

Officials say the annual cost of his work-related journeys is around £20,000 - a net saving of £50,000. A friend of Mr Wills said: 'Michael was offered the car, but he saw it as a waste of money for the taxpayer and he reckons he can get around just as easily by other means.'

Junior Ministers usually use Toyota Priuses, Ford Mondeos or Rover 75s. The perk comes on top of a generous £100,000 salary.

Mr Wills, 55, a former diplomat, was made deputy to Jack Straw in the Justice Department earlier this year.

He recently announced plans to consult the nation on a statement of 'British values'.

(From the mail on Sunday September 30, 2007 p. 10)

Counting the Costner

Star admits: I've blown £20m on inventions that I thought would save the world

HOLLYWOOD actor Kevin Costner has squandered more than £20 million of his fortune on doomed investments to save the planet, he admits today.

The Oscar-winning Dances With Wolves star plunged the cash into 'green technology', forming two companies to develop his passion.

His first venture championed a revolutionary method to clean up major oil spills and the second tried to develop a successful non-chemical battery. But both projects failed and he lost the entire investment. He says in an interview in today's Live magazine: 'I've invested enormous amounts in technologies I thought would help the world.'

"There's nothing to show for the millions I've invested. My God, most people would want to die if they lost \$1,000 or \$100,000. I've lost \$40 million plus."

'But I knew that if I was right it would change things in an incredibly positive way. Do I regret that? Yes. Has it changed my life one bit? No, because I haven't been moved by money. Costner, 52 - whose 1994 divorce from first wife Cindy Silva cost him £40 million - was first moved to action by the 1989 Exxon Valdez oil spill, when the tanker struck a reef and lost 11 million gallons of oil off Alaska.'

Horrified by the primitive methods used to battle spillages, he set up Costner Industries Nevada Incorporated with his brother Dan. They discovered a technology used in the nuclear industry to separate chemicals by centrifugal force and set about adapting it. But the project failed.

Next, he created a subsidiary to launch a battery with a flywheel that could store four times the energy of an ordinary one. The firm even had a contract to make them for Nasa, but the deal lapsed.

Costner's movies, which also include box-office smashes *The Bodyguard* and *Field Of Dreams*, have grossed more than £1 billion.

But he has suffered bad luck in other ventures as well as his green projects. However the star remains philosophical. 'I'm not the shrewdest businessman,' he admits. 'I'm more of a dreamer.'

• *Read our full interview at www.mailonsunday.co.uk/kevin*

(From the mail on Sunday September 30, 2007 p. 41)

Is this really what it's like to be elderly in Brown's Britain?

By Polly Dunbar

THE Government spin machine was accused of peddling a false view of old age last night after it was revealed it had paid a PR company to portray all pensioners as happy and carefree.

Organisations involved in the first UK Older People's Day tomorrow have been instructed only to use promotional images in which elderly people look affluent and active.

Out go pictures reflecting the reality of life for the majority of older people, including an older man and woman slumped in armchairs, presumably in a care home, and an elderly woman appearing distressed.

In come photos such as a youthful-looking couple laughing as they run across a beach, a woman about to work out in a gym, another woman happily gardening, a couple cuddling on holiday and a man enjoying a game of tennis.

The approved images are marked with a large tick, while those to be avoided are marked with a cross.

The instructions form part of a guideline pack sent to organisations involved in the Department of Work and Pensions' Generation Xperience UK Older People's Day, which include the charities for the elderly Help the Aged, Age Concern and The Beth

Johnson Foundation, as well as retail giants John Lewis and B&Q. The Government booklet, produced by PR company The Red Consultancy, urges: 'Any imagery used should be consistent with the upbeat, celebratory nature of the campaign. Avoid using images that reinforce incorrect stereotypes about older people's lifestyles.'

It continues: 'Contrary to common misconceptions, the UK's over-50s now have greater opportunities to lead healthy, active and fulfilling lives than ever before, largely thanks to improvements in services and pension reforms.'

But critics said the chosen images were a far cry from reality for most older people at a time when more than a fifth live in poverty.

Nigel Waterson, Tory spokesman for pensions and older people, said: 'This just shows spin is alive and well under Gordon Brown.'

'Lots of older people have no reason to look or be happy - two million are living in poverty, 125,000 have lost their pensions due to the Government and many are facing penury in old age.'

Some of the organisations backing the day have also criticised the images. Alan Hatton-Yeo, director of the Beth Johnson Foundation, said: 'I would not have chosen these pictures because they are clumsy and we are not using them.'

'The Red Consultancy clearly didn't think carefully enough about the implication of the pictures. All the ones they have chosen seem to show middle-class people enjoying activities a lot of elderly people cannot participate in.'

Paul Bates from Help the Aged added: 'There's nothing wrong with showing positive images of old people but at the same time, it must be recognised that many old people are not fortunate enough to have the finances or physical abilities to do active, fun things and take holidays.'

A spokeswoman for the Department of Work and Pensions said: 'Generation-Xperience UK Older People's Day is about celebrating the huge contribution that older people make to society.'

'Part of that is about tackling negative and outdated stereotypes of older people, the majority of whom see age as an opportunity - not a barrier.'

(From the mail on Sunday September 30, 2007 p. 42-43)

Rudeness rules... even the credit card man says I've got Alzheimer's

THE words 'zero tolerance' were uttered at last week's Labour Party conference, a phrase we haven't heard since the Government's first term in office.

Home Secretary Jacqui Smith was referring to a tougher stance on crime, but I think it's high time we applied that same edict to the soaring levels of rudeness which have infected this country.

Is it me, or has it become almost impossible to go about your daily business without being sworn at, or tooted at because you were *one millisecond* late in respond-

ing to an amber light on a *Sunday*? Unless you are an on-call heart surgeon, really, what is the problem?

Another idea, also mooted last week, was that foreigners learn how to form an orderly British queue before they can feel fully integrated into our society.

Have the people who come up with these daft schemes ever tried to board one of London's No 38 bendy buses on Piccadilly?

Never mind the scrum; that's the easy part.

Persuading the driver, hellbent on mowing you down, to please wait while you purchase a ticket at the kerbside machine always seems to elicit a stream of invectives before the doors are slammed in your face.

Taxis aren't much better. I know I will never be picked up by a black cab again if I write this, but aren't all the notices inside, telling you off, a bit much, given how high the fares are?

I always make the mistake of thinking the driver is talking to me when I hear him chirruping away and I politely try to join in, only to be told crossly he is 'on the phone'. Ah. Sorry.

In my local Sainsbury's, which I visit every morning to buy newspapers, I see the same trio of young women sitting chatting behind their tills.

Although I am sure they must vaguely be able to recognise me by now, they can never be bothered to interrupt their conversation to say 'hello', or mumble 'thank you' at the end of the transaction.

The only mantra they unfailingly recite, not once looking me in the eye, is the annoying: 'Do you have a Nectar card?'

I feel like screaming: 'No! I don't! I didn't have one yesterday, and I haven't rushed out and applied for the wretched thing, whatever it is, in the brief passage of time since!'

Perhaps I am feeling particularly fragile having spent the past three weeks at fashion shows in New York, London and Milan.

But at least that exercise, where I have been made to 'step away from the red carpet' by innumerable stony-faced morons in dark suits with walkie-talkies (and that was just the glossy magazine editors), has allowed me to conduct my own survey of which country really is the rudest in the world.

And I am afraid to say it is Britain.

Politeness is the glue that holds our society together, but it seems we have all retreated, clam-like, into our own tiny worlds, solicitous only of those we are frightened of. Anyone else is treated with contempt.

Why do people you live next door to fail to smile, or say hello? I'm sure new technology is a factor. How many times have you sat next to someone in silence while they fiddled with the Blackberry in their lap, or sent texts like a demented teenager?

How can anyone be that busy, unless they are the Prime Minister?

And whatever happened to the customer being king?

After keying about a million digits into a phone before you can speak to someone who has a pulse, why do they always respond as if they are a robot?

I recently phoned my credit-card company to complain about two suspicious items on my bill, and the man on the other end told me I could be suffering from 'early-onset Alzheimer's'.

I would have been flattered at the 'early' had he not been so shockingly out of order, although I have to admit my case doesn't quite hold water because a few days later I remembered I had bought two aromatherapy candles for precisely those amounts; they were supposed to make me less stressed, not more.

