

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ  
РОССИЙСКОЙ ФЕДЕРАЦИИ  
ГОСУДАРСТВЕННОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ  
ВЫСШЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ  
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# МАТЕРИАЛЫ ДЛЯ РАЗВИТИЯ НАВЫКОВ УСТНОЙ РЕЧИ

*Методические указания  
к лабораторным работам по английскому языку*

САМАРА 2004

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**Материалы для развития навыков устной речи:** Метод. указания к лаб. работам по английскому языку / Самар. гос. аэрокосм. ун-т; Сост. *О.Н. Маринина, Е.Е. Марухина*. Самара, 2004. 43 с.

Данные методические указания состоят из 16 лабораторных работ, которые имеют целью способствовать развитию техники чтения, устных разговорных навыков и навыков аудирования.

Выполнение лабораторной работы является составной частью подготовки студентом домашнего задания. Вся система упражнений направлена на усвоение специальной терминологической лексики, отличается разнообразными типами упражнений. Предусмотрена работа с фонозаписью лабораторных работ.

Организация материала каждой лабораторной работы предусматривает формирование речевых умений и навыков употребления лексических единиц по данной теме до упражнений, подготавливающих студентов к диалогической и монологической речи.

Предназначены для студентов 1 и 2 курсов факультета «Обработка металлов давлением» дневной формы обучения.

Печатаются по решению редакционно-издательского совета государственного образовательного учреждения высшего профессионального образования "Самарский государственный аэрокосмический университет имени академика С.П. Королева"

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## Лабораторная работа № 1

### Самарский государственный аэрокосмический университет

#### I. Прослушайте, повторите и запомните слова:

1. aerospace	аэрокосмический
2. training	обучение
3. related industries	смежные отрасли промышленности
4. founder	основатель
5. faculty	факультет
6. aircraft	самолет, авиация
7. engine	двигатель
8. engineering	техника
9. economics	экономика
10. management	управление
11. simultaneously	одновременно
12. staff	штат сотрудников
13. department	кафедра
14. a yacht club	яхт-клуб
15. a hostel	общежитие
16. facilities	удобства
17. to be engaged	быть вовлеченным в
18. applied	прикладной
19. research and development	исследование и развитие
20. specialization	специализация
21. adherence to	приверженность
22. provide for	обеспечивать
23. bilingual	двуязычный
24. management and marketing	управление и маркетинг

#### II. Прочтите и догадайтесь о значении следующих слов и словосочетаний:

Leading higher education institution; space-rocket construction industry; to be renamed; to include; a catering facility; distinctive feature; adherence to; education through research principle; to take part in; to develop cooperation with; cooperation agreements.

#### III. Прочтите и переведите текст.

### Samara State Aerospace University

Samara State **Aerospace** University (SSAU) is a leading higher education institution for the **training** of engineers for the aviation, space-rocket construction and radio-electronics and other **related industries**. It was established in 1942 as the Kuibyshev Institute of Aviation. In 1966 it was renamed after S.P. Korolyov, the

**founder** of cosmonautics, and in 1992 the institute became Samara State Aerospace University.

There are seven **faculties** at the University: Faculty of Aircraft Construction, Faculty of **Aircraft Engines**, Faculty of Aviation Transport Engineers, Faculty of Plastic Working of Metals, Faculty of **Radio-Engineering**, Faculty of Information Science, College of **Economics and Management**.

About 6000 students are **simultaneously** trained at the University, and its **staff** includes more than 7000 people. The University has 40 **departments**, laboratories, classrooms, computing centres, a well-stocked library, a sports club, a sports centre with a swimming-pool, a summer sports camp, a **yacht** club, a museum of aviation, a museum of aircraft engine history, a fitness and health centre, a catering **facility**, a print facility, seven **hostels** and others.

The University is a large scientific centre, **engaged in** theoretical and **applied research and development**. Now its seven faculties train students in 21 **specializations**. One distinctive feature of the University is **adherence to** the "education-through research" principle. Students have always taken an active part in research efforts. The University's strong scientific traditions and excellent facilities make it a leading institution for both state and regional scientific programmes. As a result of research and development carried out at the University a number of instruments, devices and systems have been developed, made, tested and commercially produced in small quantities.

In 1990 the University began to develop cooperation with foreign partners. Cooperation agreements with foreign universities **provide for** training of **bilingual** specialists. The developments also help develop specialists in **management and marketing**.

The Aerospace University's foreign partners include Oxford Polytechnic (Great Britain), Munich Technical University (Germany), Bradley University and Dowling College (USA) and others.

IV. Задайте к тексту 3 специальных вопроса (1 вопрос к подлежащему), 2 общих вопроса, 1 альтернативный и 1 разделительный вопросы.

V. Дайте английские эквиваленты: ведущее высшее учебное заведение; предприятие; постоянно; специализация; готовить; одновременно; платит сотрудникам; кафедра; общежитие; отличительная черта; верность чему-либо; предоставлять; управление; двуязычный.

VI. Согласитесь или опровергните утверждение. Начиная предложения с фраз: I'm afraid that's wrong; you are quite right/you are not quite right; that's not quite so; I think you are mistaken; as far as I know; I think so/I don't think so; according to the text.

1. SSAU is a leading higher education institution for the training of engineers for the aviation only.
2. It was established in 1942, wasn't it?
3. About 7000 students are simultaneously trained at the University
4. The University is only a large educational centre.

5. Students have always taken an active part in research efforts.
6. The University's seven faculties train students in 15 specializations.
7. The University doesn't have any foreign partners.

VII. Не глядя в текст, дополните предложения.

1. SSAU is ... .
2. ... in 1942.
3. In 1966 ... .
4. There are ... at the University.
5. ... are simultaneously trained at the University.
6. The University is a large scientific centre ... .
7. Students have always taken an active part ... .
8. ... for both state and regional scientific and technological programmes.
9. A number of instruments, devices and systems ... .

## Лабораторная работа № 2

### «С.П. Королев»

- I. Прослушайте и повторите следующие слова и выражения.  
Предложения переведите.

1. designer – конструктор, проектировщик  
S.P. Korolyov is a designer of space – rocket systems.

2. artificial – искусственный

For the first time in the world artificial Earth satellites were designed in the Soviet Union.

3. to launch – запускать

The first Earth satellite was launched in 1957.

4. under the guidance – под руководством

The first spaceships were made under S.P. Korolyov's guidance.

5. acquaintance – знакомство

After acquaintance with Tsiolkovsky's ideas Korolyov became an enthusiast of space-rocketry engineering.

6. jet-propulsion – реактивное движение

7. participation – участие

In 1933 the Group for Studying Jet Propulsion was organized with Korolyov's participation.

8. to devote oneself to – посвятить себя чему-либо

Korolyov devoted himself to developing space-rocketry engineering.

9. to earn – зарабатывать, заслуживать

His work earned him their gratitude.

10. to award – награждать

She was awarded the title of Hero of Socialist Labour.

- II. Прочтите и догадайтесь о значении следующих слов:

System, sphere, cosmic, academician, aero-mechanical, group, hero, prize, bureau, enthusiast, experimental, talent, organizer, ideas, spirit, satellite, industry, title, order.

