

МИНИСТЕРСТВО ОБРАЗОВАНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
Учреждение образования
«Витебский государственный технологический университет»

ИНОСТРАННЫЙ ЯЗЫК (АНГЛИЙСКИЙ)

Рабочая тетрадь для практических работ
для студентов специальности
6-05-0713-04 «Автоматизация технологических процессов
и производств»



Витебск
2024

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Одобрено кафедрой «Иностранные языки» УО «ВГТУ»,
протокол № 5 от 21.12.2023.

Рекомендовано к изданию редакционно-издательским
советом УО «ВГТУ», протокол № 4 от 27.12.2023.

Иностранный язык (английский) : рабочая тетрадь / сост. О. В. Бурдыко,
Д. А. Степанов. – Витебск : УО «ВГТУ», 2024. – 44 с.

Рабочая тетрадь предназначена для студентов вузов, обучающихся по специальности 6-05-0713-04 «Автоматизация технологических процессов и производств». Целью рабочей тетради является систематизация знаний студентов по предлагаемой тематике, обогащение их словарного запаса, а также формирование у студентов переводческих навыков и развитие умений профессионально ориентированного иноязычного общения в письменной форме в предполагаемых ситуациях профессионально ориентированной деятельности. Рабочая тетрадь может использоваться как для организации основной аудиторной, так и внеаудиторной работы.

УДК 811.111

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Содержание

UNIT I. ENGINEERING	4
UNIT II. IDEAS AND INNOVATIONS	11
UNIT III. IMPROVEMENT AND DEVELOPMENT	18
UNIT IV. DESIGNING	24
UNIT V. MANUFACTURING AUTOMATION	30
UNIT VI. AUTOMATED ELECTRICAL MACHINES	37
Список использованных источников	43

UNIT I. ENGINEERING



Think!

A. Rank the things given below due to the most/least important for your future job. Why?

B. Continue the list.

money job satisfaction career prospects job security training
recognition free time professional development

VOCABULARY & READING

1. Translate the words (1-4); match them with the topic below.

Topic: *a) work and career; b) education; c) science; d) employment;*

1) advertisement, shortlist, applicant, references, interview;

2) degree, research, post-graduate, academic, bachelor;

3) physicist, experience, opportunity, skills, duties;

4) progress, knowledge, physics, laboratory, experiment.

2. Match the following words to their Russian equivalents below:

*a) единая энергетическая система; b) производственное оборудование;
c) робототехника; d) системы обогрева и охлаждения; e) автомобиль;
f) «железо», детали компьютера; g) настольный ПК; h) плавательное средство;
i) цифровой; j) распределение; k) содержание и техническое обслуживание.*

Hardware _____

Robotics _____

Desktop computers _____

Power grid _____

Maintenance _____

Distribution _____
Digital _____
Heating and cooling systems _____
Motor vehicle _____
Watercraft _____
Industrial equipment _____

3. Write out the odd one, translate the words.

1. information, fiction, observation, investigation, explanation;
2. impact, effect, conflict, knock, contact;
3. scientific, desirable, good, perfect, flawless;
4. technology, archeology, ecology, terminology, vocabulary;

4. Fill the gaps with the correct phrase below.

Analyze information; communicate well; problem solving; good at making decisions; the 21st century; age of technology.

We are living in

- 1) _____ . Some people call it the
- 2) _____ . We need to learn skills such as
- 3) _____ and we need to be able to
- 4) _____ with other people around the world.

Employers are looking for people who can

- 5) _____ well, people who are able to recognize whether information is reliable or not. They also like people who are
- 6) _____ without asking for help.

READING

1. Read the text about what employers are looking for and write down correct paragraphs' headings below.

Communication skills; Imagination; Critical analysis; Problem solving; Decision-making.

Professional skills for the 21st-century

We need to develop all kinds of skills to survive in the 21st century. Some, like

ICT skills and knowledge of the digital world, are taught explicitly in schools in the UK. Here are five less obvious ones for you to think about. These are the sorts of skills that employers may ask you questions about in interviews, so it's a good idea to think about how good you are in these areas. What are your strengths and weaknesses?

1. _____

In the age of technology that we are living in now, it is no longer enough to keep on making the same products. Employers need people who can imagine new approaches and new ideas. Think: Think of an object or gadget you use every day. How could it be improved? Can you think of three improvements?

2. _____

Employers will value workers who are able to see problems before they happen and come up with creative solutions. Think: Imagine you are organizing an end-of-term social event at school. Think of some problems that you could face. Can you think of any solutions?

3. _____

Workers will have to be good communicators. They will have to be able to negotiate and discuss key issues and also write in a clear way without using too many words. Think: How do people communicate with each other in the 21st century?

4. _____

Employers want workers who are able to recognize the difference between information that can be believed and false information. Think: Use the internet to find out three facts about a celebrity or famous figure. Can you verify the information by checking other websites?

5. _____

Individual workers have a growing amount of responsibility. It is important to be able to evaluate a situation and be confident in making a decision. Think: Which three things could you do to (a) be healthier (b) do better at school and (c) help others? Make a decision now to do at least one of these things. Then ... just do it!

2. Choose True (T) or False (F) for these sentences.

1. 21st-century skills are not taught in schools in the UK. ___
2. Employers like workers to be imaginative. ___
3. Employers want workers to think about possible problems. ___
4. Employers like workers to be original when solving problems. ___
5. Future workers will need to be able to write concisely. ___
6. People communicate with each other less in the 21st century. ___
7. Employers believe it is useful to know a lot of information about celebrities. ___
8. Employers don't want workers to make decisions without asking them. ___

3. Fill the gaps with the correct word below.

Solve; make; have; teach; value; discuss; develop; differentiate;

1. UK schools and colleges _____ ICT skills.
2. Employers _____ people with ideas for new approaches.
3. Employers like workers who can _____ problems.
4. Workers need to be able to _____ their work with their team.
5. Workers need to _____ their writing skills.
6. It is important that workers can _____ between truth and lies.
7. Employees in the 21st century _____ more responsibility.
8. Employers like their workers to _____ decisions.

4. Write which of the skills mentioned in the article do you think is the most important. Why? Continue the list of the skills.

