Министерство науки и высшего образования Российской Федерации
Федеральное государственное бюджетное образовательное учреждение высшего образования
Санкт-Петербургский горный университет

Кафедра иностранных языков

ИНОСТРАННЫЙ ЯЗЫК
ВЗРЫВНОЕ ДЕЛО

Методические указания к самостоятельным работам для студентов специальности

(21.05.04)

САНКТ-ПЕТЕРБУРГ
2020

УДК 811.111.1 (075.8)

ИНОСТРАННЫЙ ЯЗЫК. Взрывное дело: Методические указания к самостоятельным работам. / Санкт-Петербургский горный университет. Сост. *Э.Р.Скорнякова.* СПб, 2020. 39 с.

Методические указания предназначены для студентов, обучающихся по специальности 21.05.04 «Горное дело», специализация «Взрывное дело» и согласованы с программой по иностранному языку для студентов неязыковых вузов.

Предлагаемый материал направлен на совершенствование навыков профессионально-ориентированного чтения на английском языке. Данные методические указания включают тексты на языке оригинала, а также разработанный комплекс лексико-грамматических упражнений и заданий, способствующих развитию речевой, языковой, социокультурной и информационной компетенций студентов, необходимых для общения в сфере профессиональных интересов. Предназначены для практических занятий по английскому языку со студентами 2-го курса.

Научный редактор: зав. кафедрой иностранных языков Горного университета, канд. фил. наук *Ю.М. Сищук*

Рецензент: канд. псих. наук , доцент *Н.Э. Горохова*, Санкт-Петербургский государственный экономический университет

ПРЕДИСЛОВИЕ

Данные методические указания предназначены для учебно-методического сопровождения курса английского языка для студентов неязыковых вузов, обучающихся по специальности 21.05.04 «Горное дело», специализация «Взрывное дело». Методические указания составлены в соответствии с учебной программой по дисциплине «Иностранный язык» для формирования иноязычной профессиональной компетенции будущих специалистов. В методические указания включены аутентичные тексты, в которых освещаются основные аспекты взрывного дела.

Изучение материала преследует цель развития навыков и умений просмотрового и изучающего чтения текстов по направлению подготовки, а также их перевода на русский язык с последующим использованием полученной информации для речевой практики; овладение студентами иноязычной коммуникативно-речевой компетенцией, позволяющей будущему специалисту осуществлять профессиональную коммуникацию; формирование активного словарного запаса, который включает наиболее употребительные английский термины и выражения по теме «Blasting».

UNIT 1. BLASTING

I. Read and translate the following text.

WHAT IS BLASTING?

Blasting is a process of reducing a solid body, such as rock, to fragments by using an explosive. Conventional blasting operations include drilling holes, placing a charge and detonator in each hole, detonating the charge, and clearing away the broken material.

Upon detonation, the chemical energy in the explosive is liberated, and the compact explosive becomes transformed into a glowing gas with an enormous pressure. In a densely packed hole this pressure can exceed 100,000 atmospheres. The high pressure shatters the area adjacent to the drill hole and exposes the rock beyond to very high stresses and strains that cause cracks to form. Under the influence of the gas pressure, the cracks extend, and the rock in front of the drill hole yields and moves forward. If the distance of the hole to the closest surface is not too great, the rock in front of the hole will break free.

Holes are so placed as to require a minimum quantity of explosive per volume of rock broken (called the powder factor). Most blasthole patterns are based on the fact that fragmentation is most uniform if the exploding charge is within a particular distance from an exposed face of the rock. To break up a large body of rock, charges are placed in a series of holes drilled so that, as the holes nearest the exposed surface are fired, the blasts create new exposed faces at the proper distances from the next set of holes, in which firing of the charges is slightly delayed. The holes are fired in a predetermined order, at intervals of only thousandths of a second.

Blasting is commonly used to break materials such as coal, ore, stone, or other mined materials, to demolish buildings, and to excavate foundations for civil structures.

Blasting is an essential part of the mining cycle. In virtually all forms of mining, rock is broken by drilling and blasting the rock. Blasting technology is the process of fracturing material by the use of a calculated amount of explosive so that a predetermined volume of material is broken. Good blast design and execution are essential to successful mining

operations. Improper or poor practices can have a severely negative impact on the economies of a mine. The use of excessive explosives at a mine site can result in damages to the rock structures and cause unwanted caving and large increases in support costs.

Blasting is used in both open pit and underground mining operations. While traditional blasting utilized black powder and dynamite, there are many different types of explosives used today. Common explosives used in industry now are ANFO (Ammonium Nitrate/Fuel Oil), slurries, and emulsions. Many factors are taken into account when determining what type of blast design or explosive will be used. Rock type, density, and strength are all important factors, as well as fracture condition of the rock, and water conditions [3, c.6-7].

II. Study the following words and expressions:

Blasting –взрывное дело, a solid body – твердое тело, explosive – взрывчатое вещество, взрывчатый материал, conventional blasting operations – стандартные взрывные работы, detonator – детонатор, glowing gas – светящийся газ, drill hole – пробурить скважину, powder factor – удельный расход взрывчатого вещества, blasthole patterns – расположение взрывных скважин, fracture – разлом, трещина, разрыв, ANFO (Ammonium Nitrate/Fuel Oil) – взрывчатая смесь нитрата аммония и дизельного топлива, yield – добывать, извлекать, сломаться.

III. Complete the table and make 5 sentences with any of the words from the table.

verb	noun	adjective/participle
reduce		
	explosive	
	detonation	
extend		
mine		
		equipped

IV. Answer the following questions:

1. What is blasting?
2. What do conventional blasting operations include?
3. What is detonation?
4. What purposes is blasting commonly used for?
5. What impact on the economics of a mine can improper or poor practices in blasting have?
6. What are common explosives used in industry now?
7. What factors are taken into account while determining what type of blast design will be used?

V. Match the left and the right:

Blast	Large or powerful explosion; the action of causing a device such as a bomb to explode
Drill	Industry and activities connected with getting valuable or useful minerals from the ground, for example coal, diamonds, or gold
Explosive	A tool or machine that you use for making holes
Mining	Use explosives to make holes or destroy sth
Detonation	Substance or device that can cause an explosion

VI. Insert the missing words and expressions:

Density, explosive, improper or poor practices, underground mining, to demolish buildings

1. Blasting is a process of reducing a solid body, such as rock, to fragments by using an _____.

2. Blasting is commonly used to break materials such as coal, ore, stone, or other mined materials, _____, and to excavate foundations for civil structures.
3. Blasting is used in both open pit and _____ operations.
4. Rock type, _____, and strength are all important factors, as well as fracture condition of the rock, and water conditions.
5. _____ in blasting can have a severely negative impact on the economies of a mine.