- III. Переведите производные:

designer – to design – design

participation – to participate – participant

acquaintance – to acquaint

founder – foundation – to found

scientist – science – scientific

- IV. Подберите эквиваленты:

1. designer

1. под его руководством

2. artificial

2. познакомить

3. to launch

3. реактивное движение

4. spaceship

4. посвятить

5. under his guidance

5. конструктор

6. to acquaint

6. искусственный

7. to devote

7. запускать

8. awards
9. participation
10. gratitude
11. jet propulsion

8. участие
9. благодарность
10. космический корабль
11. награды

V. Подберите синонимы:

1. to design
2. to launch
3. to participate
4. to devote oneself to...
5. to award
6. artificial
7. to get acquainted with somebody
8. outstanding

1. to take part
2. to meet somebody
3. to construct
4. to start
5. famous
6. to give oneself to
7. man – made
8. to reward

VI. Прослушайте и переведите текст:

### SERGEI KOROLYOV

Academician Sergei Korolyov was an outstanding Soviet scientist and designer of space-rocket systems. The first artificial Earth satellites and spaceships in which man made his first cosmic flights were made under S.P. Korolyov's guidance.

Korolyov was born on January, 12 1907, in the city of Zhitomir into the family of a teacher. From 1927 he worked in the Aircraft industry. In 1930, without leaving his job, he graduated from the aeromechanic department of the Moscow Bauman Higher Technical School and finished a flyer's school the same year.

After acquaintance with Konstantin Tsiolkovsky and his ideas Korolyov became an enthusiast and one of the founders of space-rocketry engineering.

In 1933 the Group for Studying Jet Propulsion was organized with his participation, and they made the first experimental rockets.

From then on he devoted himself entirely to developing Soviet space-rocketry engineering.

Korolyov reared many leading scientists and engineers who are now working in research and design bureaus in the sphere of space-rocketry engineering.

S.P. Korolyov was a talented research worker, a brilliant organizer and a man of high spiritual qualities. From 1967 our institute was named after academician S.P. Korolyov.

Sergey Korolyov's fruitful work earned him the gratitude of the Soviet people and he received high government awards. He was twice awarded the title of Hero of Socialist Labour, and received the Lenin Prize, and Orders and Medals of the Soviet Union.

VII. Закончите предложения:

1. The first artificial Earth satellites and spaceships ...
2. After acquaintance with Konstantin Tsiolkovsky ...

3. In 1930 without leaving his job ...
4. In 1933 the Group for Studying Jet Propulsion was organized ...
5. Sergei Korolyov's fruitful work earned him the gratitude ...
6. He was twice awarded the title of ...
7. Korolyov reared leading scientists ...
8. S.P. Korolyov was a talented research worker ...

VIII. Составьте словосочетания из данных слов, переведите:

Model: problems – complex problems

organizer, scientist, fruitful, satellites, research, design, work, worker, spiritual, brilliant, outstanding, bureaus, qualities, artificial.

IX. Ответьте на вопросы:

1. What sphere did Korolyov work in?
2. What was made under his guidance?
3. When and where was Korolyov born?
4. Where was Korolyov educated?
5. Why did he become an enthusiast of space-rocketry engineering?
6. What was the beginning of Korolyov's work in space-rocketry engineering?
7. What government awards did he receive?
8. Whom were many leading scientists and engineers reared by?
9. What can you say about Korolyov's personality?

X. Расскажите по-английски о С.П. Королёве.



Россия

I. Прослушайте, повторите и запомните слова:

- |                                   |   |
|-----------------------------------|---|
| 1. vast territory                 | - обширная территория                     |
| 2. to lie                         | - лежать, находиться                      |
| 3. to be washed by                | - омываться                               |
| 4. to border on                   | - граничить с                             |
| 5. to vary from smth. to smth.    | - изменяться от чего-либо до чего-либо    |
| 6. a desert                       | - пустыня                                 |
| 7. a valley                       | - долина                                  |
| 8. a mountain chain               | - горная цепь                             |
| 9. to be rich in                  | - быть богатым чем-либо                   |
| 10. natural and mineral resources | - природные ресурсы и полезные ископаемые |
| 11. a deposit of smth.            | - месторождение чего-либо                 |
| 12. the current population        | - население в настоящий момент            |
| 13. a parliamentary republic      | - парламентская республика                |
| 14. Head of State                 | - глава государства                       |
| 15. a branch                      | - власть (как часть правительства)        |
| 16. legislative                   | - законодательный                         |
| 17. executive                     | - исполнительный                          |
| 18. judicial                      | - судебный                                |
| 19. to be exercised by            | - осуществляться (кем-либо, чем-либо)     |
| 20. the Federal Assembly          | - Федеральное собрание                    |
| 21. a chamber                     | - палата                                  |
| 22. the Council of Federation     | - Совет Федерации                         |
| 23. the State Duma                | - Государственная Дума                    |
| 24. to be headed by               | - возглавляться кем-либо                  |
| 25. to be elected by              | - избираться кем-либо                     |
| 26. the Cabinet of Ministers      | - кабинет министров                       |
| 27. a system of courts            | - система судов                           |
| 28. the Constitutional Court      | - Конституционный суд                     |
| 29. the Supreme Court             | - Верховный суд                           |

II. Прочтите и переведите текст.

Russia

The **vast territory** of Russia **lies** in the eastern part of Europe and the northern part of Asia. Russia **is washed by** twelve seas and three oceans. The oceans are: the Arctic, the Atlantic, the Pacific. The seas are: the White Sea, The Black Sea, the Baltic Sea and others.

Russia **borders on** many countries, such as Mongolia and China in the south-east, Finland and Norway in the north-west and so on.

The land of Russia **varies** very much **from** forests **to** deserts, from high mountains to deep **valleys**. The main **mountain chains** are the Urals, the Caucasus and the Altai. There are a lot of great rivers and deep lakes on its territory. The longest rivers are the Volga in Europe and the Ob, the Yenisei and the Lena in Asia. The largest lakes are Ladoga and Baikal.

The Russian Federation is **rich in natural and mineral resources**. It has **deposits of** gas, oil, coal, iron, gold and many others.

The **current population** of Russia is more than 150 million people.

Russia is a **parliamentary republic**. Head of the State in this country is the President. The government consists of three **branches: legislative, executive and judicial**. The **President** controls each of them.

The legislative power is **exercised by the Federal Assembly**. It consists of two **chambers: The Council of Federation and The State Duma**. Each chamber is **headed by the Speaker**. The members of the Federal Assembly **are elected** by the people for four years.

The executive power belongs to the Government, or **the Cabinet of Ministers**. The government is headed by the Prime Minister.

The judicial power belongs to the **system of courts**. It consists of **the Constitutional Court, the Supreme Court** and other courts.

The national symbol of Russia is a white-blue-and-red banner.

### III. Ответьте на вопросы:

1. Where does the vast territory of Russia lie?
2. What mineral resources are there in Russia?
3. What is the form of government in Russia and who is it headed by?
4. What is the national symbol of Russia?

### IV. Подберите из «B» подходящие по смыслу слова к «A»:

#### A:

1. presidential
2. vast
3. supreme
4. federal
5. mountain
6. national
7. legislative

#### B:

- a) assembly
- b) court
- c) symbol
- d) chains
- e) power
- f) territory
- g) republic

V. Переведите производные:

to vary - variety - various - variable - varied

nature - natural - naturally

to elect - election - elective - elector — electoral

VI. Дайте английские эквиваленты: обширная территория; омываться чем-либо; граничить с; меняться; пустыня; долина; горная цепь; глубокие озера; быть богатым чем-то; минеральные ресурсы; месторождения; парламентская республика, состоять из; Совет Федерации; избираться; возглавляться кем-либо.

VII. Переведите на английский язык:

- а) Байкал - самое большое и глубокое озеро в мире.
- б) На обширной территории России много лесов, высоких горных цепей, долин, рек и озер.
  - с) Едва ли есть какая-нибудь другая страна в мире, которая так богата природными ресурсами и полезными ископаемыми.
  - d) Президент является главой государства.
  - е) Законопроект (a bill) должен быть одобрен (to approve) и подписан (to sign) президентом.