GRAMMAR FOCUS

1. Write down the right variant.

1. My name is Maya Thurgood. 2. I'm a professional diver. 3. I love my job, but the schedule _____ (isn't always / is often) easy. 4. I _____ (never / usually) work every day for twenty days, then I have five days off. 5. This _____ (sometimes / always) includes a weekend, but often it doesn't. 6. _____ (Rarely / Once a year), in December and January, I have a six-week break. 7. I almost _____ (always / sometimes) go to a warm place – Hawaii, Mexico, South Africa. 8. The ocean is beautiful and warm in those places, but on holiday, I _____ (usually / never) go diving. I really need a break from it!

2. Put the words and expressions in the correct order to make sentences.

1. the week / with / start / a quick / We / meeting / usually / .

2. work / Do / for / you / travel / sometimes / ?

3. for / arrives / work / late / never / She / .

4. I / weekend / don't / at / often / the / take / home / with / work / me / .

5. to / speak / you / David / Do / once a week / ?

6. work / to / I / underground / the / take / don't always / .

7. minutes / The / twenty / team / meets / rarely / for / than / more / .

8. work / don't / usually / on / I / Mondays

3. Fill the gaps with the right variant.

1. you want to get some really cheap clothes, you need to arrive early. (When; Why; How about;)

2. You get to the shop one or two hours before it opens. (shouldn't; look like; should;)

3. If you see people who they go to a lot of sales, follow them. (should; look; look like;)

4. If you see clothes that designer clothes, go and look at them first. (look; look like; maybe)

5. If you see clothes that old and boring, walk past them and keep looking. (look; look like; should be;)

6. You waste time trying clothes on. Just have a look at them. (look like; should; shouldn't;)

7. ask a friend to save you a place in the line to pay while you look for more clothes? (How about; Why don't you; Let's;)

8. you get home, you can show your friends and family what you bought. (How about; When; If;)

SELF-CHECK & TRANSLATION

1. Read the text and choose the word (A–D) for each gap.

Finding a job

As a new graduate, you've achieved your 1) ____ qualifications and are full of enthusiasm about starting work. You're hoping to 2) ____ a great salary and work decent hours for a company which has state-of-the-art technology and a fantastic location in the center of town. You're hoping for job 3) ____ and are pretty confident that employment 4) ____ are good. The reality for many new graduates is somewhat different.

Many young people start out in jobs unrelated to their degree for the sake of getting some professional 5) _____. Some may have already worked in part-time jobs while studying, either to save up or support themselves through university. Such jobs include working as sales 6) _____ in clothing stores, or other customer 7) _____ jobs in fast-food outlets or for tele-marketing companies to increase their range of workplace 8) _____. While these may not be your ideal job, having any kind of position will automatically make you more marketable.

Many 9) _____ of employment have openings for young people with little or no experience, and this can be invaluable for new graduates. Working as a career, for example, may not be your personal 10) _____, but by demonstrating a desire to learn and showing 11) _____ to a job, no matter what level it is, will prove to potential employers in fields that you really do want to work in that you're perfect for your dream job.

- | | | | |
|-----------------|-----------------|------------------|--------------|
| 1. A academic | B education | C student | D learning |
| 2. A deserve | B collect | C save | D earn |
| 3. A security | B certainty | C safety | D guarantee |
| 4. A roles | B opportunities | C circumstances | D occasions |
| 5. A background | B history | C experience | D tradition |
| 6. A companions | B assistants | C colleagues | D attendants |
| 7. A help | B supply | C duty | D service |
| 8. A talents | B techniques | C skills | D capacities |
| 9. A areas | B departments | C parts | D sections |
| 10. A object | B goal | C end | D result |
| 11. A promise | B obligation | C responsibility | D commitment |

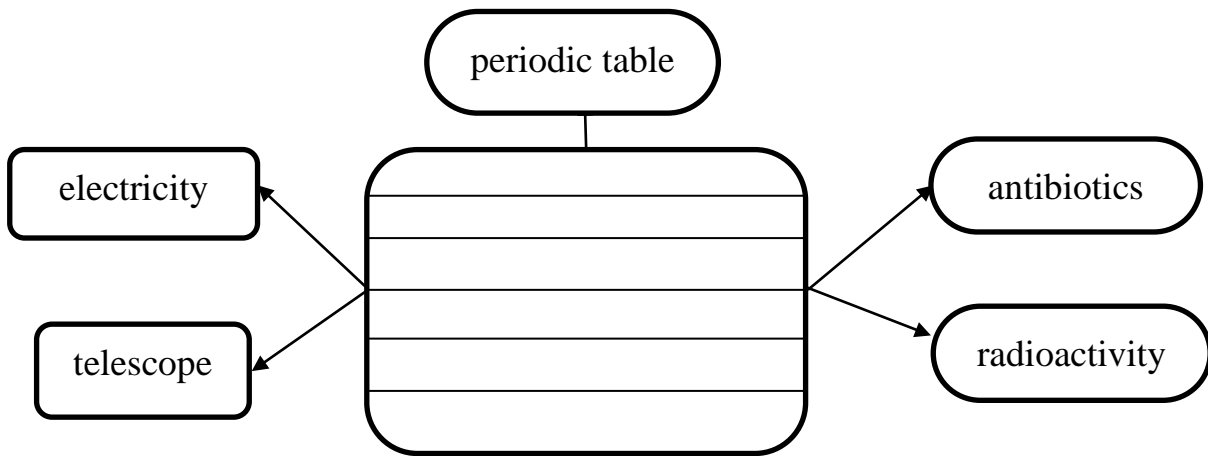
2. Translate the text into Russian.

UNIT II. IDEAS AND INNOVATIONS



Think!

Rank these advances of the past, given below due to the most/least important for you. Why? Continue the list with modern advances. Explain which of these past or modern advances have had the most positive or negative influence on the modern development?



VOCABULARY & READING

1. Complete the definitions with a word from the list below, translate them.

Artificial intelligence (n); biotechnology (n); cell (n); technology (n); brain (n); giant (n); device (n); security (n); chip (n); drone (n); science fiction (n); explosive (n).