VII. Grammar task. Open the brackets.

1. Bob tried to avoid _____ (**answer**) my question.
2. I _____ (**walk**) home when I met David.
3. You _____ (*a modal verb of obligation*) wear a seatbelt in a car.
4. If you work hard, you _____ (**pass**) your exam.
5. I don't eat _____ (*many/ much/ a little/ a lot*) chocolate.
6. I feel a bit hungry. I think I _____ (**have**) something to eat.
7. What was _____ (*a degree of comparison of* **happy**) day of your life?
8. Let's go out now. It _____ (**not rain**) anymore.
9. In summer John usually _____ (**play**) tennis once or twice a week.
10. The window was open and a bird _____ (**flow**) into the room.
11. Jim always puts _____ (*very few/ a little/ much/ a lot*) salt on his food.
12. I'd like to have a_____ (*a degree of comparison of* **reliable**) car. The one I've got keeps breaking down.
13. I _____ already _____ (**see**) this film twice. Can't we watch another one?
14. The college _____ (**build**) in the 16th century.
15. I _____ (*a modal verb of ability*) speak five languages fluently.
16. Liam is saving money _____ (**buy**) a new car.
17. Kate's eyes are red. She _____ (**cut**) onions.
18. Look at those black clouds! It _____ (**rain**)!

19. If David _____ (**speak**) good English, he would get a job in that new hotel.
20. This castle _____ (**not inhabit**) for nearly a century.

UNIT 2. INVENTION AND EARLY USE OF GUNPOWDER

I. Read and translate the following text. Make up the plan of the text.

Gunpowder developed gradually over time. In 142 AD, during the Han Dynasty, a man named Wei Boyang was the first to write anything about gunpowder. He wrote about a mixture of three powders that would «fly and dance» violently.

By 300 AD, a Jin dynasty scientist named Ge Hong had certainly written down the ingredients of gunpowder and described the explosion. Scientists made gunpowder in ancient China by mixing sulfur, charcoal, and saltpeter, or potassium nitrate. Sulphur: You got sulphur by mining it out of the ground, where it exists naturally as a yellowish rock. Charcoal: You got charcoal by burning wood very slowly, so that it blackened into carbon without burning completely. Saltpeter: You could make potassium nitrate, or saltpeter, by taking animal manure and letting it sit around for a while and decay. Then potassium nitrate crystals formed in the manure, and you could drain them off by washing water through the manure pile. Saltpeter also occurs naturally inside some caves, and you can just go to those caves and mine saltpeter there.

How is gunpowder made? You made gunpowder by mixing the three powders together, using about fifteen parts of saltpeter to three parts of charcoal and two parts of sulphur. The reason gunpowder explodes is that this mixture burns very fast. When it burns, it releases gases that are bigger in volume than the original powder (just the way steam is bigger than water is).

But even though scientists like Ge Hong knew how to make gunpowder, and they knew that it would explode, they didn't have any particular use for gunpowder. For hundreds of years, nobody did use gunpowder much. Slowly people in China started to use gunpowder as fireworks, to make an exciting evening at a big party or for a religious festival.

Two hundred years later, in 904 AD, Chinese inventors saw that you could also use gunpowder as a weapon. First the army used fire arrows and fire spears. That's basically like attaching a firecracker to the end of a spear or an arrow, so it will burn people.

The first (possible) recorded use of gunpowder in an actual battle was in the last days of China's T'ang Dynasty, in 904 AD. That's when the Southern Wu's ruler, Prince Yang Xingmi, may have used fire arrows against Du Hong in the siege of Wuchang, in southern China.

Soon after the use of fire spears, Chinese armies made the next big step. They used gunpowder in the form of rockets. They put small stone cannonballs inside bamboo tubes and shot the cannonballs out by lighting gunpowder at one end. This is the same idea that makes guns and cannons work today.

Nobody knows exactly who was the first to use cannons in war. The first picture of a cannon is from 1128 AD, under the Song Dynasty. Cannons may have existed for a while before that.

The first battle where we know someone used cannons was in 1287, when Yuan Dynasty (Mongol) generals used them to end the Mongol Nayan's rebellion. The Mongol army also used gunpowder bombs when it was trying to invade Japan in 1281 AD. Soon after that, scientists in Japan started to experiment with gunpowder weapons too.

By this time, Chinese engineers probably also used gunpowder to blast rocks away to make roads and canals. They seem to have used gunpowder in underground mines, to break the rock loose so miners could go in and gather up the loose pieces. Probably they also used gunpowder in stone quarries, to break loose pieces of stone [4,5].

Vocabulary

arrow – стрела;
cannonball – пушечное ядро;
charcoal – древесный уголь;
firecracker/fireworks – фейерверк, шутиха;
gradually – постепенно, поэтапно, медленно;
gunpowder – порох, черный порох;
potassium nitrate – нитрат калия;
quarry –карьер, каменоломня;
rebellion – восстание, мятеж;
saltpeter – селитра;
spear – копье;

sulfur – сера;

weapon – оружие, боевое средство

II. Answer the questions.

1. What are ingredients of gunpowder?
2. How do you get sulphur, charcoal, saltpeter?
3. How is gunpowder made?
4. How did the Chinese use gunpowder?

III. Translate the text from Russian into English.

Выдающийся ученый, математик и физик Леонард Эйлер (1707-1783) высказал мнение, что из всех известных ему ученых наилучшее решение по берлинскому конкурсу мог бы дать М.В.Ломоносов и лично просил его взяться за эту работу.

Блестящие работы Михаила Васильевича в области физики, химии, истории, литературы, горного дела и других наук широко известны. Но немногие знают его работы по теории взрыва. Между тем основы физики взрыва впервые в истории науки были заложены именно в его конкурсной работе.

В этом труде великий ученый показал, что взрывная сила пороха зависит от количества выделяющейся теплоты и, самое главное, от скорости реакции.

Таким образом, Михаил Васильевич впервые установил порядок и значение основных параметров, характеризующих взрывчатое превращение. Свои положения о скорости взрывчатого превращения он иллюстрирует сопоставлением скоростей горения пороха и других веществ. Так были заложены основы физики взрыва [1, с.80].