## Moscow is the capital of Russia

### I. Прочтите и запомните следующие слова:

1. a capital	- столица
2. a frontier post	- пограничный пост
3. to connect	- соединять
4. a yoke	- иго
5. to become	- становиться
6. to rebuild	- перестраивать, реконструировать
7. wealthy	- богатый
8. to occupy	- занимать
9. to retreat	- уходить, отступать
10. famous	- известный
11. a scientific centre	- научный центр
12. to desire	- желать

### I. Прослушайте и прочтите текст:

Moscow is the capital of Russia. It was founded in 1147. At that time it was a small frontier post. The history of Moscow is connected with the history of Russia. In 1237 Moscow fell under the yoke of the Tatars. And it was Dmitry Donskoy who led the Russian troops to a victory over the invaders in the battle of Kulikovo field in 1380.

By the 15<sup>th</sup> century Moscow turned into a wealthy city. It was under Ivan III that Moscow became the capital of the state of Moscovy. At that time the Kremlin was rebuilt.

During the Troubled times Moscow was occupied by the Polish invaders, but they were routed by the popular levy headed by Minin and Pozharsky.

In the 1812 the Napoleonic army entered Moscow. The city was set ablaze and the army had to retreat. Nowadays Moscow is the largest city of Russia. It is a political, economic, educational and cultural centre of the country.

There are many places of interest in Moscow. The city is famous for its historical monuments, museums, art galleries and theatres. The historical Museum, the Pushkin Museum of Fine Arts, the Tretyakov State Picture Gallery are world famous.

Moscow is proud of the Bolshoi, Maly and Art theatres. Moscow is an industrial centre with highly developed engineering, electric, light and chemical industries.

Moscow is a scientific centre too. The Russian Academy of Sciences, the oldest university, many schools, colleges and scientific institutions are located here.

Moscow is the country's largest sports centre. It often becomes a scene of international sports festivals.

### III. Найдите в тексте предложения, содержащие информацию:

1. О дате основания Москвы.
2. Что произошло в 1380 году?
3. Когда был восстановлен Кремль?

4. Какое событие произошло в 1812 году?
5. Чем является Москва в наши дни?

IV. Вставьте в предложения слова, данные под чертой:

1. Moscow is ... of Russia.
2. In 1237 Moscow fell under ... of Tatars.
3. During the Troubled Times Moscow ... by the Polish invaders.
4. There are many ... in Moscow.
5. Moscow ... of the Bolshoi, Maly and Art theatres.
6. Moscow is an industrial centre with ... engineering, electric, light and chemical industries.

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places of interest; was occupied; is proud; the capital; highly developed; the yoke

V. Исправьте утверждение, если оно не соответствует данному в тексте:

1. Moscow was founded in 1347.
2. By the 19<sup>th</sup> century Moscow turned into a wealthy city.
3. In 1218 the Napoleonic army entered Moscow.
4. Nowadays Moscow is the smallest city of Russia.

VI. Ответьте на вопросы:

1. When was Moscow founded?
2. What was Moscow at that time?
3. Who headed the liberation movement in the 14<sup>th</sup> century?
4. When did Moscow become the capital of Russia?
5. What happened to Moscow in 1812?
6. What is Moscow now?
7. What places of interest in Moscow do you know?
8. Have you ever been to Moscow?

VII. Расскажите о Москве по-английски.

## Великобритания

I. Прослушайте, повторите и запомните слова:

political unity - политическое единство  
decline - упадок, спад  
chalk and limestone hills - меловые и известняковые холмы  
major - основной, главный  
to rely upon imports - полагаться на импорт  
raw materials - сырье  
to be responsible for - быть ответственным  
to submit to - представлять на рассмотрение  
the party in power - правящая партия  
the party out of power - оппозиционная партия  
to supplant - вытеснить, занять место  
to elect - выбирать  
to appoint - назначать  
hereditary - наследственный  
consumer goods - потребительские товары  
duration - срок, продолжительность  
national affairs - внутренние дела

II. Прочтите и догадайтесь о значении следующих слов:

the United Kingdom, Northern Ireland, England, Wales, population, port, industry, export, import, textile, product, monarchy, parliament, leader, to criticize, motor vehicles, civil, military aircraft, helicopters.

III. Прочтите и переведите текст.

### Great Britain

The United Kingdom of Great Britain and Northern Ireland is the **political unity** of England, Scotland, Wales, Northern Ireland. It is one of the most powerful countries in the world.

In mid-1990 the population of Britain was about 58,8 million people and its territory is 245 thousand square kilometers.

In geographical descriptions, Britain is usually divided into two **major** regions: Highland Britain and Lowland Britain. Highland Britain includes Scotland, Lake District, almost the whole of Wales and the **counties** of Devon and Cornwall. Lowland Britain is a rich plain with **chalk and limestone hills**.

The largest cities of Great Britain are: London, Birmingham, Glasgow, Liverpool, Bristol and Cardiff.

Britain's major industries include iron and steel, engineering, including motor vehicles and aircraft, textiles and chemicals. As a result of this Britain's main exports are: manufactured goods such as machinery, vehicles, aircraft, metal manufactures, electrical apparatus. Britain's aerospace industry is well known for producing civil and military aircraft, helicopters and space vehicles. However, it should be remembered that Britain relies heavily upon imports of metal and ores, textile raw materials and many other products.

Great Britain is a monarchy, but the power of the Queen is not absolute, but constitutional. The power of the Queen is **hereditary**, and not **elective**. Her powers are limited by Parliament. Parliament consists of two Houses: the House of Commons and the House of Lords. Parliament has a maximum **duration** of five years. The House of Lords is hereditary. The House of Commons is elected and consists of 635 Members of Parliament. The leader of the party that has majority in the House of Commons becomes the Prime Minister of Great Britain. The Prime Minister is appointed by the Queen and all other ministers of the Government are **appointed** on the recommendation of the Prime Minister. He is the virtual ruler of the country, **responsible** for every measure **submitted** to Parliament. Opposition is the name given in British politics to the **party out of power** whose aim is to criticize and, if possible, **supplant the party in power**.

Among the political parties we can mention the Conservative Party, the Labour Party, the Communist Party and the recently formed Social Democratic Party.

IV. Задайте к тексту письменно 3 специальных вопроса, 2 общих вопроса, 1 альтернативный и 1 разделительный вопросы.

V. Найдите в тексте английские эквиваленты русских словосочетаний:

одна из наиболее развитых стран в мире, в географических описаниях, равнина с меловыми и известняковыми холмами, основные отрасли промышленности, следует помнить, сильно зависит от импорта, сырье для текстильной промышленности, вытеснить правящую партию, наследственная власть, палата общин, палата лордов.

VI. Переведите производные:

politics -politician-political  
produce-product-production  
constitute-constitution- constitutional  
major-majority  
lead-leader  
rule-ruler-ruling  
power-powerful  
response-responsible-responsibility

VII. Вставьте пропущенные слова:

1. Counties ..... London are mainly industrial.

2. Newer industries ..... vehicle manufacture, aircraft building, manufacture of a ..... consumer goods,
  3. Engineering remains a ..... industry in Scotland.
  4. Parliament ..... two Houses.
  5. The House of Commons is .....
  6. The Government is the body of ministers ..... the administration of national affairs.
- 

include, responsible for, wide range of, major, elected, surrounding, consists of.

VIII. Согласитесь или опровергните утверждение. Начинайте предложения с фраз:

I'm afraid that's wrong; you are quite right/ you are not quite right; that's not quite so; I think you are mistaken; as far as I know; I think so/ I don't think so; according to the text.