1. The application of practical sciences to industry or commerce is

2. A substance that decomposes rapidly under certain conditions with the production of gases, which expand by the heat of the reaction is

3. The study of modelling of human mental functions by computer programs is

4. A tiny wafer of semiconductor material, such as silicon, processed to form a type of integrated circuit or component such as a transistor is

5. The basic structural and functional unit of living organisms is

6. A person or thing of exceptional size or reputation is

7. A pilotless radio-controlled aircraft is

8. The soft convoluted mass of nervous tissue within the skull of vertebrates that is the controlling and coordinating center of the nervous system and the seat of thought, memory and emotion is

9. The state of being secure is

10. A machine or tool used for a specific task is

11. A literary genre that makes imaginative use of scientific knowledge is

12. The technique of using microorganisms, such as bacteria, to perform chemical processing such as waste recycling or to produce other materials, such as beer or wine, cheese, antibiotics, hormones, vaccines is

2. Match the following synonyms (a-l) to the words (1-12):

a) to start; b) brain power; c) to deal with; d) illness; e) to make; f) gadget; g) extra; h) strong; i) form; j) business; k) to get; l) synthetic.

- 1) device _____
- 2) to base _____
- 3) to launch _____
- 4) additional _____
- 5) intelligence _____
- 6) to raise _____
- 7) process _____
- 8) industry _____
- 9) powerful _____
- 10) to create _____
- 11) disease _____
- 12) artificial _____

3. Rearrange letters properly of the words in parentheses.

1. Musk has _____ (onenunadc) he will remove the blocking feature.
2. _____ (rymeflro) known as Twitter.
3. _____ (tirsrect) individual accounts.
4. Block is going to be _____ (dtelede) as a feature.
5. Musk's _____ (holareuv) of his platform.
6. _____ (yfsalof) of employees.

4. Write down all the good and bad things about these social media platforms. Add media platform more and their characteristics.

Social media platforms	Good Things	Bad Things
Facebook		
TikTok		
YouTube		
Instagram		
Reddit		

READING

1. Read the text. Put the available title below.

Elon Musk has announced he will remove the blocking feature from accounts on X, formerly known as Twitter. Mr Musk, who is the owner of X, said users would no longer be able to block comments from unwanted followers. Under the new policy, X users will be unable to restrict individual accounts from contacting them, following them or seeing their posts.

However, people will still be able to block direct messages. Musk wrote on Friday: "Block is going to be deleted as a 'feature,' except for DMs." He added that being allowed to block other people's comments "makes no sense". The change would be the latest in Musk's overhaul of his platform. Others include the name and logo change and layoffs of employees.

Many X users are up in arms over Mr Musk's latest proposal. They believe the block function is essential to keep people safe and to prevent hateful content and harassment from appearing in their feeds. Changpeng Zhao, the CEO of the cryptocurrency company Binance, said Musk should concentrate his efforts on making X safer and easier to use. He said: "X should really solve the bots and spam problems before removing blocks." Another critic said the lack of a blocking feature could make bullying more common. He said it could inhibit the free speech of users who are the targets of bullies and predators. Another observer said people, "need a mechanism to block abusive users".

2. Choose True (T) or False (F) for these sentences.

1. Twitter is formerly known as X. ____
2. X users will still be able to block direct messages. ____
3. Elon Musk said blocking people's comments made sense. ____
4. Elon Musk said he was considering changing his name. ____
5. Many people raised their arms when Twitter became X. ____
6. A crypto-currency CEO said Elon Musk should focus on spam. ____
7. A critic said the new X could increase free speech for targets of bullies. ____
8. Not allowing blocking could increase bullying. ____

GRAMMAR FOCUS

1. Put the words and expressions in the correct order to make sentences.

1. blocking from will He the remove accounts . feature

2. able from block comments unwanted Be followers . to

3. accounts . individual will be unable to restrict Users

4. Musk's his in latest overhaul of platform . The

5. Others logo and layoffs . and name include change,

6. users X Many in arms . are up

7. is essential people safe . The keep to function

8. solve should bots X really problems . the

9. It inhibit the speech of users . free could

10. People a abusive block need users . mechanism to

2. Fill the gaps with the words below:

deleted, unwanted, formerly, layoffs, longer, direct, sense, restrict.

Elon Musk has announced he will remove the blocking feature from accounts on X, 1) _____ known as Twitter. Mr. Musk, who is the owner of X, said users would no 2) _____ be able to block comments from 3) _____ followers. Under the new policy, X users will be unable to 4) _____ individual accounts from contacting them, following them or seeing their posts. However, people will still be able to block 5) _____ messages. Musk wrote on Friday: "Block is going to be 6) _____ as a 'feature,' except for DMs." He added that being allowed to block other people's comments "makes no 7) _____". The change would be the latest in Musk's overhaul of his platform. Others include the name and logo change and 8) _____ of employees.

SELF-CHECK & TRANSLATION

1. Read the text and choose the word (A–D) for each gap.

Elon Musk has announced he will remove the blocking feature from accounts on X, 1) ____ known as Twitter. Mr Musk, who is the owner of X, said users would no 2) ____ be able to block comments from unwanted followers. Under the new policy, X users will be unable to 3) ____ individual accounts from contacting them, following them or seeing their posts.

However, people will still be able to block direct messages. Musk wrote on Friday: "Block is going to be deleted 4) ____ a 'feature,' except for DMs." He added that being allowed to block other people's comments "makes no 5) ____". The change would be the latest in Musk's overhaul of his platform. Others include the name and logo change and 6) ____ of employees.

Many X users are up in 7) ____ over Mr Musk's latest proposal. They believe the block function is essential to keep people safe and to prevent 8) ____ content and harassment from appearing in their feeds. Changpeng Zhao, the CEO of the crypto currency company Binance, said Musk should concentrate his efforts 9) ____ making X safer and easier to use. He said: "X should really 10) ____ the bots and spam problems before removing blocks." Another critic said the lack of a blocking feature could make bullying more common. He said it could 11) ____ the free speech of users who are the targets of bullies and predators. Another observer said people, "need a 12) ____ to block abusive users".