IV. Insert the missing words and expressions:

Cannonballs, charcoal, stone quarries, blast, potassium nitrate, fireworks, gunpowder bombs

1. Scientists made gunpowder in ancient China by mixing sulfur, charcoal, and saltpeter, or _____.
2. Chinese engineers probably also used gunpowder to _____ rocks away to make roads and canals
3. Chinese armies put small stone _____ inside bamboo tubes and shot the _____ out by lighting gunpowder at one end.
4. Slowly people in China started to use gunpowder as _____, to make an exciting evening at a big party or for a religious festival.
5. You got _____ by burning wood very slowly, so that it blackened into carbon without burning completely.
6. Probably Chinese engineers also used gunpowder in _____, to break loose pieces of stone.
7. The Mongol army also used _____ when it was trying to invade Japan in 1281 AD

V. Match the left and the right columns.

300 AD	a man named Wei Boyang wrote about a mixture of three powders that would «fly and dance» violently.
1128 AD	the first (possible) recorded use of gunpowder in an actual battle was in the last days of China's T'ang Dynasty
1281 AD	the first picture of a cannon under the Song Dynasty
142 AD	a Jin dynasty scientist named Ge Hong had certainly written down the ingredients of gunpowder and described the explosion
904 AD	the Mongol army also used gunpowder bombs when it was trying to invade Japan

VI. Find the information about History of gunpowder in Middle East, Mainland Europe, Great Britain, India, Russia.

VII. Grammar task. Open the brackets.

1. I can't give you a decision yet. I need _____ (*very few/ a little/ much/ a lot*) time to think.
2. My father drives _____ (*a degree of comparison of* **fast**) than me.
3. You _____ (*a modal verb of advice*) take warm clothes with you to Dublin. It might be cold at night.
4. I want to lose weight, so this week I _____ (**not eat**) lunch.
5. Suddenly everybody stopped _____ (**talk**). There was silence.
6. That's _____ (*a degree of comparison of* **funny**) joke I've ever heard.
7. It's a big factory. Five thousand people _____ (**employ**) there.
8. If your sister were here, she _____ (**know**) what to do.
9. Susan _____ (**watch**) television when the phone rang.
10. 'Where's your key?' 'I don't know. I_____ (**lose**) it.'
11. My cousin _____ (*a modal verb of ability*) play the violin when she was five.
12. I _____ (**work**) for a charity for eight years.
13. Don't worry about the exam. I'm sure you _____ (**pass**) it.
14. I was very thirsty. I _____ (**drink**) the water very quickly.
15. Alison won't get into university unless she _____ (**get**) good grades.
16. The room looks nice. It _____ (**clean**).
17. Do you have _____ (*many/ much/ a little/a lot*) close friends?
18. It was late, so we decided _____ (**take**) a taxi home.
19. The earth _____ (**go**) round the sun.
20. We _____ (**have**) a party next Saturday. Would you like to come?

UNIT 3. BLASTING IN MINING METHODS

I. Read each word or word combination. Mind the stress. Find the meaning.

Slurry, dry mix, emulsion, ANFO, critical diameter, hydrostatic pressure, temperature, primer, weight strength, bulk strength, sensitivity, resistance, loading procedure, shelf life, reliability, controlled blasting, perimeter blasting, fly rock, secondary blasting, mudcap.

II. Read and translate the text. Make a plan of the text.

Most rocks require blasting prior to excavation in surface mines. Usually four types of explosives are used in surface mining: slurries, dry mixes, emulsions and the hybrid heavy ANFO. Selection of explosives depends on many factors, which primarily includes critical diameter, hydrostatic pressure, temperature, minimum primer weight, density weight strength, bulk strength, gap sensitivity, water resistance, loading procedures, coupling or decoupled properties, shelf life, reliability for bulk operations and overall drilling and blasting economics.

Most of the underground mining methods use blasting as the primary method of rock excavation. Underground blasting provides a good overview for a wide variety of underground blast designs.

Controlled blasting is a technique of blasting for the purpose to reduce the amount of overbreak and to control the ground vibrations. There are different types of controlled blasting techniques.

Pre-splitting is an old but highly recognized technique with the purpose to form a fracture plane beyond which the radical cracks from blasting can’t travel. Other methods include Trim (Cushion) blasting, Smooth blasting (contour or perimeter blasting) for underground mines and muffle blasting as a solution to prevent fly-rock from damaging human habitants and structures.

Irrespective of the method of primary blasting employed, it may be necessary to reblast a proportion of the rock on the quarry floor so as to reduce it to a size suitable for handling by the excavators and crushers available. Two methods of secondary blasting of rock are available. The first, called the plaster or mudcap method, is to fire a charge of explosive

placed on the rock and covered with clay, the shock of the detonating explosive breaking the block. The second technique, known as pop-shooting, is to drill a hole into the block and fire a small charge in this hole, which is usually stemmed with quarry fines.

Non-explosives are used in areas very closed to sensitive structures. These are mostly used in construction industry for breaking oversize rocks, concrete, etc. Rockfrac and Dexpan produce expansion chemicals which are used to break rocks. Most of these are used in limestone and sandstone quarrying. Expansion chemicals require a huge amount of drilling. [3, c.8-9].

III. Match the left and the right.

1. Surface mining	a) гидростатическое давление
2. Critical diameter	b) чувствительность к детонации через зазор
3. Hydrostatic pressure	c) относительная энергия взрывчатого вещества
4. Primer weight	d) соединительные и разъединительные свойства
5. Bulk strength	e) экономический анализ взрывно-бурильных работ
6. Gap sensitivity	f) порядок загрузки
7. Water resistance	g) водопрочность
8. Loading procedures	h) срок хранения
9. Coupling or decoupled properties	i) открытые горные работы
10. Shelf life	j) безопасность объемных работ
11. Reliability for bulk operations	k) вес запала, запальной шашки
12. Drilling and blasting economics	l) критический диаметр

IV. Answer the following questions.

1. What types of explosives are used in surface mining?

2. What is ANFO?
3. What factors influence selection of explosives?
4. How many types of controlled blasting do you know? What are they?
5. How many methods of secondary blasting are mentioned in the text? What are they?
6. What is mudcap method?
7. What is pop-shooting?
8. What areas are non-explosives used?
9. What is the purpose of using non-explosives?

V. Find in the text English equivalents of the following Russian words and expressions.

взрывать заряд, колебания грунта, подошва карьера, открытый карьер, добыча камня, проектирование взрыва, уменьшить объем перебора породы, управляемые взрывные работы, контурное взрывание, известковый и песчаный карьер, среда обитания человека, метод последующего оконтуривания, экскаваторы и дробилки, разлет осколков горной породы, метод взрывания валунов накладным зарядом, каменная мелочь, получение с помощью взрывных работ гладкой поверхности выработок

VI. Insert the missing words and word combinations. Use the words from the box:

Underground blasting, ground vibrations, mudcap method, excavators and crushers, quarry floor, excavation, blast designs, overbreak, pop-shooting, drilling, quarry fines

1. Most rocks require blasting prior to _____ in surface mines.
2. It may be necessary to reblast a proportion of the rock on the _____ so as to reduce it to a size suitable for handling by the _____available.
3. _____ provides a good overview for a wide variety of underground _____.