AND don't get me started on how rude children are these days. Parents should be worrying less about whether their offspring has inhaled a peanut, and more about whether or not he or she has sent a handwritten thank-you note, ever.

Mums and dads. If someone gives your child an expensive outfit, make sure he or she is wearing it the next time you see them. It's as simple as that.

This new culture of rudeness must be stamped out.

The other night, I tackled a woman who had the temerity to steal my cab. I ran after the vehicle, opened the door and politely told her to get out.

She disembarked sheepishly, the cabbie looking on in disbelief.

I am, if Justice Secretary Jack Straw is to be believed, a have-a-go hero, standing up for good manners.

I suggest you become one too.

(From the mail on Sunday September 30, 2007 p. 28)

Fred Dibnah would have loved this

Demolished: Vast cooling towers at world's first nuclear power station in Sellafield

THEY were massive symbols of Britain's atomic age - and yesterday they were reduced to rubble in seconds.

In scenes which would have warmed the heart of demolition expert Fred Dibnah, the four vast cooling towers of the world's first commercial nuclear power station were brought crashing down by explosive charges.

The 290ft-high Calder Hall towers at Sellafield in Cumbria were blown up in pairs - to the gasps of hundreds of people who had gathered to watch.

Paul Brennan, manager of the site, raised a clenched fist and whooped with joy as the first towers fell. He said: 'It was a surgical method of bringing down the towers without putting people at risk. Personally, it is a big day for me.'

The demolition was the culmination of three years of planning.

The power station was opened by the Queen in October 1956. In its early life it was primarily used to produce weapons-grade plutonium but from 1964 its main role was providing commercial electricity. The reactor was shut down four years ago, but nuclear waste is still reprocessed at Sellafield.

Watching the blasts unmoved was Jim Young, 66, who began work at the plant before the towers were even finished. He said: 'No twinges of sadness. I am not sentimental -I have just come to see the big bang.'

(From the mail on Sunday September 30, 2007, p. 27)

Smells Kitchen New York neighbours say the stench from Ramsay's restaurant is unbearable

From Sharon Churcher

IN NEW YORK

GORDON RAMSAY is causing a stink in New York, where neighbours claim unbearable smells are wafting from his restaurant.

Residents in an elegant apartment block have complained to health inspectors about the stench of duck and bacon from a giant extractor fan.

They are also furious about noise from the fan and an air-conditioning unit in the kitchen.

The racket it makes has been measured at 57 decibels, they say -above the limit for local events such as rock concerts. They claim the row is ruining their sleep and hitting home values.

Shirley Lemmon, who is the head of the residents' association, said: 'This is ruining lives. The fan is this giant contraption that looks like a praying mantis, almost two storeys tall, and the smells from it at times are horrifying.'

'First thing in the morning on the weekend the smell of bacon permeates the air and we can't open our windows.'

'It also is particularly intolerable when they are preparing duck at 3am. His air-conditioning unit sounds like you are riding in the back of a plane, and it can be on 24/7.'

'We had one person who moved out and sold his apartment. Another who moved in before they turned the equipment on has been unhappy because this is hurting his property value. The city codes say the sound cannot be above 45 decibels. Gordon Ramsay's has been recorded at 57.'

Miss Lemmon said residents want the restaurant, which is set in the London NYC Hotel, to be given a formal code-violation notice. Ramsay is already under siege from unimpressed critics. The New York Times' Frank Bruni awarded his establishment two stars out of four, describing the food as 'predictable'.

A spokesman for Ramsay said the chef was unaware residents had any complaints.

(From the mail on Sunday September 30, 2007 p. 50)

Ramsay the Scrooge gives staff P45s for Christmas

WITH A FLOURISHING television career, a much-talked-about restaurant launch in New York and eight Michelin stars to his name, Gordon Ramsay has every reason to celebrate this Christmas. Mandrake learns that the fiery Glaswegian chef has, however, left staff at one of his most celebrated London dining rooms worrying how they will cover their festive bills, after he informed them that they will all be made redundant in the New Year.

"Everyone is stunned," says my man at the Connaught hotel in Mayfair, where more than 50 of the chef's employees have been told that they will receive only minimal payoffs, apparently amounting in one case to £8,000 for a waiter who has worked at the restaurant for almost 30 years.

"There is a feeling that Ramsay has treated his staff appallingly. Although he is always boasting about how many restaurants he runs, he hasn't offered them jobs elsewhere and has told them that they will get only the statutory minimum. In most cases, that's just a few weeks' wages."

A spokesman for Ramsay, who has an estimated personal fortune of £60 million, says he "regretfully" decided to make the staff redundant. Derek Quinlan, the Connaught's Irish owner, had informed him that the hotel would be closing its doors in March for six months, for refurbishment. "It would be uneconomical for us to keep staff on," claims the spokesman.

Ramsay took over the restaurant, **with** many of its existing staff, in 2002. He **owns** eight more dining rooms in London **and has** great plans for expansion overseas. His spokesman said, however: "Our **other** restaurants are fully staffed."

This is not the first time that the 40-year-old chef has provoked anger with **his** treatment of experienced employees. In 2003, there was an outcry when I disclosed that Angelo Maresca was retiring after 25 years as the much-loved maitre d' of the Savoy Grill following Ramsay's takeover. He was promptly snapped up by Sir Rocco Forte at Brown's hotel in Mayfair.

Anthony Lee, the general manager of the Connaught, clearly takes a different approach. "All the staff who work at **the** hotel [rather than Ramsay's restaurant] will be retained on full pay for the six months that we are closed," he tells me. "I am the custodian of the soul of **the** Connaught and, for me, our staff are the be-all and end-all."

(*From the Sunday Telegraph
December 24, 2006 p. 30*)

And for Bono, a knighthood in recognition of service to Africa

OLGA CRAIG

BONO, the larger-than-life frontman of the Irish band U2 and Third World campaigner, has been awarded an honorary knighthood for services to the music industry and humanitarian work. It is the third time his work has been recognised in the past three years. In 2003, he was presented with the Legion d'Honneur by President Jacques Chirac on behalf of the French government and a year ago he was voted *Time* Person of the Year in recognition of his work promoting justice and equality.

The rock star, who follows in the steps of fellow Dubliner Bob Geldof in receiving the award, will not be entitled to use the title "sir" because he is not a British national. Geldof received his award in 1986 after raising awareness as well as millions of pounds for struggling third world countries through the Live Aid event. Along with

Geldof, Bono, 46, was instrumental in ensuring the recent Live 8 concerts were a massive success.

Yesterday in a letter to Bono, Mr Blair said the musician had played an invaluable role in the run up to last year's G8 summit, which focused on helping poor nations in Africa.

He said: "I know from talking to you how much these causes matter to you. I know as well how knowledgeable you are about the problems we face and how determined you are to do all you can to help overcome them. You have tirelessly used your voice to speak up for Africa.

"I want personally to thank you for the invaluable role you played in the run up to the Gleneagles G8 summit. Without your personal contribution, we could not have achieved the results we did.

"So thank you and I look forward to continuing to work together to maintain momentum on Africa, and ensure leaders around the world meet the promises they have made."

Mr Blair added that Bono whose real name is Paul Hewson had proved an inspiration in both his music and determination to tackle global poverty.

Last night a spokesman for the singer said he was extremely flattered to receive the award. Previous non-British recipients of the honour, which is granted by the Queen on advice of the Government include Bill Gates, Placido Domingo, Rudolph Giuliani and Steven Spielberg.

*(From the Sunday Telegraph
December 24, 2006 p. 3)*

Task 6.36. You may find additional information on ethics for your professional activities in the texts suggested:

A Code of Professional Ethics

A Guide to Professional Conduct in the Field of Educational Communications and Technology

It seems to have entered into all areas of professional life. The reputations and careers of prominent politicians have been tarnished by evidence of ethical misconduct. Well-known television evangelists have been caught in improper behavior. Manufacturers of critical parts of airplanes and other equipment have been detected substituting inexpensive, inferior parts in the manufacturing process. Sports heroes have been suspended, banned, or had their accomplishments stricken from the record books because of rule violations or illegal acts. Wealthy, highly respected financial figures have been imprisoned for illegal dealings on the stock market. Major universities have received sanctions for improper recruitment and support of athletes. Producers of canned food products have been convicted of using less nutritious, substitute ingredients in place of those listed on their product labels. Computer hackers have illegally gained entry into databases for personal gain. Researchers have fabricated data in order to generate academic publications. Pharmaceutical companies have been indicted for bribing federal agencies to approve their products for release on the marketplace. Police officers have been caught collaborating with criminals in order to profit from illegal activities. Indeed, even a major education agency has been convicted and penalized for illegally duplicating and distributing copyrighted materials.

