

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
ХАРКІВСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ МІСЬКОГО  
ГОСПОДАРСТВА**

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**ЗБІРНИК ТЕКСТІВ І ЗАВДАНЬ  
ДЛЯ ОРГАНІЗАЦІЇ САМОСТІЙНОЇ РОБОТИ  
З ДИСЦИПЛІНИ «ІНОЗЕМНА МОВА  
(ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ)  
(АНГЛІЙСЬКА МОВА)»**

(для студентів 1 курсу денної форми навчання напрямку підготовки  
6.050701 – «Електротехнічні системи електроспоживання»,  
«Світлотехніка і джерела світла»)

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Збірник текстів і завдань для організації самостійної роботи з дисципліни «Іноземна мова (за професійним спрямуванням)» (англійська мова) (для студентів 1 курсу денної форми навчання напрямку підготовки 6.050701 – «Електротехнічні системи електроживлення», «Світлотехніка і джерела світла»). /Укл. Писаренко Л.М. – Х.:ХНАМГ, 2009. 68 с., укр., англ. мовами.

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Збірник текстів і завдань рекомендується для самостійної роботи студентів 1 курсу денної форми навчання напрямку підготовки 6.050701 – «Електротехнічні системи електроживлення», «Світлотехніка і джерела світла». Головною метою збірника є формування навичок читання і розуміння інформації з автентичних англомовних джерел, та засвоєння необхідного обсягу лексичного матеріалу, що відповідає вимогам професійно-орієнтованого навчання іноземній мові. Тематика текстів сприяє розширенню обсягу сучасної англійської науково-технічної лексики.

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## TEXT 1

### WHAT IS AN ENTERTAINMENT ELECTRICIAN?

**Task 1. Read the text. Fill in the right column of the table with equivalents of English words and word combinations marked in left part of the text.**

In the theatre, the director directs, the actors act, the designers design, the riggers rig, and the fly man flies. But <b>electricians (1)</b> , by some twist of logic, <b>are responsible for (2)</b> an <b>array of technology (3)</b> , including <b>supplying electricity (4)</b> in a <b>safe and efficient manner (5)</b> . They are also responsible for making sure that everything that is connected to show power <b>is properly rigged (6)</b> , <b>configured (7)</b> , and <b>functioning (8)</b> . The same applies to the <b>production electricians (9)</b> or <b>entertainment electricians (10)</b> who work in a variety of fields — concert tours, industrial and corporate events, theme parks, cruise ships, and more.	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)
A good master electrician needs to have an <b>excellent grasp (11)</b> not only of electricity (no, not literally!), but also of <b>electronics (12)</b> , <b>networking (13)</b> , rigging, safety, local codes and regulations, and everything else involved with keeping the show up and running from a <b>standpoint of safety (14)</b> first and operation second. What, then, is an electrician in the entertainment industry? What <b>distinguishes (15)</b> an electrician from a technician? The answer is not always <b>clear cut (16)</b> , and it might <b>vary from venue to venue (17)</b> , from region to region, and from job to job. But on the most basic level, an electrician is typically responsible for making sure that show power is available for every device that requires it	(12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23)

<p>in order to make the show a success. In some instances that means that he or she must <b>“tie in” the feeder cable (18)</b> to the main supply, or in the case of a theatre or other venue where power is already distributed to the stage electricians, make sure it is distributed properly. But that’s not where the <b>electrician’s area of responsibility (19)</b> ends.</p> <p>Almost all of the responsibility for making sure all of the gear plays well together rests on the backs of the electricians and technicians. That increasingly means rigging a device and running power to it, using the <b>right hardware (20)</b> to <b>make the connection (21)</b>, knowing how networks are wired and distributed, configuring computerized devices like <b>automated lighting (22)</b> and <b>media servers (23)</b>, and more.</p> <p>The show must go on, but it must go on safely. And the electrician must do his or her part to make sure there are no <b>technological glitches (24)</b>.</p>	<p>(24)</p>
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**Task 2. Give English equivalents to the following words and word combinations.**

1. автоматичне освітлення, 2. безпечно та ефективно, 3. бути відповідальним за,
4. бути добре оснащеним, 5. бути скомпонованим, 6. велика кількість техніки,
7. відрізнитися, 8. вірна апаратура, 9. вміння схоплювати все на льоту, 10. з позицій безпеки,
11. інженер-електрик, 12. під’єднувати, 13. підключення до мережі, 14. постачання електрики, 15. сфера відповідальності інженера-електрика,
16. технологічні труднощі, 17. той, що працює, 18. чіткий.