1. Great Britain is the most powerful country in the world.
2. England comprises Wales, Scotland and Northern Ireland.
3. England is a highland Country.
4. The largest cities of Great Britain are Glasgow, Bombay, Columbus and Dallas.
5. Great Britain exports metal and ores, textile raw materials.
6. Great Britain is an absolute monarchy.
7. Opposition is the party out of power, whose aim is to criticize the Government.

IX. Не глядя в текст, закончите предложения:

1. Britain's major industries include ... .
2. Britain relies heavily upon ... .
3. Great Britain is a monarchy, but ... .
4. The Prime Minister is the leader of ... .
5. Parliament consists of ... .

X. Переведите на английский язык.

1. Великобритания – высокоразвитая индустриальная страна, крупный поставщик промышленной продукции и экспортер капитала.
2. Старейшая отрасль английской промышленности – текстильная – утратила прежнее значение.
3. Консервативная партия, крупнейшая политическая партия, образована в 1867 году и насчитывает 3 млн. человек.
4. Лейбористская партия основана в 1900 году. Эта партия насчитывает более 6 млн. человек.

XI. Расскажите по-английски тему «Great Britain».



London

I. Прочтите и переведите слова:

1. to found – основывать
2. abandon – покидать
3. Edward the Confessor – Эдуард Исповедник, король Англии (1042-1066)
4. importance – важность, значимость
5. to elect – избирать
6. to rebuilt – восстанавливать
7. medieval – средневековый
8. to replace – заменять
9. to destroy – уничтожать
10. to associate – связывать
11. inattractive – непривлекательный

II. Прослушайте и прочтите текст «London»:

London was founded in the first century A.D. by the Romans. They left London in the 5<sup>th</sup> century and the city was largely abandoned. By the 8<sup>th</sup> century London was again a busy trading centre, and in the 11<sup>th</sup> century it became the capital of England. Edward the Confessor built a palace and an abbey of Westminster.

Medieval London grew in importance as a trading centre and in 1215 its citizens won the right to elect their own leader or lord of Mayor.

The Great Fire of 1666 destroyed three-quarters of the city. Sir Christopher Wren rebuilt and designed 51 churches. The rebuilding of London followed the medieval street plan, but the old wooden houses were replaced by buildings of brick to reduce the future fire risk.

In 19<sup>th</sup> century the new forms of transport were developed, including the underground railway system.

Large areas of London were destroyed by bombs during World War II.

Today Greater London covers 625 square miles and consists of 33 separate boroughs, including the City, the West End, the East End and houses 7 million people.

The City is the heart of London. It is the financial centre of the UK with many banks, offices and the stock Exchange.

All the historical places and famous parks are in the West End. In the West End there are Houses of Parliament, Westminster Abbey, Buckingham Palace. The best known streets are: Whitehall with important Government offices, Downing Street, the residence of the Prime Minister and Fleet Street, which stands for the press.

The name “West End” is associated with wealth, luxury and goods of high quality.

The port of London is in the East End. It is an area of docks, inattractive in appearance, but very important in the country's commerce.

III. Найдите в тексте предложения, содержащие информацию:

1. о дате основания Лондона
2. когда Лондон стал столицей Англии
3. о пожаре в 1666 году
4. как развивался Лондон в 19 веке
5. какой вклад в развитие города внёс Кристофер Рен
6. об известных исторических достопримечательностях Лондона

IV. Исправьте утверждения, если они неверны:

1. Edward the Confessor built a palace and abbey of Westminster.
2. The Great Fire of 1765 destroyed three-quarters of the city.
3. The rebuilding of London followed the modern street plan.
4. Large areas of London were destroyed by bombs during World War II.
5. All the historical places and parks are in the East End.
6. In the West end there are Houses of Parliament, Westminster Abbey, Buckingham Palace.
7. The name "East End" is associated with wealth, luxury and goods of high quality.

V. Ответьте на вопросы:

1. When was London founded?
2. What were the most important events in the history of London?
3. What is implied under Greater London?
4. What is the West End famous for?
5. What is the City noted for?
6. What is there in the East End?

VI. Расскажите по-английски о Лондоне.

I. Прочтите и переведите текст:

**Metals**

Metals are materials most widely used in industry because of their properties. The study of the production and properties of metals is known as metallurgy.

Metals are malleable (can be deformed and bent without fracture) and ductile (can be drawn into wire). Metals vary greatly in their properties.

The regular arrangement of atoms in metals gives them a crystalline structure. Irregular crystals are called grains. The properties of the metals depend on the size, shape, orientation and composition of these grains. In general, a metal with small grains will be harder and stronger than one with coarse grains.

Heat treatment such as quenching, tempering, or annealing controls the nature of the grains and their size in the metal.

Small amounts of other metals (less than 1 per cent) are often added to a pure metal. This is called alloying and it changes the grain structure and properties of metals.

Metals are subjected to metal fatigue and to creep (the slow increase in length under stress) causing deformation and failure.

The ways of working a metal depend on its properties. Many metals can be melted and cast in moulds, but special conditions are required for metals that react with air.

II. Постарайтесь выучить следующие слова:

a property – свойство (properties – мн. ч.)

metallurgy – металлургия

malleable – ловкий, податливый, способный деформироваться

bend (bent, bent) – гнуть

ductile – эластичный, ловкий

to draw (drew, drawn) – волочить, тянуть

wire – проволока

to depend on – зависеть

size – размер

shape – форма

composition – состав

coarse – грубый

heat treatment – тепловая обработка

quenching – закалка

tempering – отжиг, отпуск

amount – количество, величина

pure – чистый, беспримесный

fatigue – усталость

failure – повреждение, разрушение

to melt – плавить

to cast – отливать

mould – литейная форма

III. Найдите эквиваленты следующих слов и словосочетаний в тексте:

1. свойства металлов
2. кристаллическая структура
3. размер зерен
4. форма зерен
5. закалка
6. отжиг
7. волочение
8. горячая обработка
9. усталость металла
10. ползучесть металла
11. способы обработки металлов

IV. Ответьте на следующие вопросы:

1. What are metals?
2. What do we call metallurgy?
3. Are metals malleable?
4. What is alloying?
5. What do the properties of metals depend on?
6. How can metals be worked?
7. What is creeping?

V. Объясните по-английски значение следующих слов:

1. malleability
2. crystalline structure
3. grains
4. heat treatment
5. alloying
6. creep

VI. Переведите на английский язык:

1. Металлы имеют кристаллическую структуру из-за правильного расположения атомов.
2. Чем меньше зерна, тем тверже металл.
3. Закалка и отжиг изменяют структуру зерен и свойства металла.
4. Легирование изменяет структуру зерен и свойства металлов.
5. Металл деформируется и разрушается из-за усталости и ползучести.

Non-Ferrous Metals

I. Прослушайте слова и словосочетания. Предложения переведите.

1. brittle – хрупкий

There are some non-ferrous metals which are hard but brittle.

2. to reduce – уменьшать

It is known that very much carbon in steel reduces its strength therefore carbon present is confined to certain limits.

3. metallic appearance – металлический блеск

White iron has a white metallic appearance.

4. to machine – обрабатывать, подвергать механической обработке

Malleable iron is the most easily machined of all ferrous alloys.

5. castings – отливка, литьё

Malleable iron castings are much stronger than gray iron castings.

6. to stand – выдерживать

Great shock will not be stood by gray iron.

7. to compose – составлять

Ferrous metals are composed of iron, carbon and many other elements.

8. manganese – марганец

Manganese is used almost entirely as an alloy.

9. sulphur – сера

The alloy of gray castings is composed of iron, carbon, manganese, sulphur and other elements.