- | | | | |
|-----------------|--------------|---------------|---------------|
| 1. a) formerly | b) firmly | c) femur | d) framer |
| 2. a) shorter | b) lengthen | c) longer | d) shorten |
| 3. a) detach | b) unlock | c) restrict | d) annihilate |
| 4. a) has | b) was | c) be | d) as |
| 5. a) sense | b) sensible | c) sensory | d) senses |
| 6. a) layabouts | b) layoffs | c) layouts | d) laybys |
| 7. a) heads | b) legs | c) hands | d) arms |
| 8. a) hatful | b) hateful | c) hatred | d) hated |
| 9. a) in | b) at | c) on | d) by |
| 10. a) evolve | b) solve | c) involve | d) devolve |
| 11. a) entreat | b) stencil | c) smoke | d) inhibit |
| 12. a) mechanic | b) mechanism | c) mechanical | d) machine |

2. Translate the text into Russian.

UNIT III. IMPROVEMENT AND DEVELOPMENT



Think!

A. Rank these words below. Put the things we should never throw away at the top.

Clothing, shoes, cellphones, computers, books, bicycles, carpets, newspapers.

B. Write down alternatives to these plastic things:

	Alternative	Better?
bags		
straws		
bottles		
utensils		
pens		
furniture		

VOCABULARY & READING

1. Match the materials (1-8) to their definitions (a-h).

- | | |
|--------------------|---|
| 1) stainless steel | a) a metal used to make brass, and in galvanized coatings on steel |
| 2) zinc | b) the predominant metal in steel |
| 3) iron | c) a type of steel not needing a protective coating, as it doesn't rust |
| 4) bronze | d) a dense, poisonous metal |
| 5) lead | e) rocks from which metals can be extracted |
| 6) hardwood | f) an alloy made from copper and tin |
| 7) ore | g) timber from pine trees |
| 8) softwood | h) timber from deciduous trees |

2. Fill the gaps with the words below:

alternatives, utensils, centuries, landscape, hand, invented, pleas, waste.

Plastic has been a blight on the 1) _____ and a deadly threat to wildlife for decades. Environmentalists have issued many

2) _____ for us to reduce the amount of plastic we use or switch to biodegradable 3) _____. One solution to this problem may be at 4) _____. Scientists have developed a form of biodegradable plastic. This means that the billions of plastic bags, cups, straws and 5) _____ that we dispose of each day could be "compostable" – they could decompose and break down as naturally as organic 6) _____. The scientists are from the University of California, Berkeley. They say they have 7) _____ a plastic that could break down within a few weeks, rather than 8) _____, using just heat and water.

3. Match the key properties, different types and grades below to the following materials.

Water-resistant, abrasion-resistant, corrosion-resistant, shock-resistant, tough, brittle, elastic, durable, heavy, lightweight, thermally stable.

Materials	Properties, different types, grades
steel	
glass	
aluminium	
titanium	
gold	
plastic	

4. Rearrange letters properly of the words in parentheses.

1. more technologically _____ (ndeadvca).
2. The _____ (xulyur) carmaker.
3. The car giant unveiled its _____ (tisruitfuc) car.
4. The four _____ (laiztpicade) letters.
5. the car would not be available for _____ (shacepru).
6. in the _____ (npteocc) stage of production.

READING

1. Read the text. Put the available title below.

Plastic has been a blight on the landscape and a deadly threat to wildlife for decades. Environmentalists have issued many pleas for us to reduce the amount of plastic we use or switch to biodegradable alternatives. One solution to this problem may be at hand.

Scientists have developed a form of biodegradable plastic. This means that the billions of plastic bags, cups, straws and utensils that we dispose of each day could be "compostable" – they could decompose and break down as naturally as organic waste. The scientists are from the University of California, Berkeley. They say they have invented a plastic that could break down within a few weeks, rather than centuries, using just heat and water.

The new, biodegradable product involves embedding polyester-eating enzymes into the plastic during the production process. When these enzymes are exposed to heat and water, they eat away at the plastic and reduce it to lactic acid. This provides nutrients for the soil when composted.

Professor Ting Xu said up to 98 per cent of the plastic her team made degraded into small molecules. She said: "We are basically saying that we are on the right track. We can solve this continuing problem of single-use plastics." She added: "Look at all the wasted stuff we throw away – clothing, shoes, electronics like cellphones and computers. We are taking things from the earth at a faster rate than we can return them."

2. Choose True (T) or False (F) for these sentences.

1. The article says plastic is very bright in the landscape. _____
2. The article says scientists have several solutions for plastic. _____
3. The scientists said the plastic they created could be compostable. _____
4. The new biodegradable plastic could take weeks to decompose. _____
5. The new plastic contains enzyme-eating polyester. _____
6. The new plastic biodegrades into lactic acid and feeds the soil. _____
7. A professor said her team are on the left track. _____
8. A professor said we are taking things from Earth at a slower rate. _____

GRAMMAR FOCUS

1. Put the words and expressions in the correct order to make sentences.

1. blight the has on been Plastic a landscape .
-

2. to deadly threat for A wildlife decades .

3. to use . amount of plastic the Pleas reduce

4. as down waste . Break organic as naturally

5. say invented They plastic . they have a

6. to exposed enzymes these When heat . are

7. for when composted . soil the nutrients provides This

8. track . on we're We're saying basically the right

9. earth . the are taking We from things

10. return faster than we A rate can them .

2. Complete the following sentences using: *from, with or of.*

1. Bronze contains significant amounts _____ copper.

2. Galvanized steel is steel-coated _____ zinc.

3. Steel is an alloy derived _____ iron.

4. Pure metals can usually be recovered _____ alloys.

5. To produce stainless steel, iron is mixed _____ other metals.

6. Stainless steel contains quantities _____ chromium and nickel.

7. Glass tableware contains traces _____ metals, such as lead.

8. When new metal is extracted _____ ore, the costs can be high.

SELF-CHECK & TRANSLATION

1. Read the text and choose the word (A–D) for each gap. Put the available title below.

Car makers are 1) ____ a lot of money on electric cars. In the future, electric cars will replace petrol cars. Environmentalists believe this will 2) ____ the amount of CO₂ put into the atmosphere. A big problem for electric cars 3) ____ charging the battery. Some batteries in today's electric cars can take up to 12 hours to charge fully.