## TEXT 2

### Task 1. Read the text

## HISTORY OF ELECTRICITY

### Discovering Static Electricity

Around 600 BCE, in Greece, a mathematician named Thales discovered that amber rubbed with animal fur attracted light objects. Even though other people may have noticed this before, Thales was the first to record his findings. We don't have his writings, but from other people's reports of his work we can guess at his experiments. We think that Thales noticed static electricity from polishing amber with a piece of wool or fur. After rubbing the amber, which created a static electric charge, other light objects such as straw or feathers stuck to the amber. At this time, magnetism was confused with static electricity.

Later, other experimenters discovered that other substances, such as diamonds, also attracted light objects the same way amber did. These substances are called insulators. They also discovered that other substances, such as copper, silver, and gold, did not attract anything, no matter how long the object was rubbed and no matter how light or heavy the other object was. These are called conductors because they let electricity flow through them.

Electricity has been moving in the world forever. Lightning is a form of electricity. It is electrons moving from one cloud to another or jumping from a cloud to the ground. Have you ever felt a shock when you touched an object after walking across a carpet? A stream of electrons jumped to you from that object. This is called static electricity.

Have you ever made your hair stand straight up by rubbing a balloon on it? If so, you rubbed some electrons off the balloon. The electrons moved into your hair from the balloon. They tried to get far away from each other by moving to the ends of your hair.

They pushed against each other and made your hair move—they repelled each other. Just as opposite charges attract each other, like charges repel each other.

**Task 2. Decide whether the following statements are true or false.**

T      F

1. Thales discovered phenomenon of static electricity.
2. First experiments with amber and wool were made and recorded in the Ancient Rome.
3. Phenomenon of attracting of light objects by amber rubbed with animal fur was called magnetism.
4. Later experiments showed that all materials could produce static electricity.
5. Substances that don't attract objects if they are rubbed are called semiconductors.
6. According to the ability to attract other objects and conduct electricity, all materials can be divided into insulators and conductors.

**Task 3. Find the definitions.**

- |                       |  |
|-----------------------|--|
| 1. charge             | a) the property of attraction displayed by magnets   |
| 2. conductor          | b) any phenomenon associated with stationary electrons, ions, or other charged particles           |
| 3. experiment         | c) the tangible matter of which a thing consists   |
| 4. insulator          | d) a substance, body, or system that conducts electricity, heat, etc                               |
| 5. magnetism          | e) a test or investigation, especially one planned to provide evidence for or against a hypothesis |
| 6. static electricity | f) any material or device that insulates, esp. a material with a                                   |

very low electrical conductivity or thermal conductivity or something made of such a material

7. substance g) to cause to take or store electricity or to have electricity fed into it

### TEXT 3

#### NEW INVENTIONS AND DISCOVERIES

**Task 1. Read the text. Pay attention to the words and word combinations in a bold type.**

In 1660, a German experimenter named Otto Von Guericke built the first **electric generating machine**. He showed that electricity could **be transmitted by** using a wet string **to conduct** electricity several feet.

In the early 1700s, several Englishmen published works that described interesting experiments with electricity. One, Francis Hauksbee, removed air from a glass globe and made the globe rotate while rubbing it with a wool cloth. The globe gave off such a bright light that Hauksbee could read large letters in a dark room. When it got hotter, it attracted light objects from a greater distance. Another experimenter, Stephen Gray, **discovered conductivity**. Gray found that an electric could transmit electricity through another body. He found that even water could **be electrified**. Charles Du Fay, in Paris, **performed many experiments** based on Gray's work. He came to the conclusion that everything and everybody contained electricity, which we know is correct. The only thing he didn't include, strangely enough, was lightning!

During the 18th century everyone **was fascinated by** electricity. Demonstrations of static electric generators were attractions at popular lectures. A mathematics teacher in Holland, Pieter Van Musschenbroek, invented a **storage jar**,

called a Leyden jar, that showed that electricity could be stored for future use. Modern **capacitors** are based on the Leyden jar, and are used in radios, televisions, computers, and the flash for a camera.

Ben Franklin conducted his famous kite experiment in 1752. As a storm was about to break, Franklin flew a kite with a **stiff wire** pointing up that was attached to the top of the kite. He attached a metal key to the other end of the string, and let it hang close to a Leyden jar. Rain **moistened** the string, which began to conduct electricity. Sparks jumped from the key to the jar until the jar could not handle any more **charges**. Although there wasn't any lightning yet, there was enough electricity in the air for Franklin **to prove** that electricity and lightning were the same thing. Franklin also proved that pointed rods conduct electricity better than balls do. He invented **lightning rods** and sold them throughout colonial America.