10. grade of castings – сорт отливок

We were shown different grades of castings.

II. Прочитайте и переведите следующие слова и словосочетания:

such as, other metals, are classed as non-ferrous metals, very high electric conductivity, corrosion-resistant qualities, electrical contacts, in the pure form, as sheet zinc, light in weight, an alloying element, the above-mentioned non-ferrous metals, in various proportions, aluminium alloys.

III. Подберите эквиваленты:

1. non-ferrous

1. твёрдый

2. metal castings

2. качества

3. copper

3. свинец

4. lead

4. медь

5. hard

5. металлические отливки

6. above-mentioned

6. цветной

7. qualities

7. вышеупомянутый

IV. Переведите следующие предложения:

1. Non-ferrous metals are more expensive than ferrous ones.
2. It is light in weight, has high corrosion – resistant qualities.
3. Its strength is so low that it must be supported by a core (стержень) of some other metals.
4. Aluminium is employed as an alloying element.
5. The above-mentioned metals may be mixed in various proportions to form many alloys.
6. Zinc is employed in the pure form as sheet zinc.

V. Переведите производные:

- red – reddish  
silver – silvery  
melt – melting (point)  
grade – gradual  
concentrate – concentration  
characteristic – characterize

VI. Подберите антонимы:

- |                         |                            |
|-------------------------|----------------------------|
| 1. expensive            | 1. cheap                   |
| 2. separate             | 2. soft                    |
| 3. a limited proportion | 3. deform                  |
| 4. hard                 | 4. harden                  |
| 5. melt                 | 5. an unlimited proportion |
| 6. form                 | 6. combine                 |

VII. Прослушайте и прочитайте текст.

### Non-Ferrous Metals

Some non-ferrous metals do not contain iron, such as copper, nickel and tin. Other metals and alloys in which iron may be present but not in a principal or calculated proportion are also classed as non-ferrous.

Non-ferrous metals are more expensive than ferrous ones. The metals most frequently used to make non-ferrous metal casting are copper, tin, zinc, lead, nickel, gold and aluminium.

Copper is a reddish-brown, tough (вязкий) metal. It has very high electric conductivity and high corrosion-resistant (коррозиустойчивый) qualities. Copper is used for making electrical contacts and wires, pipes, telephone cables, etc. Zinc is a hard brittle, bluish-white metal that is employed in the pure form as sheet zinc.

Lead is a heavy bluish-gray metal which is very soft. This metal is highly resistant to corrosion, but its strength is so low that it must be supported by a core of some other metals. Lead is used for lining pipes, acid tanks, etc.

Aluminium is a soft silvery white metal. It is light in weight, has high corrosion-resistant qualities and is used for automobile and airplane parts as well as for making different light-weight objects – frames, chairs, etc.

Tin is a silvery, corrosion-resistant metal. It is hardly used in pure form, but is employed as an alloying element.

Nickel is a hard silvery metal. It has high corrosion-resistant qualities and is used for plating iron, steel, brass, and other base metals.

The above-mentioned non-ferrous metals may be mixed in various proportions to form many alloys, chief among them being brasses, bronzes, aluminium alloys.

VIII. Закончите предложения:

1. Non-ferrous metals are more...
2. Copper is a reddish-brown, tough...
3. Lead is used for...
4. Tin is a silvery...
5. The above-mentioned non-ferrous metals may be mixed in...

IX. Вставьте пропущенные слова:

1. Some non-ferrous metals ... iron, such as copper, nickel and tin.
2. Zinc is a hard, brittle, bluish white metal that ... .. in a pure form as sheet zinc.
3. Aluminium is used for ... ..
4. Bronze is ... containing primarily copper and tin.
5. The aluminium predominates in ... ..
6. The most important of all alloy series is ... ..

---

is employed, aluminium alloys, do not contain; the iron-carbon series, an alloy; automobile and airplane parts.

X. Ответьте на вопросы:

1. Is copper a reddish-brown tough metal?
2. Does it have high corrosion-resistant qualities?
3. Are non-ferrous metals more expensive than ferrous ones?
4. What do you know about nickel?
5. Where is nickel used?

## Ferrous Metals

I. Прослушайте слова и словосочетания. Предложения переведите.

1. conductivity – проводимость  
High conductivity is a well known property of metals.
2. density – плотность  
High density is one of the properties of metals.
3. strength – прочность  
This metal has great strength.
4. malleability – ковкость  
The results of the experiment showed that most metals possessed malleability.
5. ductility – тягучесть  
Ductility is also known as one of the properties of metals.
6. ferrous – железистый, черный  
Ferrous metals are widely used – in the machine building industry.
7. iron – железо, чугун  
Ferrous metals consist of iron and many other elements.
8. cast iron – чугун, чугунная отливка  
Steel and cast iron are two forms of ferrous metals which are widely used in industry.
9. pig iron – чугун в чушках  
Many experiments have been conducted to improve the quality (качество) of pigs produced from pig iron.
10. blast-furnace – доменная печь
11. carbon – углерод  
Carbon and iron are the most important of all elements in ferrous metals.

II. Подберите эквиваленты:

- |                   |                   |
|-------------------|-------------------|
| 1. ferrous metals | 1. проводимость   |
| 2. strength       | 2. черные металлы |
| 3. ductility      | 3. чугун в чушках |
| 4. iron           | 4. сталь          |
| 5. pig iron       | 5. плотность      |
| 6. steel          | 6. чугун          |
| 7. density        | 7. тягучесть      |
| 8. conductivity   | 8. прочность      |

III. Переведите следующие предложения:

1. Ferrous metals consist of iron combined with carbon, silicon, phosphorous and other elements.
2. Most metals possess high density, strength, malleability, ductility.
3. Grey iron can be cast into almost any shape and size.
4. Cast iron contains a higher percentage of carbon.
5. Steel is iron with a very little carbon content.



6. It is difficult to machine it because most of the carbon present is in the chemical combination with the iron.

IV. Переведите производные:

to conduct – conductor – conductivity

malleable – malleability

importance – important

to use – used – usage – using

to differ – different – difference

to produce – producer – production – product

to reduce – reduction

to combine – combination

V. Подберите антонимы:

1. high

1. little

2. great

2. easy

3. ferrous

3. non-ferrous

4. strong

4. small

5. difficult

5. weak

6. much

6. low

VI. Прочитайте и переведите текст.

### Ferrous Metals

Metals are characterised by high conductivity. Most metals possess high density, strength, malleability and ductility.

There are two groups of metals: ferrous metals and non-ferrous metals.

Ferrous metals consist of iron combined with carbon, silicon, phosphorous and other elements. Carbon is the most important of all elements present in ferrous metals. Ferrous metals are now being used in industry in two general forms: steel and cast iron, which differ in the quantity of carbon. These two ferrous alloys are derived from pig iron which is produced in a blast-furnace in the form of pigs.

Steel is iron with a very little carbon content (to 1.7 – 2 per cent) which makes it much stronger than iron and is therefore widely used in machine-building. But very much carbon makes steel brittle, which reduces its strength.

Cast iron contains a higher percentage of carbon (more than 2 per cent). It is the cheapest of all the engineering metals. Cast iron is divided into two classes: white iron and gray iron. When all the carbon in cast iron is in the combined form, the metal, has a white metallic appearance.

It is therefore called white iron. It is difficult to machine it because most of the carbon present is in the chemical combination with the iron.

Gray iron can be cast into almost any shape and size. The alloy of gray castings is composed of iron, carbon, silicon, phosphorous, manganese and sulphur. These elements are used in different proportions depending on the grade of castings.