However, a company in Israel says it has 4) ____ a lithium-ion battery that people can charge in just five minutes. This is the same amount of time it takes to fill a 5) ____ of gas with petrol. The new lithium-ion batteries were developed by the

ROCK YOUR BRAIN

Write down solution for the task:

Suppose a car goes uphill a distance of 1 mile, then immediately turns around and goes downhill the same distance, and suppose the average rate of the car for the whole trip is 20 miles per hour. What is the total time spent going uphill and downhill in minutes?

- (a) 6;
- (b) 8;
- (c) 10;
- (d) cannot be determined unless the time going downhill is given;
- (e) cannot be determined unless the speed going uphill is given.

For the solution of this task you can use the formula $\text{Rate} \times \text{Time} = \text{Distance}$, that is $r \times t = d$. For the uphill trip, $r (\text{uphill}) \times t (\text{uphill}) = 1 \text{ mile}$. For the downhill trip, $r (\text{downhill}) \times t (\text{downhill})$.

UNIT IV. DESIGNING



Think!

A. Rank these words and phrases below. Put the jobs, which most need humans (not AI) at the top:

gaming coders, movie makers, teachers, newsreaders, lawyers, sales assistants, police officers, doctors.

B. How will artificial intelligence affect these industries? What are the good and bad things? Complete this table.

Industries	Good Things	Bad Things
Gaming		
Movie-making		
English-teaching		
Accountancy		
Writing		
Customer service		

VOCABULARY & READING

1. Match the following words below (1-7) to their definitions (a-g):

1) emergence, 2) consternation, 3) all manner of, 4) went on strike, 5) safeguard, 6) bot, 7) overall.

- _____ a. A feeling of anxiety or dismay.
_____ b. Refuse to work as a form of organized protest for better wages or conditions.
_____ c. Taking everything into account.
_____ d. Many different kinds of.
_____ e. An autonomous program on the internet or another network that can interact with systems or users.
_____ f. The process of coming into existence or prominence.
_____ g. An action taken to protect someone or something or to prevent something bad from happening.

2. Fill the gaps with the words below:

sector; decade; overall; emergence; association; strike; process; manner.

The 1) _____ of artificial intelligence has brought consternation to people in all 2) _____ of industries. The investment bank Goldman Sachs has reported that AI could replace more than 300 million jobs worldwide in the next 3) _____. Hollywood actors went on 4) _____ earlier this week demanding safeguards against AI replacing humans. One 5) _____ that could benefit from bots is gaming. Dr Richard Wilson, boss of the UK games 6) _____ TIGA, said artificial intelligence would, "lead to more games being made and more jobs". He said: "AI would reduce the cost of making games and speed up the 7) _____. Reducing 8) _____ development costs means more game studios, and therefore more jobs."

3. Rearrange letters properly of the words in parentheses.

1. The _____ (mreegence) of artificial intelligence.
2. brought _____ (nsecarnttioo) to people.
3. _____ (aesaugrfd) against AI replacing humans.
4. One _____ (tcseor) that could benefit.
5. the UK games _____ (isoastacion).
6. Reducing _____ (eoarvl) development costs.

4. Match the following synonyms (a- l) to the words (1-12):

a) only, b) worry, c) made, d) change, e) time, f) take over from, g) invented, h) occur, i) difficulty, j) scared.

1. replace _____
2. problem _____
3. just _____
4. developed _____
5. manufactured _____
6. transform _____
7. anxiety _____
8. afraid _____
9. point _____
10. happen _____

READING

1. Read the text. Put the available title below.

Cars are becoming more and more technologically advanced. In the past decade, we have seen improvements in electric car technology and driverless cars. The latest advance comes from Mercedes-Benz. The luxury carmaker has unveiled a car that lets you use your mind to control certain things. The car giant unveiled its futuristic car at the IAA Mobility show in Munich earlier this week. The car is called Vision AVTR.

The four capitalized letters at the end of its name are to make people think of the movie Avatar. This movie was about using the brain to connect with nature. A Mercedes spokesperson said the car would not be available for purchase any time soon. It is currently in the concept stage of production. Mercedes is using a technology called brain-computer interface (BCI) in the Vision AVTR.

The car's computers "read" brain signals and translate them into actions. Mercedes says the system needs about a minute to get to understand a new driver's thought processes. The driver will then be able to perform certain functions in the car using just their thoughts. Mercedes representative Britta Seeger spoke about how exciting she thought the futuristic car was. She said: "Mercedes-Benz is setting another milestone in the merging of man and machine." The Mercedes website says: "As soon as you get in, the car becomes an extension of your own body and a tool to discover the environment."

2. Choose True (T) or False (F) for these sentences.

1. Cars are becoming less technologically advanced. ____
2. The car was unveiled at the New York Motor Show. ____
3. Mercedes named the car based on the movie Avatar. ____
4. The Mercedes car will be on sale from next year. ____
5. Computers in the car spend one minute "reading" the driver's mind. ____
6. A spokeswoman said the car wasn't so futuristic. ____
7. A spokeswoman said the car shows man and machine were joining. ____
8. Mercedes said the car would allow people to discover the environment. ____

GRAMMAR FOCUS

1. Put the words and expressions in the correct order to make sentences.

1. becoming more advanced . Cars are more and technologically
-

2. electric have in seen technology . We car improvements

3. use that your car mind . A you lets

4. its car giant futuristic The unveiled car .

5. in It's stage of currently production . the concept

6. interface . technology Mercedes using a is brain-computer called

7. Get understand a to new driver's thought processes .

8. the How was . futuristic thought she car exciting

9. man merging milestone machine . Another and in

10. becomes body . an extension The your of car

2. Complete the following sentences using:

in; above; around; beneath; within.

1. Projecting _____ the chair was a cluster of ropes' tied to 42 helium-filled weather balloons.

2. Anchor ropes were fastened _____ the bumper of the car.

3. Larry Walters had an air gun inserted _____ his pocket.

4. The helium contained _____ the balloons warmed up in the sun'

5. After takeoff, the anchor ropes remained suspended _____ the chair.

SELF-CHECK & TRANSLATION

1. Read the text. Choose the word (A–D) for each gap. Put the available title below.

The 1) ____ of artificial intelligence has brought consternation to people in all 2) ____ of industries. The investment bank Goldman Sachs has reported that AI could replace more than 300 million jobs worldwide in the next decade. Hollywood actors went 3) ____ strike earlier this week demanding safeguards against AI replacing humans. One 4) ____ that could benefit from bots is gaming. Dr Richard

Wilson, boss of the UK games association TIGA, said artificial intelligence would, "lead to more games being made and more jobs". He said: "AI would reduce the cost of making games and 5) ____ up the process. Reducing 6) ____ development costs means more game studios, and therefore more jobs." Gaming has greatly advanced because of AI and was one of the first industries to 7) ____ it. Daniel Wood, co-CEO of the games body UKIE, told the BBC how important AI has been for his 8) ____.