The result, during the past decade, has been a growing awareness and concern about unethical conduct. This concern reflects a desire in many segments of our society that guidelines be developed and measures taken to heighten an awareness of the importance of ethical behavior. The reaction to the problem is coming from many sources. One of the first and most visible was a project of the Annenberg Foundation and the Corporation for Public Broadcasting to develop and broadcast a series of television programs, Ethics in America, that featured a number of prominent individuals discussing ethical issues.

Since the Annenberg Project, there have been many other efforts to focus public attention on ethical behavior. There has been a significant increase in the number of books and newsletters on the subject. An illustration of the breadth of interest in this subject is the fact that one book on ethical management brought together Kenneth Blanchard (coauthor of *The One Minute Manager*) and Norman Vincent Peale (author of *The Power of Positive Thinking*) as its unlikely pair of coauthors. A professional association concerned with performance and instruction conducted a major effort to identify ethical issues related to business and industrial training in order to formulate a code of ethics to govern professional behavior in that field. A major accounting firm carried out a three-year, five million dollar project to prepare instructional materials on business ethics for use in business schools in major universities throughout the United States. Even before these materials were developed, many of the major business schools

were introducing and expanding their instruction in this area. Indeed, one of the top 10 business schools in the nation now requires that all MBA graduates sign an ethics code, which was developed jointly by faculty and students, before receiving their degrees. But schools of business are not the only area within universities that are focusing attention on ethics. A major university that was penalized by the NCAA for improprieties in its athletic program now requires all varsity athletes to take a special course in ethics.

Fortunately, the field of educational communications and technology has not been put in a position that it must suddenly develop procedures for dealing with issues of professional ethics. The Association for Educational Communications and Technology (AECT), a professional association representing members who work in a wide spectrum of specialties within the field, has consistently provided guidance in this area. Recognizing that having a code of ethics is an essential characteristic of a profession, AECT has had such a code and has maintained procedures for dealing with ethical issues since its formation as an association. Furthermore, through an active committee on professional ethics, this code is carefully reviewed each year and a number of activities have been initiated to remind Association members of the provisions of the code and appropriate interpretations of its principles.

One such technique that has been used to promote awareness and provide interpretation has been to publish a series of ethics columns in the AECT professional journal TechTrends.

(Adapted from the Internet)

Code Of Ethics of Engineers

The Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

- I. using their knowledge and skill for the enhancement of human welfare;
- II. being honest and impartial, and serving with fidelity the public, their employers and clients;
- III. striving to increase the competence and prestige of the engineering profession; and
- IV. supporting the professional and technical societies of their disciplines.

The Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.

5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.

6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession.

7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

(Adapted from the Internet)

Commitment of the Profession to Society

In fulfilling obligations to society, the Association on behalf of the profession:

1. Shall promote safe and healthy technological learning environments.
2. Shall promote positive and minimize negative environmental impacts of educational technologies.

Background: For more than 10 years the Professional Ethics Committee has greatly benefited from the leadership of Paul Welliver toward increasing the awareness of professional ethics among Association members. Among other actions, the Committee has reviewed and revised the Code, added one new principle, organized presentations, published scenarios interpreting each principle in *TechTrends*, and currently has a book in production.

However, there has been little enforcement and in the words of James D. Finn in the first issue of *Audio Visual Communications Review*, "The publication of codes of ethics and manuals of standards in itself guarantees nothing." In the absence of complaints from our clients, whether they are trainee airplane mechanics or sixth graders, Association members have not been disciplined for violations of the Code.

The Professional Ethics Committee is active, nevertheless, and has on request provided letters in support of members who stand by the Code in their professional roles. It has also facilitated the processing of complaints between members on matters that may be characterized as thoughtlessly offensive or unintentionally rude. Formal hearings have not occurred and the Committee's procedures were modified in the last couple of years to be consistent with the normal practice of informal resolution.

The Committee became concerned in the early 1990s that the Code may lack true effectiveness. Protecting the public by policing ourselves to identify quacks and charlatans is not possible. Indeed, we should become more competitive with similar professional organizations involved with technology by looking outside of the Association and being explicitly committed to society.

The Committee worked on the problem for several years. First, the Committee analyzed the situation to understand what it meant. Second, the Committee considered possible actions and outcomes. Third, the Committee decided to add a new section to the Code. Fourth, the Committee deliberated over constructing new principles.

The Proposed Section 4 of the AECT Code of Professional Ethics Establishing Section 4 in the Code will remedy the deficiency in social obligation. The principles in this section will show increased responsibility. The Committee will act by developing guidelines, where they are needed, and by publishing informative scenarios. For example, a draft scenario for Principle 1 explains that furniture as well as equipment and software must be appropriate when setting up computer learning stations. A draft scenario for Principle 2 indicates that nonrenewable resources are a significant factor in educational computing. Other principles under consideration for Section 4 uphold cultural diversity, intellectual freedom, and open access to information regardless of delivery medium. The Committee welcomes any suggestions for further ways to demonstrate how the Association is committed to society in our professional ethics.

Suggestions for Further Reading

Abbott, A. D. (1988). *The system of professions: An essay on the division of expert labor*. Chicago: University of Chicago Press.

Coady, M., & Bloch, S. (Eds.) (1997). *Codes of ethics and the professions*. Victoria, Australia: Melbourne University Press.

Gieryn, T. F. (1995). Boundaries of science. In S. Jasanoff, G. E. Markle, J. C. Petersen, & T. Pinch (Eds.). *Handbook of science and technology studies* (pp. 393-443). Thousand Oaks, CA: Sage.

Macdonald, K. M. (1995). *The sociology of the professions*. Thousand Oaks, CA: Sage.

Tannen, D. (1998). *The argument culture: Moving from debate to discussion*. New York: Random House.

Yeaman, A. R. J. (February 20, 1998). Chair for *Professional Ethics in Practice presented by J. N. Eastmond, V. S. Napper, R. G. Nichols, A. C. Sherry, & P. W. Welliver*. Association for Educational Communications and Technology convention, St. Louis, MO. [Reported by Heebner, A. L. (1998) *TechTrends* 43(3), 58.1]

Yeaman, A. R. J., Koetting, J. R., & Nichols, R. G. (February 19, 1998). The 14th Foundations Symposium: *Continuing to Explore and Question the Theory/Practice of Our Field*. Association for Educational Communications and Technology convention, St. Louis, MO. Reported by Hall, L. (1998) *TechTrends* 43(3), 4849.1

Yeaman, A. R. J. (February 14, 1997). *The cyborg discourse*. In the session on *Histories of Educational Technology: Considerations and Techniques*. Association for Educational Communications and Technology convention, Albuquerque, NM. Reported by Shutkin, D. S. (1997) *TechTrends* 42 (3), 52-53.1

Yeaman, A. R. J. (February 13, 1997). *Searching for moral discourse relevant to professional ethics*. Association for Educational Communications and Technology convention, Albuquerque, NM. Reported by Bromley, H. (1997) *TechTrends* 42(3), 50-51.1

Yeaman, A. R. J. (1997). The discourse on technology. In R. M. Branch & B. B. Minor (Eds.), *Educational media and technology yearbook* Volume 22 (pp. 46-60). Englewood, CO: Libraries Unlimited.

(Adapted from the Internet)

Introduction to Codes Compilation

Center for the Study of Ethics in the Professions (CSEP) was founded in 1976 to promote education and scholarship on the professions, with special emphasis on the ethical and social responsibility issues associated with professional education and practice. To that end, CSEP pursues a variety of research, teaching and public program activities. In support of these programs the Center maintains a resource collection on the professions that serves the burgeoning informational needs of students, scholars, practitioners, and the public alike.

The collection contains printed materials covering a wide range of professional fields, with the types of items as varied as the kinds of information they convey. Included are monographs, bibliographies, professional directories, government reports, hearings and regulations, court decisions, journals, and newsletters, dissertations, unpublished papers, and conference proceedings. The collection is open to all and professional assistance is available. Visitors are welcome to make inquiries by mail or telephone.