In Italy, in the late 1700s and early 1800s, two professors made some interesting discoveries. Luigi Galvani discovered that a dead frog's muscles twitched when it was placed near an electrical machine. He conducted experiments to try to explain why a dead frog appeared to jump. Galvani thought the frog's nerves contained the electricity. Alessandro Volta **was interested in** Galvani's experiments but thought the electricity came from the metals, such as the steel knife or the metal table. Volta is best known for inventing the **voltaic pile**, now called an **electric cell** or **battery**, in 1800. He had made a stack of disks of zinc, acid- or salt-soaked paper, and copper. This was the first way to store and control **the release of dynamic electricity**. Volta did not know why his electric cell worked. The volt is named after Volta.

While others concentrated on **generating electricity**, Charles de Coulomb was the first person **to measure** the amount of electricity and magnetism generated in a **circuit**. We still call the **unit of electrical charge** a **coulomb** in his honor.

During the first half of the 19th century, Michael Faraday conducted experiments in England on electricity and magnetism. His work led to modern inventions such as the motor, generator, transformer, telegraph, and telephone.



Faraday also created words we still used, including **electrode**, **anode**, **cathode**, and **ion**. He experimented with induction and discovered a way to generate a lot of electricity at once. We use his principle of **electromagnetic induction** for generating electricity today in **electric utility plants**. But, back then, Faraday was just interested in finding out why things behaved the way they did so he did not put his findings to any practical use.

Many other scientists in the first half of the 1800s contributed a lot to our modern uses of electricity. They include Andre Ampere, of France, who contributed to the measurement of **electric current** and who experimented with electromagnetism. Joseph Henry, an American, worked with electromagnetic induction, as did Faraday. Henry's, Faraday's, and Ampere's work all contributed to the development of the telegraph. Karl Gauss created a set of units to measure the amount of magnetic induction. The unit is called a **gauss**. We **degauss** or **demagnetize** our computer monitors so that **residual magnetism** doesn't spoil the image. Georg Ohm, a German, discovered the relationship among voltage, current and resistance in a circuit using **direct current**. The relationship is called Ohm's Law.

**Task 2. Give Ukrainian equivalents to the following words and word combinations.**

1. first electric generating machine; 2. electricity could be transmitted by using a wet string; 3. conduct electricity several feet; 4. described interesting experiments with electricity; 5. made the globe rotate; 6. attracted light objects from a greater distance; 7. an electric could transmit electricity through another body; 8. everyone was fascinated by electricity; 9. attractions at popular lectures; 10. be stored for future use; 11. sparks jumped from the key to the jar; 12. proved that pointed rods conduct electricity better ; 13. frog's nerves contained the electricity; 14. electricity came from the metals; 15. inventing the voltaic pile; 16. to store and control the release of dynamic electricity; 17. in his honor; 18. work led to modern inventions; 19. principle

of electromagnetic induction; 20. put his findings to any practical use; 21. contributed to the measurement of electric current; 22. electromagnetic induction; 23. relationship among voltage, current and resistance

**Task 3. Give English equivalents to the following words and word combinations.**

1. електричний генератор, 2. електрод, 3. передаватися за допомогою чогось, 4. проводити, 5. відкрити електропровідність, 6. електричний струм, 7. бути наелектризованим, 8. провести багато експериментів, 9. бути зачарованим чимось, 10. електромагнітна індукція, 11. гаусс, 12. посуд для зберігання, 13. конденсатор, 14. анод, 15. жорсткий дріт, 16. заряд, 17. розмагнічувати, 18. доводити, 19. громовідвід, 20. бути зацікавленим у експерименті, 21. іон, 22. електрична батарея, 23. катод, 24. електрична камера, 25. батарея, 26. звільнення електрики, 27. залишковий магнетизм, 28. електроенергетичні компанії, 29. виробляти електрику, 30. вимірювати кількість, 31. електричне коло, 32. одиниця електричного заряду, 33. кулон, 34. постійний струм.