He said: "The video games industry is always at the cutting edge of technology, so we are already using AI in many areas, including production, art, 9) ____ with in-game characters, and community management to create even more exciting and 10) ____ experiences for our players." He added: "The future possibilities of AI promise a lot of exciting opportunities for our sector." However, 11) ____ believe that it is only a matter of time before newly created jobs in gaming will be 12) ____ over by the bots.

- | | | | |
|-------------------|----------------|---------------|----------------|
| 1. a) emerge | b) emergent | c) emerged | d) emergence |
| 2. a) banner | b) banter | c) matter | d) manner |
| 3. a) off | b) on | c) in | d) at |
| 4. a) vector | b) hector | c) sector | d) nectar |
| 5. a) speeds | b) sped | c) speed | d) speedy |
| 6. a) overall | b) coverall | c) covet | d) enthrall |
| 7. a) utility | b) utilize | c) utile | d) futile |
| 8. a) trade | b) tirade | c) tread | d) thread |
| 9. a) contraction | b) interaction | c) production | d) distraction |
| 10. a) marrying | b) divorcing | c) engaging | d) courting |
| 11. a) scenarios | b) scepters | c) sceptics | d) scents |
| 12. a) been | b) done | c) given | d) taken |

2. Translate the text into Russian.

UNIT V. MANUFACTURING AUTOMATION



Think!

A. Match the following explanations below in italics to the expressions in the table:

manufacturing car parts, TV sets; investment from foreign companies; serving people; steel works; when industry is owned by the government; making things; involving computers; involving new and innovative technology; selling off state enterprises to private companies; involving little or no computer technology; using standard, proven technology; partly state-owned, partly owned by private industries or businesses; money/grants which enable it to stay in profit.

expression	explanation	opposite expression	explanation
heavy industry	_____	light industry	_____
manufacturing industry	_____	service industry	_____
high-technology	_____	low-technology	_____
cutting-edge technology	_____	conventional technology	_____
privatisation	_____	nationalisation / state ownership	_____
public-private partnerships.	_____		
subsidy	_____		
inward investment	_____		

B. Write down types of industries you would like to work in? Why?

VOCABULARY & READING

1. Use the expressions in italics below to rewrite the underlined parts of these sentences with more appropriate vocabulary.

Cutting edge/conventional; service industries/manufacturing industries; heavy industry/light industry; high-technology/high-tech industries, low-technology/low-tech industries; state ownership/nationalization, privatization.

1. The economy cannot depend only on businesses like restaurants and hotels.

We need to encourage industries that make things we can sell.

2. In this area, there are many industries that use computers and things, while in the north, they depend more on industries that don't use such up-to-date technology.

3. The latest, innovative technology is very expensive, so the company has to rely on existing, standard technology.

4. The idea that industries should be owned by the government is less popular than it was, but the trend towards selling off these industries has slowed down.

5. Industry with big factories producing things like steel and so on has declined, and now we're more dependent on industry that makes things like radios and furniture.

2. Here are some more expressions in italics relating to problems in industry. Make sure you know what they mean, then use them to fill the gaps in the sentences below. Use a dictionary if necessary:

black market; copyright infringement; industrial piracy; industrial espionage; money laundering.

1. is a serious problem in many parts of the world, with factories producing illegal copies of top brand names.
2. It was a serious case of The designs for the new aircraft were photographed illegally and sold to a rival company.
3. is a problem for people who make a living writing books. Illegal editions mean that the author receives no payment.
4. is a huge international problem, as police and banks try to trace money from the illegal drugs trade and terrorism.
5. There is a big in the importation of untaxed luxury cars in some countries.

3. Match the following words in italics below (1-7) to their definitions (a-g):
realization; replica; miniature; involve; snowball; secured; berth.

- | | |
|-------|--|
| _____ | a) A place on a ship, train, plane or other means of transport. |
| _____ | b) The fulfillment or achievement of something desired or hoped for. |
| _____ | c) An exact copy or model of something, especially one on a smaller scale. |
| _____ | d) Increase quickly in size, intensity, or importance. |
| _____ | e) Include something as a necessary part or result. |
| _____ | f) Of a much smaller size than normal; very small. |
| _____ | g) Succeeded in getting something, especially with difficulty. |

4. Fill the gaps with the words below.

Predominantly; cubed; parachuted; brainchild; expanse; harsh; nature; stratosphere.

Cutting-edge technology is getting back to (1) _____. A company has tested a new satellite that is (2) _____ made from plywood. The satellite is called Woodsat. It is the (3) _____ of engineer Jari Makinen, co-founder of a Finnish company called Arctic Astronautics. It is just 10cm (4) _____ in size. He has already successfully tested his DIY, but high-tech, device in the (5) _____. He attached it to a weather balloon, which took it to an altitude of 30 km above Earth – just before the endless (6) _____ of space itself. The balloon exploded (as planned) and Woodsat safely (7) _____ back to Earth. Mr Makinen happily reported that all communications equipment survived the (8) _____ conditions.

READING

1. Read the text. Put the available title below.

Cutting-edge technology is getting back to nature. A company has tested a new satellite that is predominantly made from plywood. The satellite is called Woodsat. It is the brainchild of engineer Jari Mäkinen, co-founder of a Finnish company called Arctic Astronautics. It is just 10 cm cubed in size. He has already successfully tested his DIY, but high-tech, device in the stratosphere.

He attached it to a weather balloon, which took it to an altitude of 30km above Earth – just before the endless expanse of space itself. The balloon exploded (as planned) and Woodsat safely parachuted back to Earth. Mr Mäkinen happily reported that all communications equipment survived the harsh conditions. Mäkinen plans to launch Woodsat into space later this year. He said it was the realisation of a dream.