4. Controlled blasting is a technique of blasting for the purpose to reduce the amount of _____ and to control the _____.

5. The first, called the plaster or _____, is to fire a charge of explosive placed on the rock and covered with clay, the shock of the detonating explosive breaking the block.

6. The second technique, known as _____, is to drill a hole into the block and fire a small charge in this hole, which is usually stemmed with _____.

7. Expansion chemicals require a huge amount of _____.

VII. Find 9 words from the unit:

B	**I**	**S**	**B**	**E**	**X**	**P**	**L**	**O**	**S**	**I**	**V**	**E**	**S**	**D**	**V**
L	**W**	**H**	**P**	**O**	**P**	**S**	**H**	**O**	**O**	**T**	**I**	**N**	**G**	**R**	**F**
A	**Q**	**O**	**V**	**E**	**R**	**B**	**R**	**E**	**A**	**K**	**J**	**E**	**A**	**I**	**L**
S	**U**	**O**	**C**	**E**	**S**	**S**	**I**	**N**	**G**	**O**	**S**	**H**	**R**	**L**	**Y**
T	**A**	**P**	**R**	**E**	**S**	**P**	**L**	**I**	**T**	**T**	**I**	**N**	**G**	**L**	**R**
I	**R**	**A**	**V**	**I**	**R**	**A**	**E**	**S**	**H**	**T**	**I**	**N**	**I**	**N**	**O**
N	**R**	**E**	**X**	**C**	**A**	**V**	**A**	**T**	**I**	**O**	**N**	**A**	**B**	**E**	**C**
G	**Y**	**A**	**N**	**S**	**I**	**P**	**R**	**O**	**A**	**B**	**S**	**N**	**I**	**O**	**K**

VIII. Grammar task. Open the brackets.

1. Sorry, she can't talk to you. She (**have**) _____ a bath.
2. They (**be**) _____ married since 2000.
3. While we (**wait**) _____ for the train, it started to snow.
4. When (**start**) _____ this show?
5. A new airport (**build**) _____ in this city now.
6. Susan (**drink**) _____ coffee every day.

7. This is (*a degree of comparison of* **good**) _____book I've ever read. It is really a page-turner.

8. Where have you been? I (**wait**) _____ for you for 40 minutes.

9. We (**go**) _____ to the cinema yesterday.

10. We will go for a walk if it (**not rain**) _____.

11. Richard has (*many/much/a little/few*) _____ friends. This makes him lonely.

12. My bag is (*a degree of comparison of* **heavy**) _____ than yours. Can you help me to carry it?

13. You (*a modal verb of obligation/not*) _____ touch this switch! It's forbidden by the rules.

14. I (**leave**) _____ at 6 a.m. tomorrow. I bought a return ticket to Moscow two weeks ago.

15. This landscape (**paint**) _____ by Ivan Shish-kin.

16. It's so wonderful (**see**) _____ you again.

17. How (*much/many/a few/a little*)_____ apples do we need to prepare this pie?

18. If I (**know**) _____ hew phone number, I would call her.

19. I usually avoid (**drive**) _____ in the rush hour.

20. Emma (*a modal verb of ability*) _____sing very well when she was four.

UNIT 4. EXPLOSIVES

I. Read and translate the text.

Explosive, any substance or device that can be made to produce a volume of rapidly expanding gas in an extremely brief period. There are three fundamental types: mechanical, nuclear, and chemical. A mechanical explosive is one that depends on a physical reaction, such as overloading a container with compressed air. Such a device has some application in mining, where the release of gas from chemical explosives may be undesirable, but otherwise is very little used. A nuclear explosive

is one in which a sustained nuclear reaction can be made to take place with almost instant rapidity, releasing large amounts of energy. Experimentation has been carried on with nuclear explosives for possible petroleum extraction purposes.

Basically, chemical explosives are of two types: detonating, or high, explosives and deflagrating, or low, explosives. Detonating explosives, such as Trinitrotoluene (TNT) and dynamite, are characterized by extremely rapid decomposition and development of high pressure, whereas deflagrating explosives, such as black and smokeless powders, involve merely fast burning and produce relatively low pressures. Under certain conditions, such as the use of large quantities and a high degree of confinement, some normally deflagrating explosives can be caused to detonate.

Detonating explosives are usually subdivided into two categories, primary and secondary. Primary explosives detonate by ignition from some source such as flame, spark, impact, or other means that will produce heat of sufficient magnitude. Secondary explosives require a detonator and, in some cases, a supplementary booster. A few explosives can be both primary and secondary depending on the conditions of use.

Underground coal mining was formerly by far the largest consumer of black powder. From a performance standpoint, it is probably the best explosive for that purpose. The use of black powder in underground coal mines is no longer allowed in most countries. As a result, black powder production has decreased tremendously.

Nitroglycerin, another chemical explosive, was discovered by an Italian chemist, Ascanio Sobrero, in 1846. Although he first called it pyroglycerin, it soon came to be known generally as nitroglycerin, or blasting oil. Because of the risks inherent in its manufacture and the lack of dependable means for its detonation, nitroglycerin was largely a laboratory curiosity until Immanuel Nobel and his son Alfred made extensive studies of its commercial potential in the years 1859–61. Nobel was granted a patent for the manufacture and use of nitroglycerin in the United States, in 1866. The second most important of Nobel's inventions was dynamite, in 1867. He coined the name from the Greek *dynamis,* «power».

The year 1955, marking the beginning of the most revolutionary change in the explosives industry since the invention of dynamite, saw the development of ammonium nitrate–fuel oil mixtures (ANFO) and ammonium nitrate-base water gels, which together now account for at least 70 percent of the high explosives consumption in the United States.

The largest commercial application of explosives is mining. Whether the mine is on the surface or is buried underground, the detonation or deflagration of either a high or low explosive in a confined space can be used to liberate a fairly specific sub-volume of a brittle material in a much larger volume of the same or similar material. The mining industry tends to use nitrate-based explosives such as emulsions of fuel oil and ammonium nitrate solutions, mixtures of ammonium nitrate prills (fertilizer pellets) and fuel oil (ANFO) and gelatinous suspensions or slurries of ammonium nitrate and combustible fuels [4,5].