VII. Прочитайте текст «Ferrous Metals» внимательно и найдите английские эквиваленты следующих словосочетаний:

1. Черные металлы. 2. Высокая проводимость. 3. Количество содержания углерода. 4. Чугун в чушках. 5. Доменная печь. 6. Высокий процент. 7. Состав. 8. Серый чугун. 9. Белый чугун. 10. Ковкий чугун. 11. Сорт отливки.

VIII. Найдите в тексте «Ferrous Metals» эквиваленты следующих русских предложений:

1. Большинство металлов обладают высокой плотностью, прочностью, ковкостью и тягучестью.
2. Существуют две группы металлов: черные и цветные металлы.
3. Углерод – самый важный из всех элементов, присутствующих в черных металлах.
4. Эти два железистых сплава получают из чугуна в чушках, который производится в доменной печи в виде чушек.
5. Литейный чугун содержит большой процент углерода.
6. Сталь – это чугун с очень малым содержанием углерода, что делает ее гораздо крепче, чем чугун.
7. Литейный чугун – самый дешевый из всех технических металлов.
8. Серый чугун можно отливать в отливки любой формы и размера.

IX. Ответьте на следующие вопросы:

1. What are metals characterised by?
2. Do most metals possess density, malleability and ductility?
3. What is the most important of all elements present in ferrous metals?
4. What does steel differ from cast iron in?
5. What is carbon content in steel?
6. What is carbon content in cast iron?
7. What classes is cast iron divided into?

X. Составьте план текста “Ferrous metals” и постарайтесь пересказать его в соответствии с планом.

## Forging

I. Прочтите и постарайтесь запомнить следующие слова. Предложения переведите.

1. Forging – ковка  
Forging is one of the most important processes in machine-building industry.
2. calculate – вычислять, подсчитывать  
We calculated the day on which the holiday of metallurgists will fall.
3. subject – подвергать (воздействию, влиянию)  
A lot of non-ferrous metals are subjected to forging.
4. stamping – штамповка  
What can you say about stamping?
5. widespread – широко распространенный  
Copper is a widespread metal.
6. produce – получать, производить, создавать  
Some parts to this machine were produced by casting.
7. extremely – чрезвычайно, крайне  
Forging is an extremely important process in modern industry.
8. smelt – плавить, выплавлять  
We were invited to see how steel was smelted.
9. consume – потреблять, расходовать  
Forged components consume much less metal than machined ones.
10. improve – улучшать, совершенствовать  
They saw that after forging the quality of steel had improved.
11. cost – стоить, стоимость  
How much does this forged part cost?
12. Hammer forging – поковка из под молота  
Hammer forging is often used in automobile industry.

II. Подберите синонимы:

- |                 |                   |
|-----------------|-------------------|
| 1. to calculate | 1. detail         |
| 2. widespread   | 2. to manufacture |
| 3. to produce   | 3. to count       |
| 4. part         | 4. well-known     |

III. Подберите эквиваленты:

- |                 |                        |
|-----------------|------------------------|
| 1. to calculate | плавить                |
| 2. extremely    | стоить                 |
| 3. to consume   | улучшать               |
| 4. to produce   | подвергать воздействию |
| 5. stamping     | ковка                  |
| 6. forging      | производить            |
| 7. to subject   | ковка                  |

8. to improve	потреблять, расходовать
9. to cost	чрезвычайно
10. to smelt	вычислять, подсчитывать

IV. Переведите следующие предложения на русский язык:

1. Forging is a very important process for machine-building industry.
2. Forging improves the quality of steel.
3. Hammer forging and stamping are widespread in many industries.
4. No machine can be built without the use of forging.
5. One-third of all steel smelted in our country is subjected to forging and stamping.

V. Прослушайте и прочтите текст.

### Forging

Forging processes are extremely important in the machine-building industry. No machine can be built without the use of forging. It has been calculated that in Russia from 15 to 20 per cent of all the materials produced are subjected to forging; and that one-third of all steel smelted in our country is subjected to forging and stamping. Hammer forging and stamping are particularly widespread in the tractor, automobile, agricultural machinery, ship-building, locomotive-building and other industries.

The widespread use of forging is explained by the fact that forging improves the quality of steel; after forging steel becomes stronger. For this reason, machine parts are generally made of forgings. The time required for the manufacture of a part is very often reduced by forging, much less steel is consumed in its production and the cost of any given part is reduced.

The enormous importance of forging operations is shown by the fact that nearly every machine shop has a forge division and every machine – building plant has a forge shop.

Notes: a forge division – ковочный участок  
a forge shop – ковочный цех

VI. Просмотрите текст “Forging” внимательно и подберите английские эквиваленты следующих словосочетаний:

1. Ковочные процессы;
2. Машиностроение;
3. Выплавленная сталь;
4. Улучшать качество стали;
5. Отделение (участок)ковки;
6. По этой причине;
7. Время, необходимое для производства детали;
8. Гораздо меньше стали расходуется;
9. Любая данная деталь;
10. Крайне важны;
11. Без примененияковки.

VII. Закончите следующие предложения:

1. The widespread use of forging is explained by the fact that ... .
2. It has been calculated that in Russia ... .
3. The time required for the manufacture of a part is very ... .
4. The cost of any given part ... .
5. No machine can be built without ... .
6. For this reason, machine parts are generally ... .

VIII. Вставьте пропущенные слова в следующие предложения:

1. One and the same component can be ... by different methods and on different forging machines.
2. The process of making a part by ... consists of several operations.
3. Depending on the ... of forgings, forging processes are classified as hammer forging and die forging.
4. After forging ... becomes stronger.
5. In Russia from 15 to 20 per cent of all the materials produced ... to forging.

---

forged; are subjected; forging; steel; method of production.

IX. Ответьте на следующие вопросы:

1. Where are forging processes extremely important?
2. How many per cent of all the metals produced are subjected to forging?
3. Where is hammer forging and stamping particularly widespread?
4. When do metals become stronger?
5. What proves the enormous importance of forging operations?

“Metallurgical Department”

I. Прослушайте и повторите следующие слова и выражения. Предложения переведите.

1. pressure working – обработка давлением  
(pressure processing)  
The methods of pressure working of metals are widely used.
2. stamping – штамповка
3. pressing – штамповка, прессование  
Such methods of pressure working of metals as pressing, stamping are widely used nowadays.
4. forging – ковка, штамповка  
die forging – горячая штамповка  
cold forging – холодная штамповка  
Die forging and cold forging are also in the sphere of metallurgy.
5. qualified training – квалифицированная подготовка (практика)  
The students have qualified training at the laboratories of the Institute.
6. structural X-ray analysis – рентгеноструктурный анализ  
Students are taught special subjects such as mechanical properties of materials, structural X-ray analysis, etc.
7. demand – требовать  
The rapid development of metallurgy demands a great number of qualified specialists in this field.
8. to take part = to participate – принимать участие  
The graduates of the metallurgical department participate in development of technological process.

II. Прочтите и догадайтесь о значении следующих слов и словосочетаний:

metallurgy, industry, sphere, qualified specialists, technological process, complex geometry, mechanical properties of materials, the theory of elasticity, the theory of plasticity.