He started a company to produce fully functional wooden replicas of orbit-ready miniature satellites called CubeSats. These are used for space research, education and hobby purposes. Mäkinen explained: "I've always enjoyed making model planes that involve a lot of wooden parts. Having worked in the space education field, this got me wondering why we don't fly any wooden materials into space."

He came up with the idea for Woodsat in 2017 and "the project just snowballed". He said: "We found commercial backing, and secured a berth on an Electron launcher from Rocket Lab in New Zealand."

2. Choose True (T) or False (F) for these sentences.

1. The article says nature is becoming cutting edge. ____
2. A new satellite is made entirely from wood. ____
3. The satellite is one meter in width, depth and length. ____
4. The balloon that took the satellite to the stratosphere exploded. ____
5. The satellite's creator will launch it into space for the first time in 2023. ____
6. The satellite's creator used to make model airplanes. ____
7. The satellite's creator got the idea for the satellite from a snowball. ____
8. The creator found a place on a rocket launcher in New Zealand. ____

GRAMMAR FOCUS

1. Put the words and expressions in the correct order to make sentences.

1. is to nature . technology getting back Cutting-edge
2. made from that plywood . is satellite predominantly A
3. in cubed is It size . 10cm just

4. before of expanse the space endless itself . Just
5. harsh communications All conditions . survived equipment the
6. space launch Makinen Woodsat into to plans later .
7. replicas . A wooden fully functional to produce company
8. wooden a involve parts . of that Planes lot
9. space . We any materials don't fly wooden into
10. up came the with He Woodsat . for idea

2. Put the verbs in brackets in appropriate form so that conditional sentences are correct. Translate the sentences.

1. If he (get) his bachelor's degree, he can apply for the position of an engineer.

2. If she came on time for the interview, she (get) the job.

3. I ... always (work) hard to help your business grow if you hire me.

4. I (succeed) in the interview provided I had not told lies.

5. If I (be) you, I would read all the tips before the interview.

6. If she (write) her CV for hours, she would not have made so many mistakes.

7. If he studies hard, he always(get) good results.

8. Had they prepared for the interview, they (know) answers to all the questions.

SELF-CHECK & TRANSLATION

1. Read the text. Choose the word (a–d) for each gap. Put the available title below.

There is a special job (1) ____ for eight people who love riding motorbikes, enjoy long, hot summers, and like feeling the wind in their (2) _____. The position is a summer internship for the legendary motorcycle maker Harley-Davidson. The company is (3) ____ for people to learn to ride its bikes and then ride them across the USA all summer. It is offering this job to celebrate the 115th anniversary of the (4) ____ of Harley-Davidson. The successful candidates will get special training to

UNIT VI. AUTOMATED ELECTRICAL MACHINES



Think!

A. Match the words *electrical* (adj) and *electric* (adj) to their definitions.

1. _____ refers to something that runs on electricity, is produced by electricity or used for carrying electricity. _____ is used when the object has been specified. For example, _____ light, kettle, etc.

2. _____ refers to something relating to electricity or using electricity. _____ is used in a more general sense. For example, _____ equipment, appliances, etc.

B. Write down what can be “*electric*” and “*electrical*”.

_____ engineer; _____ wires; _____ current; _____ goods; _____ cooker; _____ charge; _____ motor; _____ engineering; _____ power; _____ energy.

VOCABULARY & READING

1. Match the words below (1-9) with a similar meaning (a-i). Check any unknown words in a dictionary.

1. Like; 2. To step down; 3. To reverse; 4. To step up; 5. Fission; 6. To occur; 7. To repel; 8. Friction; 9. To harness.

- _____ a. To raise
- _____ b. To use
- _____ c. Rubbing
- _____ d. The same
- _____ e. To lower
- _____ f. To push away
- _____ g. Splitting
- _____ h. To change
- _____ i. To happen

2. Fill the gaps with the words below:

first; wide; fact; entirely; kind; imagine; stem; example.

Scientists say that a new 1) _____ of robot can reproduce – it can create baby robots. This is an 2) _____ of science fiction becoming science (3) _____. The scientists, from the Universities

of Vermont, Tufts and Harvard, created the world's 4) _____
 "living" robots. They are called "xenobots". Scientists created them in 2020 from the
 5) _____ cells of an African frog. Its scientific name – "xenopus
 laevis" – gave the xenobot its name. The xenobots are less than a millimetre
 6) _____. They can move, work together in groups and self-heal.
 Although they are not what we 7) _____ robots to be, scientists
 say they are technically robots. They are a machine-animal hybrid. The scientists say
 xenobots are "an 8) _____ new life-form".

3. Rearrange letters properly of the words in parentheses.

1. a new kind of robot can _____ (uoedrperc).
2. This is an example of _____ (ciesenc fiction).
3. what we _____ (mnagiei) robots to be.
4. scientists say they are _____ (nhcittlycae) robots.
5. They are a machine-animal _____ (bihyrd).
6. an _____ (itylnere) new life-form.

4. Match the following synonyms (a-l) to the words (1-12).

a) collected; b) totally; c) visualize; d) fix; e) give birth; f) do; g) made;
 h) advantages; i) reality; j) for.

1. reproduce _____
2. fact _____
3. created _____
4. imagine _____
5. entirely _____
6. shape _____
7. gathered _____
8. carry out _____
9. repair _____
10. benefits _____

READING

1. Read the text. Put the available title below.

The path followed by an electric current is known as an **electric circuit**. The simplest electric circuit contains only three parts, i.e. one **load** one **voltage source**, and conductors. Most complete electric circuits contain six parts: 1. an energy source to provide the voltage 2. conductors through which the current can travel, 3. insulators **to confine** the current to the desired paths, 4. a load to control the amount

of current and convert the electric energy taken from the energy source 5. a control device, often a **switch**, to start and stop the flow of current and 6. a protection device to break the circuit in case of a circuit **malfunction**. Basic types of circuits are a **series circuit** and a **parallel circuit**. The series circuit offers a single, continuous path for current flow from the negative side of the **electromotive force** source to the positive one. Different electrical devices like flashlights, doorbells are connected by wires that give only one path to follow. In a parallel circuit, for example, two or more appliances are placed parallel to each other so that the current has more than one path through which it can flow. If one burns out, the current will flow through the other appliances in a circuit. **Household appliances** are connected by parallel circuits so that the whole circuit does not **fail** if one piece of electrical equipment **burns out**.