Vocabulary

ammonium nitrate prills (fertilizer pellets) – гранулы аммиачной селитры (гранулированные удобрения)
black and smokeless powders – черный и бездымный порох
blasting oil – нитроглицерин
brittle material –хрупкий материал
chemical explosives – химические взрывчатые вещества
combustible fuels – горючее топливо
compressed air – пневматический; сжатый воздух
confined space – стесненное пространство
confinement – замкнутость (заряда взрывчатого вещества, помещенного в зарядную камеру)
consumption – потребление
curiosity – любопытство, удивление, редкая вещь
decomposition – взрывчатое разложение
deflagrating explosives – метательные взрывчатые вещества
detonating explosives – детонирующие взрывчатые вещества
dynamite – динамит
expanding gas – расширяющийся газ
explosive – взрывчатое вещество
flame – пламя
fuel oil – горючие масла
gelatinous suspensions – желатиновые суспензии

ignition – взрывание, инициирование (заряда взрывчатого вещества)
inherent – присущий, неотъемлемый
mechanical explosives – механические взрывчатые вещества
nuclear explosives – ядерные взрывчатые вещества
primary explosives – первичные, инициирующие взрывчатые вещества
rapidly – быстро, стремительно, незамедлительно
secondary explosives – вторичные взрывчатые вещества
spark – искра
substance – вещество
sufficient magnitude – достаточная величина (мощность)
supplementary booster – дополнительный воспламенитель детонатора

II. Answer the following questions.

1. What are three fundamental types of explosives? Give definitions.
2. What are chemical explosives?
3. When was nitroglycerin discovered?
4. Who discovered nitroglycerin?
5. When was dynamite discovered?
6. What are Immanuel and Alfred Nobel famous for?
7. When was ANFO developed?
8. What is the main application of explosives?
9. What explosives does mining industry use most of all?

III. Match the left and the right.

1.expanding	a) reaction
2.brief	b) extraction
3.mechanical	c) quantities
4.physical	d) pressures
5.nuclear	e) booster
6.instant	f) gas
7.petroleum	g) application
8.rapid	h) conditions

9.smokeless	i) change
10.low	j) rapidity
11.certain	k) period
12.large	l) reaction
13.supplementary	m) curiosity
14.laboratory	n) powders
15.revolutionary	o) decomposition
16.commercial	p) explosive

IV. Complete the sentences with the missing words.

combustible, secondary, volatile, high explosives, materials, low explosives, confinement

Explosive 1)_____ may be categorized by the speed at which they expand. Materials that detonate (the front of the chemical reaction moves faster through the material than the speed of sound) are said to be 2) _____ and materials that deflagrate are said to be 3)_____. Explosives may also be categorized by their sensitivity. Sensitive materials that can be initiated by a relatively small amount of heat or pressure are primary explosives and materials that are relatively insensitive are 4) _____ or tertiary explosives.

A wide variety of chemicals can explode; a smaller number are manufactured specifically for the purpose of being used as explosives. In contrast, some materials are merely 5)_____ or flammable if they burn without exploding.

The distinction, however, is not razor-sharp. Certain materials—dusts, powders, gases, or 6) _____ organic liquids—may be simply combustible or flammable under ordinary conditions, but become explosive in specific situations or forms, such as dispersed airborne clouds, or 7) _____ or sudden release.

V. Check your knowledge.

1. What is explosive?
2. What is a detonating explosive?

3. What is a deflagrating explosive?
4. What types of primary explosives do you know?
5. What types of secondary explosives do you know?
6. What are famous Nobel's inventions?
7. What is the largest commercial application of explosives?

VI. Choose one of the listed topics and find more information.

1. Mechanical explosives.
2. Nuclear explosives.
3. Chemical explosives.
4. Nobel's inventions.
5. Application of explosives.

VII. Grammar task. Open the brackets.

1. You (*a modal verb of obligation*) _____ cross the street on the green light.
2. A beautiful picture just (**draw**) _____ by my daughter.
3. I enjoy (**listen**)_____ to music.
4. If I didn't have you, I (**not/know**) _____ what to do.
5. The traffic was ... (*a degree of comparison of* **bad**) than we expected.
6. It's a hospital. You (*a modal verb of obligation/not*) _____ smoke here.
7. Mary has a toothache. She (**eat**) _____ sweets all day.
8. Charles and Margaret (**invite**) _____ to the wedding party yesterday.
9. I (**go**) _____ to the theatre this evening.
10. Did you take (*a little/many/little/lot*) _____ photographs when you were on holiday?
11. The President has a team of bodyguards (**protect**)_____ him.
12. Vanessa is a vegetarian. She (**eat/not**)_____ meat.

13. Venice is ... (*a degree of comparison of* **wonderful**) place I've ever visited.
14. The river (**flow**) _____ very fast today – faster than usual.
15. Their car broke down as they (**drive**) _____ home.
16. We (**not/get**) _____ there on time if we don't catch the bus.
17. I can't find my bag. You (**see**) _____ it?
18. We couldn't afford to keep our car, so we (**sell**)_____ it.
19. The museum was very crowded. There were too (*some/many/little/few*) _____ people.
20. It's too hot here. I (**open**) _____ the window.

UNIT 5. PROPERTIES OF EXPLOSIVE MATERIALS

I. Read and translate the text.

To determine the suitability of an explosive substance for a particular use, its physical properties must first be known. The usefulness of an explosive can only be appreciated when the properties and the factors affecting them are fully understood. Some of the more important characteristics are listed below:

Availability and cost. The availability and cost of explosives are determined by the availability of the raw materials and the cost, complexity, and safety of the manufacturing operations.

Sensitivity. Sensitivity refers to the ease with which an explosive can be ignited or detonated, i.e., the amount and intensity of shock, friction, or heat that is required. The relative sensitivity of a given explosive to impact may vary greatly from its sensitivity to friction or heat. Sensitivity is an important consideration in selecting an explosive for a particular purpose.

Sensitivity to initiation. This is the index of the capacity of an explosive to be initiated into detonation in a sustained manner. It is defined by the power of the detonator which is certain to prime the explosive to a sustained and continuous detonation. Reference is made to the

Sellier-Bellot scale that consists of a series of 10 detonators, from n. 1 to n. 10, each of which corresponds to an increasing charge weight.

Velocity of detonation. The velocity with which the reaction process propagates in the mass of the explosive. Today, velocity of detonation can be measured with accuracy. Together with density it is an important element influencing the yield of the energy transmitted for both atmospheric over-pressure and ground acceleration.

Stability is the ability of an explosive to be stored without deterioration. The following factors affect the stability of an explosive: **chemical constitution.** It is perhaps best to differentiate between the terms thermodynamically stable and kinetically stable by referring to the former as «inert». Contrarily, a kinetically unstable substance is said to be «labile». It is generally recognized that certain groups like nitro ($–NO_2$), nitrate ($–ONO_2$), and azide ($–N_3$), are intrinsically labile. Kinetically, there exists a low activation barrier to the decomposition reaction. **Temperature of storage.** The rate of decomposition of explosives increases at higher temperatures. As a rule of thumb, most explosives become dangerously unstable at temperatures above 70 °C. **Exposure to sunlight.** When exposed to the ultraviolet rays of sunlight, many explosive compounds containing nitrogen groups rapidly decompose, affecting their stability.