As a special service, the collection houses an extensive inventory of statements on professional responsibility and freedom promulgated by government and other groups concerned with the rights and responsibilities of professionals. The documents take many forms, including, codes of ethics, advisory opinions, resolutions, policy statements and reflect such diverse perspectives as those of private practitioners, employed professionals, recipients of professional services, government bodies and so on. In the belief that these statements can serve useful educational and research purposes, CSEP publishes this COMPILATION of the items currently available, most of which can be obtained from the Center. Ordering information is given on the following page.

We welcome suggestions and copies of materials for inclusion, as well as corrections of any of the items currently included. All correspondence regarding the COMPILATION should be directed to the CSEP Librarian, Center for the Study of Ethics in the Professions, Illinois Institute of Technology.

(Adapted from the Internet)

Professional Ethics and Computer Science/Information Systems

If you are looking at this page, you probably have an interest in (or have been told by a professor to have an interest in) computers and ethics.

Ethics One definition of ethics, according to Merriam-Webster, is "a set of moral principles or values". You may derive your own personal ethics from many sources: your family and culture, your religion or faith, the legal system where you live, etc. However, ethics in general is not the topic of this web page.

Computing Ethics Sometimes you will hear someone refer to "computing ethics", which is a whole range of ethical questions surrounding computer science and the use of computers.

Professional Ethics This web page discusses professional ethics (or professional practice): the "principles of conduct" that we agree to be governed by as computer scientists and engineers.

As a student at Stony Brook, you have agreed to follow the university's rules regarding academic honesty and appropriate conduct. These are a statement of professional conduct for students. Faculty have their own rules regarding professional conduct (the Computer Science faculty have adopted a statement which will soon be on the department's web site). Depending on where you are in life, you may have several different sets of professional ethics to adhere to. It is important to think about who you are, what roles you play, and how you can act professionally in those different roles.

This web page is one place for you to start thinking about professional ethics.

(Adapted from the Internet)

Center for the Study of Ethics Codes of Ethics Online

In June 1996, our Center received a grant from the National Science Foundation to put our extensive collection of codes of ethics on the web. We included those codes of ethics of professional societies, corporations, government, and academic institutions, of the over 850 codes we have in our paper archive, who gave us permission to include their code. Earlier versions of codes of ethics of some organizations represented are available to allow researchers to study the development of codes. A literature review, an introduction to the codes, and a user's guide are included.

Navigating the Codes: the most direct point of contact with the codes is achieved by

- browsing the Index of Codes, or an alphabetical list of codes, or
- searching the codes using our customized Google search engine.

Guide to Codes of Ethics Collection

Introduction An introduction that covers the debate about the function and value of codes of ethics.

The Index of Codes The codes, organized by professional category, are drawn from the continually growing collection held by CSEP's Library and from the web.

Search the codes here.

Compilation of Codes in the paper and online collection. Codes of Ethics divided into the following broad categories, Professional and Trade, Business, Government, and Other, and then listed alphabetically by association name.

Permissions Information We have published online only codes for which we have received permission from the firm or organization that produced the code.

Using Codes of Ethics This guide offers a context for using a code of ethics by considering a sample case.

Writing a Code of Ethics Find here some print and online sources for writing a code of ethics for your organization.

Authoring a code: Observations on process and organization This paper was written by Andrew Olson, who worked on the project just after completing his undergraduate degree.

Bibliography: Books, Articles and Cases This list of materials, many of which offer case studies, will help you use your profession's code.

Other Online Sources of Codes of Ethics Having difficulty finding an organization's code of ethics? Try our links to other collections of codes of ethics which are available online.

Participants in the Project Who has helped make this material available online?

There are many computer science-related organizations that have codes of ethics (Berleur and Brunnstein 1996). However, most computer scientists are members of the ACM or the IEEE, and so have agreed to be bound by one of the following:

- The ACM Code of Ethics
- The ACM/IEEE Software Engineering Code of Ethics and Professional Practice
- The IEEE Code of Ethics

Printouts of the ACM/IEEE code of ethics are available in the Computer Science Building outside the office of the undergraduate secretary.

What you can do: Look up one of the above codes of ethics. Read it. Print it out and save it for reference. It is there to protect and guide you, as well as to protect those you work with and for.

Most large companies have an ethics officer, who is there to educate and advise employees about issues relating to professional practice. You may meet one or

more of the ethics officers from local companies, such as CA, Symbol and Reuters, during your time at Stony Brook.

Organizations that are broadly considered to “be about” ethics of computing, or professional practice in computer science, include:

- Computer Professionals for Social Responsibility
- The Centre for Computing and Social Responsibility
- The Center for Applied Ethics, page on Computer and Information Ethics
- The Web Clearinghouse for Engineering and Computing Ethics
- ACM SIG on Computers and Society
- The Online Ethics Center for Engineering and Science at Case Western University
- The Research Center on Computing & Society at Southern Connecticut State University

What you can do: Look up one or more of the organizations above. Become aware of the ethical issues computer scientists and engineers face. Know that these organizations may be resources for you to use in case of an ethical conflict. Think about becoming involved.

Teaching Professional Ethics in Computer Science and Information Systems

The following is a list of listings of case studies relating to professional ethics and computer science or information systems:

- Online Ethics Center: Cases about Computers and Software
- ComputingCases.org

(Adapted from the Internet)

APPENDIX. KEYS TO THE TASKS

Key to tasks 6.2. and 6.3. Discussion of some ethical problems:

Chairman: – Shall we get down to business? I have a great pleasure in opening the discussion. Are there any comments, opinions or questions to the speaker?... Prof. Hill, please.

Prof. Hill: – I've listened attentively to the presentation and I'm deeply impressed by the spiritual situation in the world. I want to ask Mr. Biletsky a question. In what way will your country try to get out of the troubles you've mentioned?

Prof. Biletsky: – This is a due question. You know that Ukraine has achieved democracy. This is an important first step in the improvement of society. But democracy, as wonderful as it is, is not enough. Democracy has not solved all the problems of America. I think you agree with me, Mr. Hill. There must be an accompanying predominant spiritual sense of purpose found in society. I would say that knowledge and appreciation of genuine spiritual values in a democratic society is the way of improving the spiritual situation. This is the policy of our country, and this is what we want to pass on to the next generation.

Peter Koval: – My name is Peter Koval, I am a student at Kyiv National University. As the young generation has been mentioned, I want to raise a question: What is the role of education in the humanization processes?

Chairman: – Who'd like to answer this question?... I give the floor to Dr. Fulier from Sorbonna University.

Dr.Fulier: – I would answer your question by Plato's words: "If you ask what is the good of education I shall answer that education makes good men, and good men act nobly and conquer their enemies in battle, because they are good." My friends, I want to warn you that the enemies are at the gates of our common home, they are alienation, illegal drugs, crime, injustice, apathy, and lack of moral purpose. Good education can conquer these enemies.

Olha Dolenko: – I'm Olha Dolenko, a post-graduate student at Lviv Polytechnic University. Dr.Fulier, could you enlarge on this question, please? How do you think moral knowledge is to be acquired? Can one person, a teacher, perhaps, help others to acquire it? And if so, in what way? By direct instruction? By good example? By advice? By reward and punishment?

Dr.Fulier: – Formation of human values in children and adults is a long and permanent process. The role of the family, the state, the school and the church are very important in moral training, as well as the role of arts, humanities, literature and music. The matter is that, first of all, the society should be moral. If it is so, there is nothing to be afraid of.

Chairman: – Thank you. Unfortunately, our time is up. I think that the discussion was highly spirited. Many ideas have been expressed that will long occupy our minds and invite further studies. Let me thank you all for participation.

Key to tasks 6.4. and 6.5. Text “Global Warming and Greenhouse Effect”.

It is believed that human activities are responsible for the drastic changes in the Earth's temperature causing global warming, holes in the ozone layer and major changes in climate patterns.

Ozone in the stratosphere shields the Earth from much harmful ultraviolet radiation.