III. Подберите эквиваленты:

- |                             |                               |
|-----------------------------|-------------------------------|
| 1. pressure working         | 1. металлургический факультет |
| 2. die forging              | 2. технологический процесс    |
| 3. demand                   | 3. область, сфера             |
| 4. participate              | 4. практика                   |
| 5. qualified training       | 5. горячая штамповка          |
| 6. technological process    | 6. принимать участие          |
| 7. sphere                   | 7. требовать                  |
| 8. metallurgical department | 8. обработка давлением        |

IV. Переведите производные:

press – pressure

develop – developed – development

improve – improved – improvement

metal – metallurgy – metallurgical

work – working

process – processing

V. Подберите антонимы:

1. rapid

2. in general

3. separate

4. different

5. modern

1. the same

2. old

3. general

4. slow

5. in particular

VII. Прослушайте текст “Metallurgical Department”, повторите его за диктором.

### Metallurgical Department

Metallurgy is and has been one of the most important branches of industry. Nowadays because of the rapid development of science and engineering in total, metallurgy and its techniques have been greatly improved and the sphere of their usage has been expanded. At present there exist some separate fields of metallurgy which are quite necessary and important for all branches of industry.

The 4<sup>th</sup> Department (the metallurgical department) trains qualified specialists in the field of pressure working of metals. The graduates of this department participate in development of technological processes of aircraft and engine manufacture.

The metallurgical department was established many years ago. Nowadays it is hard to overestimate the significance of pressure working of metals (stamping, pressing, forging, and so on) for designing modern aircraft parts. Above 80 per cent of modern aircraft parts are made by pressure processing of metals. The methods of pressure working of metals produce aircraft parts of complex geometry, which no other methods can give.

It is also worth mentioning the achievements of our Institute in the field of powder metallurgy.

The rapid development of metallurgy and its growing application demand a great number of qualified engineers in this field. The course of study runs for 5 years. During this period of time students study special subjects, such as mechanical properties of materials, structural X-ray analysis, the theory of elasticity, the theory of plasticity and so on. The high level of training is a basis of their future fruitful work at plants and in research laboratories.

The laboratories where the students have the qualified training are equipped with modern facilities, which allow the students to study properties of metals and alloys.

The graduates of the metallurgical department work at different enterprises of our country.

VII. Закончите предложения:

1. The 4<sup>th</sup> department trains qualified specialists in ... .
2. The graduates of this department participate in ... .
3. Nowadays it is hard to overestimate the significance ... .
4. The methods of pressure working of metals produce ... .
5. During this period of time students study special subjects ... .
6. The laboratories where the student have qualified training ... .

VIII. Составьте предложения, используя словосочетания из колонок:

A

1. Metallurgy is
2. The metallurgical department was established
3. The 4<sup>th</sup> Department trains qualified specialists
4. The methods of pressure working of metals produce the aircraft parts
5. The rapid development of metallurgy demands

B

1. A great number of qualified specialists in this field.
2. Which no other methods can give.
3. About 40 years ago.
4. In the field of pressure working of metals.
5. One of the most important branches of industry.

IX. Вставьте пропущенные слова:

1. Nowadays it is hard ... the significance of pressure working of metals for designing modern aircraft parts.
2. The methods of ... working of metals give the aircraft parts of complex geometry.
3. Growing application of metallurgy ... a great number of qualified specialists in this field.
4. The high level of ... is a basis of their future fruitful work.
5. The laboratories where the students have ... are equipped with modern facilities.

X. Ответьте на вопросы:

1. What is the role of metallurgy?
2. What fields of metallurgy can you name?
3. What methods of metal processing are especially modern at present?
4. Why do we need a great number of qualified specialists in the sphere of metallurgy?
5. What specialists does the metallurgical department train?
6. When was the 4<sup>th</sup> department established?



7. What role does the 4<sup>th</sup> department play in the research work of our Institute?
8. What special subjects do the students of the metallurgical department study?
9. What guarantees the successful work of the students after graduation from the Institute?
10. Where do the graduates work?

I. Прочтите и переведите текст.

**Drawing**

Drawing consists of pulling metal through a die. One type is wire drawing. The diameter reduction that can be achieved in one die is limited but several dies in series can be used to get the desired reduction.

Sheet metal forming is widely used when parts of certain shape and size are needed. It includes forging, bending and shearing. The thickness of the sheet changes a little in processing.

Bending can be done by pressing between two dies. Shearing is a cutting operation similar to that used for cloth. Each of these processes can be used alone, but often all three are used on one part. For example, to make the roof of automobile from a flat sheet, the edges are gripped and the piece pulled in tension over a lower die. Next an upper die is pressed over the top, finishing the forming operation (штамповку), and finally the edges are sheared off to give final dimensions.

II. Постарайтесь запомнить следующие слова.

Drawing – волочение

Pulling – тянуть

Reduction – сокращение

to achieve – достигать

in series – последовательно

desired – желаемое

include – включать

shear – резать

shear off – отрезать

process – обрабатывать

edge – край

to grip – схватывать

lower die – нижний штамп

upper die – верхний штамп

III. Ответьте на следующие вопросы.

1. How can the reduction of diameter in wire drawing be achieved?
2. What does sheet metal forming consist of?
3. Where can it be used?

IV. Найдите в тексте англ. эквиваленты слов и словосочетаний.

1. протягивание металла через фильеру
2. волочение проволоки
3. уменьшение диаметра
4. края отрезаются
5. конечные размеры
6. при обработке

7. определённая форма
8. желаемое уменьшение

V. Переведите следующие предложения на английский язык.

1. Штамповка листового материала включает в себя ковку, изгиб, обрезку.
2. Края листа при штамповке отрезаются для получения конечных размеров.
3. При включении проволоки диаметр отверстия волочильной доски каждый раз уменьшается.
4. Штамповка листового материала широко используется, когда требуется получить детали определённых формы и размера.

I. Прочтите и переведите текст:

**Mechanical Properties of Materials (№ 1)**

Engineers must know how materials respond to external forces, such as tension, compression, torsion, bending and shear.

All materials respond to these forces by elastic deformation. That is, the material returns their original size and form when the external force disappears. The materials may also have permanent deformation or they may fracture. The results of external forces are creep and fatigue.

Compression is a pressure causing a decrease in volume.

Tension is a pulling force. Under tension a material usually stretches, returning to its original length if the force does not exceed the material's elastic limit.

Fatigue is the growth of cracks under stress. It occurs when a mechanical part is subjected to a repeated or cyclic stress, such as vibration. No deformation is seen during fatigue but small localised cracks develop and propagate through the material until the remaining cross-sectional area cannot support the maximum stress of the cyclic force.

Creep is a slow, permanent deformation that results from a steady force acting on a material. The gradual loosening of bolts and the deformation of components of machines and engines are all the examples of creep. Creep extended over a long time finally leads to the rupture of the material.

II. Прослушайте, повторите и запомните слова:

1. to respond to -- отвечать, реагировать
2. tension – напряженность
3. compression – сжатие
4. torsion – кручение
5. to bend – гнуть, согнуть
6. shear – срез
7. external force – внешняя сила
8. fracture – перелом, излом
9. fatigue – усталость металла
10. to stretch – вытягивать, растягивать, удлинять
11. cyclic stress – циклическое напряжение
12. creep – ползучесть
13. steady – устойчивый, постоянный
14. gradual loosening – постепенное ослабление
15. rupture – разрыв
16. cross-sectional area – площадь поперечного сечения

III. Ответьте на следующие вопросы:

1. What must engineers know?
2. How do all the materials respond to external forces?
3. When does fatigue occur?

4. What examples of creep do you know?
5. When does a material stretch?

IV. Закончите предложения:

1. The materials may also ... .
2. Under tension a material usually stretches ... .
3. It occurs when a mechanical part ... .
4. The gradual loosening of bolts ... .
5. Tension is ... .

V. Вставьте пропущенные слова, данные под чертой:

1. All materials ... to these forces by elastic deformation.
2. The results of ... ... are creep and fatigue.
3. Fatigue is ... of cracks under stress.
4. Creep extended over ... ... finally leads to a rupture of the material.
5. Compression is a pressure causing in volume.

---

a long time, the growth, a decrease, respond, external forces.