The term **power** or **performance** as applied to an explosive refers to its ability to do work. In practice it is defined as the explosive's ability to accomplish what is intended in the way of energy delivery (i.e., fragment projection, air blast, high-velocity jet, underwater shock and bubble energy, etc.).

Density of loading refers to the mass of an explosive per unit volume. Several methods of loading are available, including pellet loading, cast loading, and press loading, the choice being determined by the characteristics of the explosive.

Volatility is the readiness with which a substance vaporizes. Excessive volatility often results in the development of pressure within rounds of ammunition and separation of mixtures into their constituents. Volatility affects the chemical composition of the explosive such that a marked reduction in stability may occur, which results in an increase in the danger of handling.

Many explosives are **toxic** to some extent. Manufacturing inputs can also be organic compounds or hazardous materials that require special handing due to risks (such as carcinogens). The decomposition products, residual solids, or gases of some explosives can be toxic, whereas others are harmless, such as carbon dioxide and water [6].

Vocabulary

air blast – воздушная волна взрыва
as a rule of thumb – как показывает опыт, эмпирически, характерно
appreciate – оценить, понимать ценность, придавать большое значение
availability and cost – пригодность для использования и стоимость
bubble energy – энергия газового пузыря
chemical constitution – химическое строение
charge weight – вес заряда
density of loading – плотность заряжания
deterioration – ухудшение, срабатывание, истирание
determine – определять
detonation power – сила детонатора
hazardous materials – опасные материалы
high-velocity jet – высокоскоростная струя
inert – инертный, нейтральный
initiation – инициирование
intensity of shock, friction – величина напряжения, трения
intensity of heat – степень нагрева
labile – колеблющийся, подвижной
organic compounds – органические соединения
over-pressure and ground acceleration – избыточное давление и ускорение грунта
pellet loading – загрузка таблеток ядерного топлива
propagate – распространять
physical properties – физические свойства
raw materials – сырье
Sellier-Bellot scale – шкала Сельье-Белло
sensitivity – точность, восприимчивость
stability – химическая стойкость (взрывчатого вещества)
suitability – соответствие, годность, возможность применения
underwater shock – подводная ударная волна, подводный взрыв

velocity of detonation – скорость детонации
volatility – летучесть
yield of the energy – выработка энергии

II. Find 9 words from the unit:

L	**A**	**V**	**A**	**I**	**L**	**A**	**B**	**I**	**L**	**I**	**T**	**Y**	**S**	**D**	**V**
O	**W**	**S**	**E**	**N**	**S**	**I**	**T**	**I**	**V**	**I**	**T**	**Y**	**G**	**R**	**E**
A	**Q**	**O**	**I**	**N**	**I**	**T**	**I**	**A**	**T**	**I**	**O**	**N**	**A**	**I**	**L**
D	**U**	**O**	**C**	**E**	**S**	**S**	**I**	**N**	**G**	**O**	**S**	**H**	**R**	**L**	**O**
I	**A**	**P**	**R**	**D**	**E**	**T**	**O**	**N**	**A**	**T**	**O**	**R**	**G**	**L**	**C**
N	**R**	**S**	**T**	**A**	**B**	**I**	**L**	**I**	**T**	**Y**	**I**	**N**	**I**	**N**	**I**
G	**P**	**E**	**R**	**F**	**O**	**R**	**M**	**A**	**N**	**C**	**E**	**A**	**B**	**E**	**T**
G	**Y**	**A**	**N**	**S**	**I**	**V**	**O**	**L**	**A**	**T**	**I**	**L**	**I**	**T**	**Y**

III. Read the text once again and answer the following questions.

1. What are main properties of explosive materials?
2. How is Sellier-Bellot scale used?
3. What property influences the yield of the energy?
4. How many factors affect the stability of an explosive? What are they?
5. What are methods of loading?
6. How does volatility affect the chemical composition of the explosive?
7. What kind of explosives can be toxic?

IV. Translate the text from Russian into English.

По восприимчивости к внешним воздействиям взрывчатые вещества подразделяются на первичные и вторичные. К первичным относят взрывчатые вещества, способные взрываться в небольшой массе при поджигании (быстрый переход горения в детонацию). Они также значительно более чувствительны к механическим воз-

действиям, чем вторичные. Детонацию вторичных взрывчатых веществ легче вызвать (инициировать) ударно-волновым воздействием, причем давление в инициирующей ударной волне должно быть порядка нескольких тысяч или десятков тысяч мПа. Практически это осуществляют с помощью небольших масс первичных взрывчатых веществ, помещенных в капсюль-детонатор, детонация в которых возбуждается от луча огня и контактно передается вторичному взрывчатому веществу. Поэтому первичные взрывчатые вещества называют также инициирующими. Другие виды внешнего воздействия (поджигание, искра, удар, трение) лишь в особых и труднорегулируемых условиях приводят к детонации вторичных взрывчатых веществ. По этой причине широкое и целенаправленное использование бризантных взрывчатых веществ в режиме детонации в гражданской и военной взрывной технике было начато лишь после изобретения капсюль-детонатора как средство инициирования детонации во вторичных взрывчатых веществах [2, с.6].

V. Grammar task. Open the brackets.

1. _____Walter (like)_____ comedies?
2. When Tim was 16, he was a fast runner. He (*a modal verb of ability*) _____ run 1000 meters in 11 seconds.
3. Please stop (**ask**) _____ me questions!
4. He had very (*some/a few/little/many*) _____ information on the subject and could add nothing.
5. I don't think I (**go out**) _____ tonight. I'm too tired.
6. If she studied harder, she (**get**) _____ better marks.
7. Health and happiness are … (*a degree of comparison of* **important**) than money.
8. The hotel wasn't very expensive. It (**not/cost**) _____ very much.
9. It's ... (*a degree of comparison of* **expensive**) car we've ever bought.
10. 'Don't forget to e-mail the letter, will you?' 'I already (**send**)_____ it.
11. Hello, Tom. I (**look**) _____ for you all morning. Where have you been?

12. She (**wear**) _____ a red pullover and black jeans today.
13. This book (**write**) _____ by Agatha Christie.
14. This time last year we (**lie**) _____ on the beach.
15. It was late, so we decided (**take**) _____ a taxi home.
16. We can't buy (*any/few/a little/ lot*) _____ posters in this shop.
17. The art exhibition (**open**) _____ on 3 May and finishes on 15 July.
18. You (*a modal verb of obligation*)_____ keep it a secret. Don't tell anyone.
19. You need not clean the bathroom. It already (**clean**) _____ by my mother.
20. You'll learn a lot about American history if you (**visit**) _____ the exhibition.