Solar energy arrives in the form of short-wavelength radiation (high energy). But not all the solar energy is absorbed on the Earth's surface. One third of the heat is reflected back out into space, in the form of long-wavelength infrared radiation (low energy). Two thirds of the solar energy reaching the Earth from the sun is trapped inside the atmosphere by gases which absorb it. This is called the “greenhouse” effect. Carbon dioxide, methane, nitrous oxide, fluorocarbons and other gases in the atmosphere which trap solar energy, absorb and retain it are called “greenhouse gases”. Carbon dioxide releases from burning fossil fuels such as gas, coal and oil; solid waste, wood and wood products. Methane comes from domestic animals such as cows, landfills, rice farming, natural gas, oil and coal production, vegetation decay and transport. Sewage treatment plants may be a major source of nitrous oxide. Fluorocarbons rarely occur naturally. They are manufactured by humans for refrigeration and air-conditioning.

We need a greenhouse effect because it provides a blanket of warmth enveloping the Earth. Otherwise we would freeze! But as concentrations of greenhouse gases increase, more heat is being re-radiated back to the Earth thus increasing surface temperatures.

Each year we add more than 30 billion tons of carbon dioxide to the air, 350 to 500 million tons of methane. The carbon dioxide we release today could still be trapping heat hundreds of years from now. Methane stays in the atmosphere for more than a decade, and each molecule of methane traps heat 20 times more effectively than a carbon dioxide molecule. Nitrous oxide which we add to the atmosphere 7 to 13 million tons a year stays there for more than a century and its molecule traps heat about 200 times more effectively than a carbon dioxide molecule. So greenhouse gases are greatly contributing to global effect the temperature of the Earth would be about zero degrees F (-18°C) instead of its present 57°F (14°C). Thus, the greenhouse effect is necessary to maintain the liquid state of water in the Earth's biosphere, but things are getting a bit too warm.

ENGLISH-UKRAINIAN VOCABULARY

A

abstract	анотація, тези доповіді
abstract of a paper / report	тези доповіді
accept	приймати
accommodate <i>smth.</i> to	пристосовувати до
according to / in accordance with	згідно з, відповідно до
achieve	досягати
achievement	досягнення
acquaint	ознайомлювати
get acquainted with	ознайомитись з
acquire	набувати (знання, навички, досвід), одержувати
acquisition	набуття, одержання
advertise	рекламувати
advertisement / advert / ad	оголошення, реклама
agree with	погоджуватись з
agreement	згода, угода
announce	оголошувати
announcement	оголошення
annual	щорічний
annually	щорічно
applicant	кандидат, претендент
application	1. застосування, 2. заявка
apply	1. застосовувати, 2. звертатись до, по- дати заяву
appreciate	високо цінувати
appreciation	висока оцінка, розуміння
apprentice	учень
apprenticeship	учнівство, навчання професії
arrange	організовувати, упорядковувати
arrangement	організація, домовленість, договір
assess	оцінювати
assist	допомагати
attend a plenary meeting / session	бути присутнім на пленарному засіданні
award	нагороджувати
awareness	усвідомлення, обізнаність, знання

В

ban (<i>n</i>)	заборона
ban (<i>v</i>)	забороняти
basics	основи
be aware of	усвідомлювати
be based on	базуватися на
be concerned with	мати справу з, бути пов'язаним з
be engaged in	бути зачлененим
be in favour of	бути за (когось, щось)
be intended for	призначатися, бути призначеним
be mistaken	помилютись
benefit (<i>n</i>)	користь, вигода, прибуток
benefit (<i>v</i>)	отримувати користь
brief	стислий, короткий
bulletin / notice board	дошка оголошень

С

calculate	обчислювати
calculation	обчислення, підрахунки
capacity	об'єм, ємність, потужність, спроможність
carry out (on)	виконувати, проводити
certificate	грамота, свідоцтво, довідка, сертифікат, посвідка
certificated	дипломований; той, що має вищу кваліфікацію
certification	підтвердження, сертифікація
certified (document, product, specialist)	завірений документ, сертифікований (товар), дипломований (спеціаліст)
certify	підтверджувати, завіряти, сертифікувати (прилад, товар тощо)
chair (<i>v</i>)	головувати
chairperson / chairman / chairwoman	головуючий, -а
claim	1. вимагати; 2. претендувати; 3. amer. заявляти, твердити
claim one's right to	заявити про свої права на щось
clarify one's point of view	роз'яснити свою точку зору
classified ad	оголошення про роботу
collaboration	співробітництво, співпраця
to collaborate	співпрацювати
collaborative (effort, work, project)	зроблений у співпраці, групою людей
comment on	коментувати

competitor	суперник, конкурент
concise	чіткий, стислий
conquer	завойовувати, підкоряті
conscience	совість, сумління
consequence	1. наслідок, результат; 2. висновок; 3. важливість, значення
consider	розглядати, вважати
consideration	розгляд
contribute to	робити внесок
contribution	внесок
cope with	впоратись
countryman	земляк
craftsman	майстер, ремісник
create	творити, створювати
creation	створення
creative	творчий
creatively	творчо
criterion (<i>pl - ia</i>)	критерій, мірило
cruel	1. жорстокий; 2. болісний, тяжкий
cruelty	жорстокість
current (<i>adj.</i>)	поточний
current (<i>n</i>)	струм
curricular activity	програмна діяльність
customer	клієнт, покупець

D

damage (<i>n</i>)	1. шкода; 2. пошкодження
damage (<i>v</i>)	здавати збитків; пошкоджувати
danger	небезпека
dangerous	небезпечний, загрозливий
data (<i>pl of datum</i>)	дані, інформація
deadline	крайній термін / строк
deal with	мати справу з, стосуватися
decide	вирішувати
decisiveness	рішучість
defend	захищати
defender	захисник
defense	захист
defensive	захисний
depletion	виснаження, вичерпування (запасів)
design	проектувати, планувати
destroy	руйнувати, знищувати
destruction	руйнування, знищення

develop	розвивати, -ся / розробляти
developer	розробник
development	розвиток, розробка
device	прилад
devote	присвячувати
to be devoted to	бути відданим, бути присвяченим
discover	відкривати
discovery	відкриття
discuss	обговорювати
distinguish	відзначати, виділяти, розрізняти
distinguished	визначний, відомий
distribute	розподіляти
do without	обходить без
doubt (<i>n</i>)	сумнів
doubt (<i>v</i>)	сумніватися

E

earphones	навушники
efficiency	ефективність; <i>тех.</i> коефіцієнт корисної дії
efficient	ефективний
eliminate	1. усувати (помилки і т. ін.); 2. знищувати
elimination	усунення
emerge	1. з'являтися, виходити; 2. виявлятися, появляти
emergence	підкреслювати, робити наголос
emphasize	наймати
employ	службовець, працівник, робітник
employee	працедавець
employer	забезпечення роботою, зайнятість, працевлаштування
employment	містити, покласти у конверт
enclose	заохочувати
encourage	заохочення
encouragement	зупинитись на проблемі детальніше
enlarge on a problem	збагачувати
enrich	забезпечувати, гарантувати
ensure	підприємство
enterprise	1. розвага; 2. вечірка
entertainment	довкілля, оточення, середовище
environment	обладнувати, забезпечувати
equip	

equipment	обладнання
essential	важливий, істотний
establish / meet / miss the deadline for doing something	встановити крайній термін / вкластися в термін / не вкластися в термін
examination board	екзаменаційна комісія
exchange	обмінюватись
experience	досвід
experienced	досвідчений
extensive	широкий, просторий
extracurricular activity	позапрограмна, позааудиторна діяльність

F

facilitate	полегшувати, сприяти
fail to do something	не зуміти / не змогти зробити щось
field	галузь, поле, сфера діяльності
fill in / complete a form in block letters	заповнити бланк друкованими літерами
fruitful	плідний

G

general / panel discussion	загальна дискусія / дискусія спеціалістів
go on a business trip / scientific mission	їхати у ділове / наукове відрядження
grant a patent	видати патент
greediness	жадібність, ненажерливість
guidance	керівництво
under the guidance	під керівництвом
guide	керувати

H

handle	оперувати, працювати з
handout	роздатковий матеріал
hardware	апаратне забезпечення
harmful	шкідливий, згубний
hold a post	займати посаду
hold a conference	проводити конференцію
hush up	замовчувати