Electric circuits have to be protected. If there are too many electrical devices, the conducting wire may **overheat** and cause fire or serious **injuries**. To prevent this, **fuses**, through which all the current in the circuits passes, are built into the circuits. A fuse is an intentionally weakened element that opens the circuit automatically if it is **overloaded**. It has a wire with a low **melting** point and when the fuse heats up, the wire melts and the circuit is broken.

2. Choose True (T) or False (F) for these sentences.

1. The required components of a simple circuit include only wires, bulbs and switches. ____
2. Conductors confine the current to the desired circuits. ____
3. The series circuit offers more than one path through which the current can travel. ____
4. Most household appliances are connected by series circuits. ____
5. If any of the appliances in a parallel circuit fails, current still continues to flow through the other appliances in a circuit. ____
6. To prevent fire or other serious injuries, switches are built into the circuits. ____

GRAMMAR FOCUS

Put the words and expressions in the correct order to make sentences.

1. for creating record a Set highest heat . the
2. more this than for 17 It minutes . did
3. supply near-endless of Create clean a energy .
4. scientists want The develop the sun . to artificial
5. costs will this run \$1 trillion over Total year .
6. the been have trying . world Scientists around
7. energy . way the clean It's best produce to
8. fuels . fusion fossil no needs process nuclear The
9. not fusion technology enough is advanced still Nuclear
10. important step . an is project EAST The

SELF-CHECK & TRANSLATION

1. Read the text. Choose the word (a–d) for each gap. Put the available title below.

China has (1) ____ a record for creating the highest heat ever recorded. Scientists created temperatures of (2) ____ to 70,000,000°C in an "artificial sun". The new record was for keeping the heat at a temperature that is five times hotter than the sun. It did (3) ____ for more than 17 minutes. The extreme heat was created in a nuclear fusion reactor. The reactor is part of the Experimental Advanced Superconducting Tokamak project (EAST). It (4) ____ the natural reactions that happen inside our sun and other stars. The scientists want to develop the artificial sun to create a (5) ____-endless supply of clean energy. The EAST project has cost China more than \$950 billion. Total costs will (6) ____ over \$1 trillion this year. Scientists around the world have been (7) ____ for decades to develop nuclear fusion. They say it is the best way (8) ____ produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind (9) ____ dangerous waste. If scientists can make it work, the world will become greener and cleaner. It could also mean (10) ____ fuel bills. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced (11) ____ to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion expert, says the EAST project is an important step. He said: "The recent operation lays a solid scientific and experimental foundation towards the (12) ____ of a fusion reactor."

- | | | | |
|-------------------|---------------|------------|---------------|
| 1. a) set | b) let | c) bet | d) wet |
| 2. a) down | b) along | c) up | d) over |
| 3. a) these | b) them | c) this | d) there |
| 4. a) takes place | b) occurs | c) happens | d) reproduces |
| 5. a) near | b) close | c) far | d) distant |
| 6. a) walk | b) run | c) chase | d) dash |
| 7. a) try | b) tries | c) tried | d) trying |
| 8. a) for | b) to | c) of | d) at |
| 9. a) not | b) never | c) no | d) no's |
| 10. a) cheaply | b) decrease | c) lesser | d) lower |
| 11. a) ample | b) sufficient | c) plenty | d) enough |
| 12. a) walking | b) running | c) dashing | d) sprinting |

2. Translate the text into the Russian.

3. Translate the following sentences into English.

1. – Какие условия существуют для протекания электрического тока? – Во-первых, между двумя точками проводника должна существовать разность потенциалов. Во-вторых, необходим путь для движения электронов.

2. – Ты случайно не знаешь, что Павел чертит на доске? – Если я не ошибаюсь, он чертит простейшую электрическую цепь, которая состоит из источника, нагрузки и проводников.

3. – Разве ты не помнишь основные источники постоянного тока? Мы их обсуждали на прошлой лекции. Это электрохимические батареи, а также фотоэлектрические или солнечные элементы.

4. В последовательной электрической цепи ток имеет только один путь протекания, поэтому недостатком такого соединения является то, что, если хоть один элемент выйдет из строя, ток пропадет во всей цепи.

5. – Что ты делал вчера весь вечер? – Я готовился к экзамену по физике. Я повторял основные понятия и единицы измерения электричества, а также виды

электрического тока и электрических цепей.

6. – Вы все еще будете изучать техническую документацию, когда мы вернемся? – Да, конечно, мы также будем составлять инструкции по технике безопасности.

7. – Почему бытовые приборы в квартире необходимо соединять параллельно? – Насколько я знаю, это более эффективно, поскольку, если один из приборов перегорит, все остальные продолжают свою работу.

8. – Где Иван? – Он устанавливает предохранитель в электрическую цепь. Это важное устройство, которое служит для защиты цепи от повреждений и возгорания.

9. Оборудование работало так шумно, что я не мог услышать, что говорил главный инженер.

10. Вчера в 8 часов вечера они все еще обсуждали недостатки и преимущества нового проекта.

ROCK YOUR BRAIN

Write down solution for the task.

What is the next number in the following sequence: 0 0 1 2 2 4 3 6 4 8 5 ?

- (a) 6;
 - (b) 8;
 - (c) 10;
 - (d) 12;
 - (e)
-

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Учебное издание

ИНОСТРАННЫЙ ЯЗЫК (АНГЛИЙСКИЙ)

Рабочая тетрадь для практических занятий

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Подписано к печати 29.01.2024. Формат 60x90 ¹/₁₆. Усл. печ. листов 2,8.
Уч.-изд. листов 3,1. Тираж 30 экз. Заказ № 38.

Учреждение образования «Витебский государственный технологический университет»
210038, г. Витебск, Московский пр., 72.

Отпечатано на ризографе учреждения образования

«Витебский государственный технологический университет».

Свидетельство о государственной регистрации издателя, изготовителя,
распространителя печатных изданий № 1/172 от 12 февраля 2014 г.

Свидетельство о государственной регистрации издателя, изготовителя,
распространителя печатных изданий № 3/1497 от 30 мая 2017 г.