UNIT 6. CLASSIFICATION OF EXPLOSIVE MATERIALS

I. Read and translate the text. Make up the plan.

By sensitivity. A **primary explosive** is an explosive that is extremely sensitive to stimuli such as impact, friction, heat, static electricity, or electromagnetic radiation. Some primary explosives are also known as contact explosives. A relatively small amount of energy is required for initiation. As a very general rule, primary explosives are considered to be those compounds that are more sensitive than PETN. As a practical measure, primary explosives are sufficiently sensitive that they can be reliably initiated with a blow from a hammer; however, PETN can also usually be initiated in this manner, so this is only a very broad guideline. Additionally, several compounds, such as nitrogen triiodide, are so sensitive that they cannot even be handled without detonating.

Primary explosives are often used in detonators or to trigger larger charges of less sensitive secondary explosives. Primary explosives are commonly used in blasting caps and percussion caps to translate a physical shock signal. In other situations, different signals such as electrical or physical shock, or, in the case of laser detonation systems, light, are used

to initiate an action, i.e., an explosion. A small quantity, usually milligrams, is sufficient to initiate a larger charge of explosive that is usually safer to handle.

A **secondary explosive** is less sensitive than a primary explosive and requires substantially more energy to be initiated. Because they are less sensitive, they are usable in a wider variety of applications and are safer to handle and store. Secondary explosives are used in larger quantities in an explosive train and are usually initiated by a smaller quantity of a primary explosive. Examples of secondary explosives include TNT and RDX.

Tertiary explosives, also called **blasting agents**, are so insensitive to shock that they cannot be reliably detonated by practical quantities of primary explosive, and instead require an intermediate explosive booster of secondary explosive. These are often used for safety and the typically lower costs of material and handling. The largest consumers are large-scale mining and construction operations. Most tertiaries include a fuel and an oxidizer. ANFO can be a tertiary explosive if its reaction rate is slow.

By velocity. Low explosives are compounds where the rate of decomposition proceeds through the material at less than the speed of sound. The decomposition is propagated by a flame front (deflagration) which travels much more slowly through the explosive material than a shock wave of a high explosive. Under normal conditions, low explosives undergo deflagration at rates that vary from a few centimeters per second to approximately 400 meters per second. Low explosives are normally employed as propellants. Included in this group are petroleum products such as propane and gasoline, gunpowder (including smokeless powder), and light pyrotechnics, such as flares and fireworks, but can replace high explosives in certain applications.

High explosives are explosive materials that detonate, meaning that the explosive shock front passes through the material at a supersonic speed. High explosives detonate with explosive velocity ranging from 3 to 9 km/s. For instance, TNT has a detonation (burn) rate of approximately 5,8 km/s (19,000 feet per second), detonating cord of 6,7 km/s (22,000 feet per second), and C-4 about 8,5 km/s (29,000 feet per second). They are normally employed in mining, demolition, and military applications.

They can be divided into two explosives classes differentiated by sensitivity: primary explosive and secondary explosive.

By composition. Priming compositions are primary explosives mixed with other compositions to control (lessen) the sensitivity of the mixture to the desired property. For example, primary explosives are so sensitive that they need to be stored and shipped in a wet state to prevent accidental initiation. Explosives are often characterized by the physical form that the explosives are produced or used in [6].

Vocabulary

blasting agents – взрывчатые материалы
blasting cap – капсюль-детонатор
detonating cord – детонирующий шнур
electromagnetic radiation – электромагнитное излучение
percussion cap – капсюль-воспламенитель
PETN – пентолит
propellants – метательное взрывчатое вещество
RDX – циклонит
shock wave – ударная волна
supersonic speed – сверхзвуковая скорость
static electricity – статическое электричество
trigger a charge – инициировать заряд
TNT – тротил

II. Answer the following questions.

1. What stimuli is and explosive extremely sensitive to?
2. What explosives are commonly used in blasting caps and percussion caps?
3. Name secondary explosives.
4. What are the applications of blasting agents?
5. What are the rates of low explosives deflagration?
6. What is a detonation rate of TNT?
7. Why do you have to store and ship primary explosives in a wet state?

III. Match the left and the right.

1.static	a) systems
2.electromagnetic	b) agents
3.trigger	c) electricity
4.blasting	d) initiation
5.shock	e) speed
6.detonation	f) radiation
7.blasting	g) products
8.explosive	h) applications
9.large-scale	i) charges
10.construction	j) signal
11.explosive	k) booster
12.petroleum	l) material
13.certain	m) caps
14.supersonic	n) mining
15.accidental	o) operations

IV. Complete the sentences with the missing words.

charges, fuel, contact explosives, property, supersonic speed, decomposition, quantities, shock wave, detonators, detonate, sensitivity

1. Some primary explosives are also known as _____.
2. Primary explosives are often used in _____or to trigger larger _____ of less sensitive secondary explosives.
3. Secondary explosives are used in larger _____ in an explosive train and are usually initiated by a smaller quantity of a primary explosive.
4. Most tertiaries include a _____ and an oxidizer.
5. The _____ is propagated by a flame front (deflagration) which travels much more slowly through the explosive material than a _____ of a high explosive.
6. High explosives are explosive materials that _____, meaning that the explosive shock front passes through the material at a _____.

7. Priming compositions are primary explosives mixed with other compositions to control (lessen) the _____ of the mixture to the desired _____.

V. Grammar task. Open the brackets.

1. Have you finished (**wash**) _____ your hair yet?
2. 'What you (**do**) _____ this time yesterday?' 'I was asleep.'
3. My grandmother loved music. She (*a modal verb of ability*) _____play the piano very well.
4. If you study harder, you … (**pass**) your exam successfully.
5. He spoke (*many/much/little/a lot*) _____ English, so it was difficult to communicate with him.
6. _____ the film (**begin**) _____ at 3.30 or 4.30?
7. This coffee is very weak. I like it a bit ... (*a degree of comparison of* **strong**).
8. I'm tired. I (**go**) _____ to bed now. Goodnight!
9. The sun (**rise**) _____ in the east.
10. Mozart (**write**) _____ more than 600 pieces of music.
11. Did it cost (*very few/ a little/much/ a lot*) _____ to repair the car?
12. What is ... (*a degree of comparison of* **long**) motorway in the UK?
13. He told me his name but I (**forget**) _____ it.
14. This house is quite old. It (**build**) _____ in 1930.
15. We've got plenty of time. We (*a modal verb of absence of necessity*) _____ hurry.
16. 'How did the thief get into the house?' 'I forgot (**shut**) _____ the window.
17. Tim is still watching TV. He (**watch**) _____ TV all day.
18. We (**go**) _____ to a concert tonight. It begins at 7.30.
19. If you (**take**) _____ more exercise, you would feel healthier.
20. A decision (**not/make**) _____ until the next meeting.