I

include	охоплювати
increase	збільшувати
indecision	нерішучість
innovate	впроваджувати нові перспективні ідеї, методи, раціоналізаторські пропозиції
innovative	раціоналізаторський, новаторський, інноваційний
innovative technologies	перспективні технології
innovator	раціоналізатор, новатор
install	встановлювати, монтувати
installation	установка
institution (<i>n</i>)	заклад, організація, товариство
research institution	науково-дослідний заклад
educational institution	навчальний заклад
institute (<i>v</i>)	засновувати, вводити, започатковувати
instructions	настанови
to give instructions; to instruct	давати настанови
instructor	інструктор, викладач (практик)
instructive	повчальний
insurance	страхування, забезпечення
integral part	невід'ємна частина
interrupt	переривати
introduction	вступ
invent	винаходити
invention	винахід
inventive	винахідливий
inventor	винахідник
investigate	досліджувати
investigation	дослідження
fundamental investigations	фундаментальні дослідження
to make / carry out / conduct investigations	проводити дослідження
investigative	дослідницький
investigator	дослідник
invisible	невидимий
invitation	запрошення
invite	запрошувати
involve	містити в собі, залучати до
involvement	залучення
issue	предмет обговорення, проблема
IT (information technologies)	інформаційні технології

J

judge	судити, виносити вирок (рішення)
judgement	судження, думка, погляд
justice	1.справедливість; 2.законність, право- суддя

L

legacy	спадщина
legal	законний, правовий
level	рівень
limit	обмежувати
location of a conference / venue	місце проведення конференції

M

manage (<i>to do smth.</i>)	змогти зробити
manifest	1.робити очевидним; 2. обнародувати; 3. виявляти
manifestation	прояв
manufacture	виробляти
manufacturing	виробництво, виробничий
master	оволодівати, опановувати
match (<i>n</i>)	рівня, пара
match (<i>v</i>)	підходить (до пари), бути відповідним
mean (meant)	означати, мати на увазі
means (<i>тж. як sg</i>)	засіб, спосіб
measure	вимірювати
measurement	вимірювання
meet world standards	відповідати світовим стандартам
merit	вартість, заслуга, позитивна якість

N

noviciate, novitiate	випробувальний період, учнівство
----------------------	----------------------------------

O

obligatory	обов'язковий
occupation	заняття, фах, рід занять
omit a passage / paragraph	оминати уривок / абзац
opportunity	слухна нагода, сприятлива можливість
outstanding/prominent	видатний

P

paper / work / project	робота, доповідь, проект
course work / paper / project	курсова робота (проект)
graduation paper / project	дипломна робота (проект)
part and parcel	невід'ємна частина
participant	учасник
participate	брати участь
participation	участь
particular	особливий
pay a fee	сплачувати внесок
pay tribute	віддавати належне
perfect (<i>adj</i>)	досконалій
perfect (<i>v</i>)	вдосконалювати
perform	виконувати, здійснювати
performance	виконання, здійснення, робота
poach	переманювати, підбурювати
point of view	точка зору
pollute	забруднювати
pollution	забруднення
portfolio	портфоліо
postgraduate	аспірант
postgraduate course	аспірантура
to take a postgraduate course	вчитись в аспірантурі
postpone	відкладати
preliminary programme	попередня програма
present	представляти
presentation	виступ, представлення
presenter	доповідач
prevent	запобігати
process (<i>v</i>)	обробляти, опрацьовувати, піддавати аналізу
processing	обробка, опрацювання
produce	виробляти
production	виробництво
prolong	продовжувати
promote	сприяти, стимулювати, заохочувати
promotion	сприяння, стимулування, заохочення; просування по службі
prospective	майбутній, очікуваний
prospects (<i>pl</i>)	планы на майбутнє, перспективи
prosper	процвітати
prosperity	процвітання

prosperous	що процвітає, заможний
provide	забезпечувати, надавати
purpose	мета, ціль, призначення
Q	
qualification	кваліфікація
qualified	кваліфікований, компетентний
to qualify	кваліфікувати, оцінювати
quantity	величина, кількість
questionnaire entry	пункт анкети
R	
realm	галузь, сфера, царина
receipt	квитанція
receive	отримувати
recognition	визнання
recognize	визнавати
record (<i>n</i>)	запис
record (<i>v</i>)	записувати
recruit	вербувати, наймати на роботу
reflect	відображати
register	реєструвати,-ся
registration	реєстрація
relate to	мати відношення, стосуватися чогось
related to	пов'язаний з
relation	відношення, зв'язок, залежність
relative	відносний
relatively	відносно
replace	замінити
report (<i>n</i>)	доповідь, повідомлення, звіт
report (<i>v</i>)	доповідати, повідомляти, звітувати
reporter	доповідач, репортер
require	вимагати
requirement	вимога
meet requirements	відповідати вимовам
research	наукове дослідження
1. research associate; 2. research worker	науковий співробітник
research institute	науково-дослідний інститут
research institution	науково-дослідний заклад
research methods	методи дослідження
research project	науково-дослідний проект
research team / group	група дослідників

research work, R & D	науково-дослідна робота
to do research	проводити науково-дослідну роботу
researcher	дослідник, науковий співробітник
respective	відповідний
responsibility	відповідальність, обов'язок
responsible for	відповідальний за
résumé, CV	резюме, біографія
review (<i>n</i>)	огляд, реферат
review(<i>v</i>)	робити огляд
to make a review	робити огляд, готувати реферат
reviewer	оглядач, критик, рецензент, референт
revival	відродження
revive	відроджувати, -ся

S

scale	масштаб (діапазон)
schedule / timetable (<i>n</i>)	розклад
schedule (<i>v</i>)	призначати, включати до розкладу
according to the timetable	за розкладом
science	наука
science and engineering	наука і техніка
scientific	науковий
scientific conference	наукова конференція
scientific school	наукова школа
scientific society	наукове товариство
scientist	вчений
search	пошук
search engine	пошуковий механізм
seek	шукати, намагатися знайти
self-consciousness	самосвідомість
set the task	ставити завдання
simulate	моделювати
simulation	моделювання
skill	майстерність, вміння
skillful	майстерний
society	супільство, товариство
software	програмне забезпечення
solution	вирішення, розв'язання
solve	вирішувати, розв'язувати
source	джерело
speaker	мовець, оратор
state-of-the-art	найсучасніший рівень розвитку технології у певній галузі

submit	подавати на розгляд
success	успіх
successful	успішний
suggest	пропонувати
suggestion	пропозиція
summary	короткий зміст, резюме, анотація
supervise	керувати, наглядати
supervision	керівництво, нагляд
supervisor / scientific adviser	науковий керівник
survival	вижиття
survive	пережити, витримати
swap-shop	секційне обговорення на конференції
synchronous interpretation	синхронний усний переклад

T

take the floor	взяти слово, виступити
technique	техніка, технічні прийоми
threat	загроза
threaten	погрожувати, загрожувати
to be against	бути проти
train	виховувати, навчати, готувати
training	навчання, тренування
transfer (<i>n</i>)	переміщення
transfer (<i>v</i>)	переносити

U

ultimate values	основні, первинні цінності
up-to-date	сучасний

V

value	цінність, важливість, <i>мат.</i> величина
versatile	багатогранний
violate	Порушувати (закон і т. ін.)
violation	порушення
visual aids	уточнення, наочні засоби
vocation	професія
vocational	професійний
voice one's opinion on	висловити свою думку з

W

wander from the subject under debate
wisdom
working language

відхилятися від теми дебатів
мудрість
робоча мова

UKRAINIAN-ENGLISH VOCABULARY

A

анотація, тези доповіді	abstract
апаратне забезпечення	hardware
аспірант	postgraduate
аспірантура	postgraduate course
вчитись в аспірантурі	to take a postgraduate course

B

багатограничний	versatile
базуватися на	be based on
брати участь	participate
бути за	be in favour of
бути залученим	be engaged in
бути присутнім на пленарному засіданні	attend a plenary meeting / session
бути проти	to be against

B

важливий, істотний	essential
вартість, заслуга, позитивна якість	merit
вдосконалювати	perfect (v)
величина, кількість	quantity
вербувати, наймати на роботу	recruit
взяти слово, виступити	take the floor
видати патент	grant a patent
видатний	outstanding/prominent
виживання	survival
вижити	survive
визнавати	recognize
визнання	recognition
визначний, відомий	distinguished
виконання, здійснення, робота	performance
виконувати, здійснювати	perform
виконувати, проводити	carry out (on)
вимагати	require