VI. Перекажите текст «Mechanical Properties of Materials» (Part 1).

I. Прослушайте и прочитайте текст, пользуясь словами.

### Mechanical Properties of Materials (Part № 2)

Density is the amount of mass in a unit volume. It is measured in kilograms per cubic metre. Density is important in any applications where the material must not be heavy.

Stiffness (rigidity) is a measure of the resistance to deformation such as stretching or bending. The Young modulus is a measure of the resistance to simple stretching or compression. It is the ratio of the applied force per unit area (stress) to the fractional elastic deformation (strain). Stiffness is important when a rigid structure is to be made.

Strength is the force per unit area (stress) that a material can support without failing.

The yield strength is the stress at which the material first deforms plastically.

Ductility is the ability of a material to deform without breaking. Materials that are not ductile are brittle. Ductile materials can absorb energy by deformation but brittle materials cannot.

Toughness is the resistance of a material to breaking when there is a crack in it. Toughness is different from strength. The example of a very tough composite is fibreglass that is very flexible and strong.

Creep resistance is the resistance to a gradual permanent change of shape and it becomes especially important at higher temperature.

1. density – плотность
2. to measure – измерять
3. Young modulus – модуль Юнга
4. ratio – соотношение
5. stiffness – жесткость
6. strain – нагрузка, напряжение; деформация
7. stress – давление; напряжение
8. rigid – жесткий
9. ductility – ковкость
10. to absorb – поглощать
11. toughness – прочность, стойкость
12. strength – прочность
13. flexible – гибкий
14. creep resistance – устойчивость к ползучести

II. Дополните предложения:

1. ... in kilograms per cubic metre.
2. The yield strength ...
3. ... can absorb energy by deformation.
4. Toughness is ...

5. Materials that are not ... ..

III. Найдите синонимы:

amount  
heavy  
rigid  
energy  
different  
shape  
to strain

strong  
quantity  
power  
form  
to deform  
hard  
various

IV. Ответьте на вопросы:

1. What is density?
2. Where is density important?
3. What do you know about the Young Modulus?
4. When is stiffness important?
5. What is ductility?
6. How can ductile material absorb energy?
7. What is the example of a very tough composite?
8. What is creep resistance?

V. Вставьте пропущенные слова, которые даны под чертой:

1. The Young modulus is ... of the resistance to simple stretching.
2. Density is important in ... .. where the material must not be heavy.
3. Toughness is ... of a material to breaking.
4. Creep resistance is the resistance to a gradual permanent change of ... .
5. Strength is ... per unit of area.

---

the resistance, in any applications, a measure shape, force.

VI. Перескажите тест "Mechanical Properties of Materials" (Part 2).

I. Прослушайте и прочитайте текст, пользуясь словами.

### Steel

The most important metal in industry is iron and its alloy called steel.

Steel is an alloy of iron and carbon. It is strong and stiff but corrodes easily through rusting. But there are special steels that resist corrosion. The amounts of carbon in a steel influences its properties very much. Steels of low carbon content (mild steels) are quite ductile and are used in the manufacture of sheet iron, wire, and pipes. Medium-carbon steels contain from 0.2 to 0.4 per cent carbon. They are tougher and stronger and used as structural steels.

High-carbon steels contain from 0.4 to 1.5 per cent carbon. They are hard and brittle and used in cutting tools, surgical instruments, razor blades and springs. Tool steel also called silver steel, contains about 1 per cent carbon and is strengthened and toughened by quenching and tempering.

1. alloy – сплав
2. carbon – углерод
3. rusting – ржавчина
4. to resist – сопротивляться
5. content – содержание
6. ductile – пластичный, вязкий
7. manufacture – производство
8. sheet – лист
9. hard – твердый
10. brittle – хрупкий
11. cutting tools – режущие инструменты
12. to strengthen – укреплять
13. quenching – закалка (мгновенное охлаждение)
14. tempering – отпуск (закалка с последующим отпуском)

II. Ответьте на вопросы:

1. What metal is the most important one?
2. What elements does steel consist of?
3. What do properties of steel depend on?
4. What are mild steels?
5. Where are mild steels used?
6. How much carbon do they contain?
7. What properties do high-carbon steel have?
8. Where are high-carbon steels applied?



I. Прочтите и переведите текст.

### Metalworking Processes

Metals are important in industry because they can be easily deformed into useful shapes. Metalworking processes can be divided into five groups:

- 1) Rolling
- 2) Extrusion
- 3) Drawing
- 4) Forging
- 5) Sheet-Metal Forming

During the first four processes metal is subjected to large amounts of strain (deformation). But if deformation goes at a high temperature, the metal will recrystallize, that is, new strain-free grains will grow instead of deformed ones. For this reason metals are usually rolled, extruded, drawn, or forged above their recrystallization temperature. This is called hot working. Under these conditions there is no limit to the compressive plastic strain to which the metal can be subjected.

Other processes are performed below the recrystallization temperature. These are called cold working. Cold working hardens metals and makes the part stronger. But there is a limit to the strain before a cold part cracks.

**Rolling** is the most common metalworking process. More than 90 percent of the aluminium, steel and copper produced is rolled. The most common product is sheet. Rolling can be done either hot or cold. If the rolling is finished cold the surface will be smoother and the product stronger.

**Extrusion** is pushing the billet to flow through the orifice of a die. Products may have either a simple or a complex cross section. Tubes or other hollow parts can be extruded.

In impact extrusion the workpiece is placed in the bottom of a hole and a loosely fitting ram is pushed against it. The ram forces the metal to flow back around it with the gap between the ram and the die determining the wall thickness.

The example of this process is the manufacturing of aluminium beer cans.

II. Постарайтесь запомнить следующие слова и словосочетания:

useful shapes – нужные формы

rolling – прокатка

extrusion – экструзия, выдавливание

drawing – волочение

forging –ковка

sheet – лист

hot working – горячая обработка

cold working – холодная обработка

common – общепринятый, распространенный

product – изделие

to finish – обработка поверхности

to push – тыкать

billet – заготовка, болванка  
orifice – отверстие  
die – штамп, пуансон, матрица, фильера  
cross section – поперечное сечение  
impact extrusion – штамповка выдавливанием  
ram – пуансон, плунжер  
force – форсировать, заставлять  
gap – промежуток, зазор  
to determine – устанавливать, определять

III. Найдите в тексте английские значения следующих слов и словосочетаний:

1. могут легко деформироваться
2. нужные формы
3. подвергать большим деформациям
4. зерна, свободные от деформации
5. температура перекристаллизации
6. отверстие фильеры
7. сложное сечение
8. пустотелые детали
9. зазор между плунжером (пуансоном) и штампом
10. толщина стенки

IV. Ответьте на следующие вопросы:

1. Why are metals so important in industry?
2. What are the main metalworking processes?
3. Why are metals worked mostly hot?
4. What properties does cold working give to metals?
5. What is rolling?
6. Where is it used?
7. What is extrusion?
8. What shapes can be achieved after extrusion?
9. What are types of extrusion?

V. Переведите на английский язык:

1. Холодная обработка делает металл тверже и прочнее.
2. Поверхность холоднокатаного листа более гладкая и он прочнее.
3. Толщина стенки алюминиевой банки определяется зазором между пуансоном и штампом.
4. Поперечное сечение фильеры для экструзии может быть простым или сложным.
5. Во время горячей обработки металл может подвергаться очень большой пластической деформации сжатия.

Учебное издание

## **МАТЕРИАЛЫ ДЛЯ РАЗВИТИЯ НАВЫКОВ УСТНОЙ РЕЧИ**

Методические указания к лабораторным работам по английскому языку

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