UNIT 7. BLASTING SERVICES

I. Read and translate the text.

Dyno Nobel is a global leader in the commercial explosives industry with more than 3,770 employees, including some of the most highly trained blasters in the industry. It manufactures over 54 million pounds of packaged explosives and more than 1,2 million tons of ammonium nitrate capacity. It has 32 manufacturing facilities on three continents (including state-of-the-art initiation systems facilities in the United States, Australia and Mexico) and its Engineering and Technology team supports domestic and export product sales, as well as the use of its cutting-edge technologies around the world.

Dyno Nobel provides a full range of reliable explosives products from manufacturing plants around the world, and blasting services from a distribution network unmatched in the industry.

Orica is the world's largest provider of commercial explosives and innovative blasting systems to the mining, quarrying, oil and gas and construction markets, a leading supplier of sodium cyanide for gold extraction, and a specialist provider of ground support services in mining and tunnelling.

Orica is committed to developing tomorrow's technologies and solving today's challenges together with its customers. Orica is the global leader in commercial explosives and blasting systems, delivering solutions to meet its customer's needs across the surface and underground mining, civil tunnelling, quarrying, construction and oil and gas markets.

Orica's global technical services network of mining engineers, blasting technicians and product support specialists work to improve the efficiency, productivity and safety for its customers operations.

Orica's world-class manufacturing facilities which are strategically located throughout the world and its integrated global and local supply chains ensure reliable supply to customers of the right product, on time, every time.

The blasting systems range includes BlastIQ™ Platform, Bulk Systems, Wireless Initiating System, Electronic Blasting Systems, Initiating Systems, Packaged Explosives and Blasting Services.

DMC has a long history as a safe and efficient contract miner and offers a full-range of underground mine construction and installation services.

DMC offers a full spectrum of underground mine services from mine development to design and construction services, and contract mining expertise. DMC teams are skilled in managing complex projects of all sizes, in many different regions and geological conditions. Each project is supported by a seasoned and multi-disciplinary team of talented engineers, technical experts, project managers, experienced mining staff and a leadership team with one goal in mind – success [7,8,9].

Vocabulary

blaster – взрыватель, приспособление для взрывания
cutting-edge technologies – новейшие технологии
employees – служащие, работники, сотрудники
experienced mining staff – квалифицированные сотрудники горнодобывающей компании
gold extraction – добыча золота
manufacturing facilities – производственное оборудование
manufacturing plants – заводы-изготовители
meet customer needs – отвечать запросам покупателей
multi-disciplinary team – многопрофильная команда
packaged explosives – патронированное взрывчатое вещество
sodium cyanide – цианид натрия
state-of-the-art – ультрасовременный, на передовом технологическом уровне

II. Answer the following questions.

1. How many employees work for Dyno Nobel industry?
2. What does Dyno Nobel provide?
3. What does Orica provide?
4. Name the Orica blasting systems.
5. What does DMC offer?
6. Name other companies providing blasting services.

III. Complete the sentences with the missing words.

blasting technicians, quarrying, packaged, geological conditions, blasting systems, capacity, productivity, contract miner, mine construction

1. Orica is the world's largest provider of commercial explosives and innovative _____ to the mining, _____, oil and gas and construction markets.
2. Orica's global technical services network of mining engineers, _____and product support specialists work to improve the efficiency, _____ and safety for its customers operations.
3. Dyno Nobel manufactures over 54 million pounds of _____explosives and more than 1.2 million tons of ammonium nitrate _____.
4. DMC has a long history as a safe and efficient _____ and offers a full-range of underground _____and installation services.
5. DMC teams are skilled in managing complex projects of all sizes, in many different regions and _____.

IV. Answer the following questions:

1. What University do you study at? What do you know about your University?
2. What faculty do you belong to? When was it founded?
3. What qualifications will you get after graduation?
4. What subjects does the academic program consist of?
5. Which subjects are among your favorite ones at university?
6 .When did you start to think about your future profession? Who helped you to make your choice?
7. Why is the profession of a mining engineer-blaster important?
8. What are you going to do after your graduation? What job would you like to have?
9. What are the career prospects of a mining engineer-blaster?
10. Where can blasters work?

V. These are headings and categories commonly used in CVs.

Marital status, referees, employment history, permanent address, educational background, skills, title, personal details, hobbies and interests, full name, qualifications, date of birth.

Which one means:

a) basic facts about you? ……
b) practical abilities? ……
c) where you live most of the time? ……...
d) what you do in your free time? …….
e) Mr, Mrs, Ms, or Dr? ……
f) when you were born? ……
g) details about your working experience? ……
h) if you are married or single? ……
i) people who can tell us about your qualities and character? ……..
j) proof that you have successfully completed a course? …….
k) schools and college? ……..
l) name and surname? …….

VI. Study the list of things which are important in a job. Choose the three which are most and least important for you.

- opportunities for promotion
- comfortable working conditions
- status and respect
- interesting and satisfying work
- fringe benefits (e. g. company car, private health insurance)
- a good salary
- extended holidays
- colleagues I like
- a fair and reasonable boss
- training opportunities
- job security

VII. Write your own CV.

VIII. Grammar task. Open the brackets.

1. He isn't very popular. He has (*very few/a little/much/a lot*) _____ friends.
2. The weather is too cold in this country. I'd like to live somewhere … (*a degree of comparison of* **warm**).
3. It's very cold this morning. I (*a modal verb of advice*) _____ wear a coat when you go out.
4. '_____Colin (**work**) _____ this week?' 'No, he's on holiday.'
5. Could you please stop (**make**)_____ so much noise?
6. That was ... (*a degree of comparison of* **delicious**) meal I've had for a long time.
7. _____ this room (**clean**) _____ every day?
8. What would you do if you (**win**) _____ a million dollars?
9. How fast you (**drive**) _____ when the accident happened?
10. 'Is Sally here?' 'No, she (**go**) _____ out.'
11. I (*a modal verb of necessity*) _____ get up early. There are a lot of things I want to do.
12. Where have you been? I (**look**) _____ for you for twenty minutes.
13. 'Did you phone Ruth?' 'Oh no, I forgot. I (**phone**) _____ her now.'
14. Paul and I played tennis yesterday. He's much better than me, so he (**win**) _____ easily.
15. Susan won't get into university unless she … (**get**) good grades.
16. The room (**clean**) _____ at the moment.
17. Most of the town is modern. There are (*many/ much/few /a lot*) _____ old buildings.
18. The baby began (**cry**) _____ in the middle of the night.
19. An atheist (**not/believe**) _____ in God.
20. The train (**leave**) _____ Plymouth at 11.30 and arrives in London at 14.45.

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