1.вимагати; 2.претендувати; 3.амер. заявляти, твердити	claim
вимірювання	measurement
вимірювати	measure
вимога	requirement
відповідати вимогам	meet requirements
винахід	invention
винахідливий	inventive
винахідник	inventor
винаходить	invent
випробувальний період, учнівство	noviciate, novitiate
вирішення, розв'язання	solution
вирішувати	decide
вирішувати, розв'язувати	solve
виробляти	manufacture, produce
виробництво	production
виробництво, виробничий	manufacturing
висловити свою думку з	voice one's opinion on
виснаження, вичерпування (запасів)	depletion
висока оцінка, розуміння	appreciation
високо цінувати	appreciate
виступ, представлення	presentation
виховувати, навчати, готувати	train
віддавати належне	pay tribute
відзначати, виділяти, розрізняти	distinguish
відкладати	postpone
відкривати	discover
відкриття	discovery
відносний	relative
відносно	relatively
відношення, зв'язок, залежність	relation
відображати	reflect
відповідальний за	responsible for
відповідальність, обов'язок	responsibility
відповідати світовим стандартам	meet world standards
відповідний	respective
відродження	revival
відроджувати, -ся	revive
відхилятися від теми дебатів	wander from the subject under debate
внесок	contribution
впоратись	cope with
впроваджувати нові перспективні ідеї,	innovate
методи, раціоналізаторські пропозиції	

встановити крайній термін / вкластися в термін / не вкластися в термін establish / meet / miss the deadline for doing something

встановлювати, монтувати install

вступ introduction

вчений scientist

Г

галузь, поле, сфера діяльності field

галузь, сфера, царина realm

головувати chair (*v*)

головуючий, -а chairperson / chairman / chairwoman

грамота, свідоцтво, довідка, сертифікат, посвідка certificate

група дослідників research team / group

Д

дані, інформація data (*pl of datum*)

джерело source

дипломований; той, що має вищу

кваліфікацію certificated

довкілля, оточення, середовище environment

доповідати, повідомляти, звітувати report (*v*)

доловідач presenter

доповідач, репортер reporter

доповідь, повідомлення, звіт report (*n*)

допомагати assist

досвід experience

досвідчений experienced

досконалий perfect (*adj*)

дослідження investigation

фундаментальні дослідження fundamental investigations

проводити дослідження to make / carry out / conduct

досліджувати investigations

дослідник investigator

дослідник, науковий співробітник researcher

дослідницький investigative

досягати achieve

досягнення achievement

дошка оголошень bulletin / notice board

E

екзаменаційна комісія	examination board
ефективний	efficient
ефективність, <i>тех.</i> коефіцієнт корисної дії	efficiency

Ж

жадібність, ненажерливість	greediness
1. жорстокий; 2. болісний, тяжкий	cruel
жорстокість	cruelty

З

1. з'являтися, виходити; 2. виявлятися	emerge
забезпечення роботою, зайнятість, пра- цевлаштування	employment
забезпечувати, гарантувати	ensure
забезпечувати, надавати	provide
заборона	ban (<i>n</i>)
забороняти	ban (<i>v</i>)
забруднення	pollution
забруднювати	pollute
завдавати збитків; пошкоджувати	damage (<i>v</i>)
завірений документ, сертифікований (товар, дипломований (спеціаліст)	certified (document, product, specialist)
завойовувати, підкоряті	conquer
загальна дискусія / дискусія спеціа- лістів	general / panel discussion
загроза	threat
займати посаду	hold a post
заклад, організація, товариство	institution (<i>n</i>)
науково-дослідний заклад	research institution
навчальний заклад	educational institution
засновувати, вводити, започатковувати	institute (<i>v</i>)
законний, правовий	legal
залучення	involvement
замінити	replace
замовчувати	hush up
заняття, фах, рід занять	occupation
заохочення	encouragement
заохочувати	encourage

запис	record (<i>n</i>)
записувати	record (<i>v</i>)
запобігати	prevent
заповнити бланк друкованими літерами	fill in / complete a form in block letters
запрошення	invitation
запрошувати	invite
засіб, спосіб	means (<i>тж. як sg</i>)
1.застосовувати, 2.звертатись до,	
подати заяву	apply
1.застосування, 2.заява	application
захисний	defensive
захисник	defender
захист	defense
захищати	defend
заявити про свої права на щось	claim one's right to
збагачувати	enrich
збільшувати	increase
згідно з, відповідно до	according to / in accordance with
згода, угода	agreement
земляк	countryman
змогти зробити	manage (<i>to do smth.</i>)
зроблений у співпраці, групою людей	collaborative (effort, work, project)
зупинитись на проблемі детальніше	enlarge on a problem

I

інформаційні технології

IT (information technologies)

Ї

їхати у ділове / наукове відрядження

go on a business trip / scientific mission

K

кандидат, претендент

applicant

кваліфікація

qualification

кваліфікований, компетентний

qualified

кваліфікувати, оцінювати

to qualify

квітанція

receipt

керівництво

guidance

під керівництвом

under the guidance

керівництво, нагляд

supervision

керувати

guide

керувати, наглядати

supervise

клієнт, покупець	customer
коментувати	comment on
користь, вигода, прибуток	benefit (<i>n</i>)
короткий зміст, резюме, анотація	summary
крайній термін / строк	deadline
критерій, мірило	criterion (<i>pl - ia</i>)

M

майбутній, очікуваний	prospective
майстер, ремісник	craftsman
майстерний	skillful
майстерність, вміння	skill
масштаб (діапазон)	scale
мати відношення, стосуватися чогось	relate to
мати справу з, бути пов'язаним з	be concerned with, deal with
мета, ціль, призначення	purpose
методи дослідження	research methods
містити в собі, заливати до	involve
містити, покласти у конверт	enclose
місце проведення конференції	location of a conference / venue
мовець, оратор	speaker
моделювання	simulation
моделювати	simulate
мудрість	wisdom

H

набувати (знання, навички, досвід),	acquire
одержувати	
набуття, одержання	acquisition
навушники	earphones
навчання, тренування	training
нагороджувати	award
наймати	employ
найсучасніший рівень розвитку тех.- нології у певній галузі	state-of-the-art
1. наслідок, результат; 2. висновок;	consequence
3. важливість, значення	
настанови	instructions
давати настанови	to give instructions; to instruct
інструктор, викладач (практик)	instructor
наука	science
наука і техніка	science and engineering
наукова конференція	scientific conference

наукова школа	scientific school
наукове дослідження	research
наукове товариство	scientific society
науковий	scientific
науковий керівник	supervisor / scientific adviser
науковий співробітник	1. research associate; 2. research worker
науково-дослідна робота	research work, R & D
проводити науково-дослідну роботу	to do research
науково-дослідний заклад	research institution
науково-дослідний інститут	research institute
науково-дослідний проект	research project
не зуміти / не змогти зробити щось	fail to do something
небезпека	danger
небезпечний, загрозливий	dangerous
невидимий	invisible
невід'ємна частина	1. integral part; 2. part and parcel
нерішучість	indecision

О

об'єм, ємність, потужність, спромог- ність	capacity
обговорювати	discuss
обладнання	equipment
обладнувати, забезпечувати	equip
обмежувати	limit
обмінюватись	exchange
обов'язковий	obligatory
обробка, опрацювання	processing
обробляти, опрацьовувати, піддавати	process (v)
аналізу	
обходиться без	do without
обчислення, підрахунки	calculation
обчислювати	calculate
оволодівати, опановувати	master
огляд, реферат	review (n)
робити огляд	review (v)
робити огляд, готувати реферат	to make a review
оглядач, критик, рецензент, референт	reviewer
оголошення	announcement
оголошення про роботу	classified ad
оголошення, реклама	advertisement / advert / ad
оголошувати	announce

ознайомлювати	acquaint
ознайомитись з	get acquainted with
означати, мати на увазі	mean (meant)
оминути уривок / абзац	omit a passage / paragraph
оперувати, працювати з	handle
організація, домовленість, договір	arrangement
організовувати, упорядковувати	arrange
основи	basics
основні, первинні цінності	ultimate values
особливий	particular
отримувати	receive
отримувати користь	benefit (<i>v</i>)
охоплювати	include
оцінювати	assess

ІІ

переманювати, підбурювати	poach
переміщення	transfer (<i>n</i>)
переносити	transfer (<i>v</i>)
переривати	interrupt
перспективні технології	innovative technologies
підкреслювати, робити наголос	emphasize
підприємство	enterprise
підтвердження, сертифікація	certification
підтверджувати, завіряти, сертифікувати (прилад, товар тощо) ^у	certify
підходить (до пари), бути відповідним	match (<i>v</i>)
планы на майбутнє, перспективи	prospects (<i>pl</i>)
плідний	fruitful
пов'язаний з	related to
повчальний	instructive
погоджуватись з	agree with
погрожувати, загрожувати	threaten
подавати на розгляд	submit
позапрограмна, позааудиторна діяльність	extracurricular activity
полегшувати, сприяти	facilitate
помиллятись	be mistaken
попередня програма	preliminary programme
портфоліо	portfolio
порушення	violation
порушувати (закон і т. ін.)	violate

поточний	current (<i>adj.</i>)
пошук	search
пошуковий механізм	search engine
поява	emergence
працедавець	employer
предмет обговорення, проблема	issue
представляти	present
призначатися, бути призначеним	be intended for
приймати	accept
прилад	device
присвячувати	devote
бути відданим, бути присвяченим	to be devoted to
пристосовувати до	accommodate <i>smth.</i> to
проводити конференцію	hold a conference
програмна діяльність	curricular activity
програмне забезпечення	software
продовжити	prolong
проектувати, планувати	design
пропозиція	suggestion
пропонувати	suggest
професійний	vocational
професія	vocation
процвітання	prosperity
процвітати	prosper
прояв	manifestation
пункт анкети	questionnaire entry

P

раціоналізатор, новатор	innovator
раціоналізаторський, новаторський,	
інноваційний	innovative
реєстрація	registration
реєструвати,-ся	register
резюме, біографія	resume, CV
рекламувати	advertise
рівень	level
рівня, пара	match (<i>n</i>)
рішучість	decisiveness
робити внесок	contribute to
1.робити очевидним; 2.обнародувати;	manifest
3. виявляти	
робота, доповідь, проект	paper / work / project

курсова робота (проект)	course work / paper / project
дипломна робота (проект)	graduation paper / project
робоча мова	working language
роз'яснити свою точку зору	clarify one's point of view
1. розвага; 2. вечірка	entertainment
розвивати, -ся // розробляти	develop
розвиток, розробка	development
роздивлятися	consideration
роздивляти, вважати	consider
роздатковий матеріал	handout
розклад	schedule / timetable (<i>n</i>)
призначати, включати до розкладу	schedule (<i>v</i>)
за розкладом	according to the timetable
розділяти	distribute
розвробник	developer
руйнування, знищення	destruction
руйнувати, знищувати	destroy

C

самосвідомість	self-consciousness
секційне обговорення на конференції	swap-shop
синхронний усний переклад	synchronous interpretation
службовець	employee
слушна нагода, сприятлива можливість	opportunity
совість, сумління	conscience
спадщина	legacy
співробітництво, співпраця	collaboration
співпрацювати	to collaborate
сплачувати внесок	pay a fee
1.справедливість; 2.законність, право-	justice
суддя	
сприяння, стимулювання, заохочення;	promotion
просування по службі	
сприяти, стимулювати, заохочувати	promote
ставити завдання	set the task
створення	creation
стислий, короткий	brief
страхування, забезпечення	insurance
струм	current
судження, думка, погляд	judgement
судити, виносити вирок (рішення)	judge
сумнів	doubt (<i>n</i>)

сумніватися
суперник, конкурент
сусільство, товариство
сучасний

doubt (*v*)
competitor
society
up-to-date

Т

творити, створювати
творчий
творчо
тези доповіді
техніка, технічні прийоми
точка зору

create
creative
creatively
abstract of a paper / report
technique
point of view

У

унаочнення, наочні засоби
усвідомлення, обізнаність, знання
усвідомлювати
успіх
успішний
установка
1. усувати (помилки і т. ін.); 2. зни-
шувати
усунення
учасник
участь
учень
учнівство, навчання професії

visual aids
awareness
be aware of
success
successful
installation
eliminate
elimination
participant
participation
apprentice
apprenticeship

Ц

цінність, важливість, *мат.* величина

value

Ч

чіткий, стислий

concise

ІІІ

широкий, просторий	extensive
шкідливий, згубний	harmful
1.шкода; 2.пошкодження	damage (<i>n</i>)
шукати, намагатися знайти	seek

ІІІ

що процвітає, заможний	prosperous
щорічний	annual
щорічно	annually

CONTENTS

UNIT 1. ENGINEERING PROFESSION	3
SECTION I. AURAL COMPREHENSION	3
SECTION II. USE OF THE ESSENTIAL VOCABULARY	4
SECTION III. APPLIED GRAMMAR	11
SECTION IV. DEVELOPING SPEAKING SKILLS	16
SECTION V. READING AND WRITING	23
SECTION VI. INSTITUTE OF APPLIED MATHEMATICS AND FUNDAMENTAL SCIENCES	29
SECTION VII. INSTITUTE OF COMPUTER TECHNOLOGIES, AUTOMATION AND METROLOGY	39
SECTION VIII. INSTITUTE OF CIVIL AND ENVIRONMENTAL ENGINEERING	46
SECTION IX. HUMANITIES AND SOCIAL SCIENCES INSTITUTE	49
APPENDIX A. KEYS TO THE TASKS	59
APPENDIX B. VERB PATTERNS	60
UNIT 2. LABORATORIES	62
SECTION I. AURAL COMPREHENSION	62
SECTION II. USE OF THE ESSENTIAL VOCABULARY	63
SECTION III. APPLIED GRAMMAR	70
SECTION IV. DEVELOPING SPEAKING SKILLS	77
SECTION V. READING AND WRITING	80
APPENDIX. KEYS TO THE TASKS	85
UNIT 3. UKRAINIAN NAMES IN WORLD SCIENCE.....	86
SECTION I. AURAL COMPREHENSION	86
SECTION II. USE OF THE ESSENTIAL VOCABULARY	87
SECTION III. APPLIED GRAMMAR	93
SECTION IV. DEVELOPING SPEAKING SKILLS	97
SECTION V. READING AND WRITING	101
SECTION VI. EXTENDED READING	107
APPENDIX. KEYS TO THE TASKS	111
UNIT 4. STUDENTS' RESEARCH WORK	114
SECTION I. AURAL COMPREHENSION	114
SECTION II. USE OF THE ESSENTIAL VOCABULARY	117
SECTION III. APPLIED GRAMMAR	128
SECTION IV. DEVELOPING SPEAKING SKILLS	137
SECTION V. READING AND WRITING	143
SECTION VI. EXTENDED READING	154
APPENDIX. KEYS TO THE TASKS	159

UNIT 5. AT A SCIENTIFIC CONFERENCE.....	161
SECTION I. AURAL COMPREHENSION.....	161
SECTION II. USE OF THE ESSENTIAL VOCABULARY.....	163
SECTION III. APPLIED GRAMMAR	171
SECTION IV. DEVELOPING SPEAKING SKILLS	176
SECTION V. READING AND WRITING	184
APPENDIX. KEYS TO THE TASKS	189
UNIT 6. PROFESSIONAL ETHICS	192
SECTION I. AURAL COMPREHENSION.....	192
SECTION II. USE OF THE ESSENTIAL VOCABULARY	194
SECTION III. APPLIED GRAMMAR	203
SECTION IV. DEVELOPING SPEAKING SKILLS	210
SECTION V. READING AND WRITING	215
SECTION VI. EXTENDED READING	224
APPENDIX. KEYS TO THE TASKS	248
ENGLISH-UKRAINIAN VOCABULARY.....	250
UKRAINIAN-ENGLISH VOCABULARY.....	262

Підручник

Getting on in English (intermediate)

Спілкуємося
англійською мовою
(середній рівень)

Видання четверте
(доловнене і розширене)

Здано у видавництво 07.02.2011. Підписано до друку 21.07.2011.

Формат 70×100/16. Папір офсетний. Гарнітура Times.

Друк офсетний. Умовн. друк. арк 22,4. Обл.-вид. арк. 15,2.

Видавництво “Растр-7”
79005, м. Львів, вул. Кн.Романа, 9/1
тел/факс.: (032) 235-52-05, 242-15-49
e-mail: rastr-sim@mail.ru
www.rastr-7.com.ua
Свідоцтво державної реєстрації
ЛВ №22 від 19.11.2002 р.

PAGTO

ISBN 978-966-2004-59-5



9 789662 004595