**Task 4. Match the words with their synonyms.**

- |                      |                 |
|----------------------|-----------------|
| 1. to conduct        | a) to focus on  |
| 2. voltaic pile      | b) to do        |
| 3. to remove         | c) transferring |
| 4. to perform        | d) to calculate |
| 5. to concentrate on | e) to degauss   |
| 6. capacitor         | f) to transfer  |
| 7. induction         | g) to produce   |
| 8. to contribute to  | h) to transmit  |
| 9. to measure        | i) to find out  |
| 10. to generate      | j) to support   |
| 11. to discover      | k) battery      |
| 12. to demagnetize   | l) condenser    |

**Task 5. Match the beginning of the phrase with its ending.**

- |   |   |
|---|---|
| 1. it attracted light objects                         | a) based on                                   |
| 2. to measure the amount of electricity and magnetism | b) induction                                  |
| 3. an electric could transmit electricity             | c) of electric current                        |
| 4. capacitors are based on                            | d) electricity could be stored for future use |
| 5. storage jar showed that                            | e) through another body                       |
| 6. experiment with                                    | f) generate a lot of electricity at once      |
| 7. the first way to store and control                 | g) generated in a circuit                     |
| 8. discover a way to                                  | h) the release of dynamic electricity         |
| 9. perform an experiment                              | i) came from the metals                       |
| 10. he thought the electricity                        | j) the Leyden jar                             |
| 11. concentrated on                                   | k) from a greater distance                    |
| 12. contribute to the measurement                     | l) generating electricity                     |

**Task 6. Number the following ideas depending on the order in which they appear in the text.**

Otto Von Guericke found the way to transport electricity several feet by using a wet string.

First light bulb looked like a rotating glass globe that was rubbed with a wool cloth.

Many experiments showed that everything and everybody contain electricity.

Modern radios, televisions and computers are made on the base of a mathematics teacher's in Holland invention.

First battery was made from disks of zinc, acid- or salt-soaked paper, and copper.


Coulomb is a unit of electrical charge.

Experiments with induction brought to discovery of a way to generate a great amount of electricity at once.

## TEXT 4

### DIRECTION AND MAGNETISM

**Task 1. Read the text. Fill in the right column of the table with equivalents of English words and word combinations marked in left part of the text.**

	<p>About 300 years after Thales, a Chinese general named Huang-ti was supposed to be the first to use a <b>lodestone</b> (1) as a <b>compass</b> (2). He might have had a polished piece of lodestone on a piece of wood so polished that the stone could easily have <b>turned to</b> (3) always <b>point north</b> (4). Another version of the story suggests that Huang-ti had a lodestone in a floating bowl. The lodestone would <b>force</b> (5) the bowl <b>to turn</b> with it <b>to face north</b> (6). Chinese military commanders during the Han dynasty (206 B.C.E. to 220 C.E.) used compasses.</p>	<p>(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)</p>
<p>Compasses were used by generals and magicians (who had to find the right places for temples or burial sites) for hundreds of years before they were used on ships. Lodestones were not used for ship navigation until the 1200s, when</p>	<p>(12) (13)</p>	

<p>Chinese navigators began to use a ship's compass.</p> <p>Many doctors during the time of Queen Elizabeth I of England (the late 16th century) were interested in <b>magnetism (7)</b>. They thought magnets might have healing powers for the human body. William Gilbert invented a lightweight tool called a <b>versorium (8)</b> that looked like a compass but didn't use a <b>magnetized needle (9)</b>. The pointer was balanced and would <b>spin (10)</b> in reaction to magnetic attraction even if there wasn't enough force to lift a light object. Nowadays we use a modern version of the versorium called the <b>electroscope (11)</b> to study <b>atomic particles (12)</b>. Gilbert also made up the term electricity. He called objects that <b>attracted (13)</b> his versorium electrics and those that didn't attract the tool <input type="checkbox"/> nonelectrics.</p>	
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**Task 2. Decide whether the following statements are true or false.**

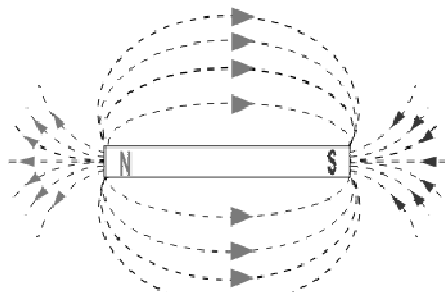
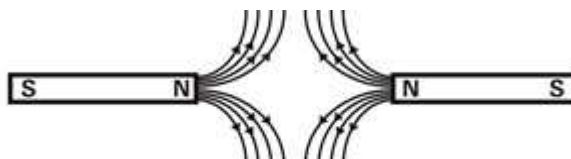
T            F

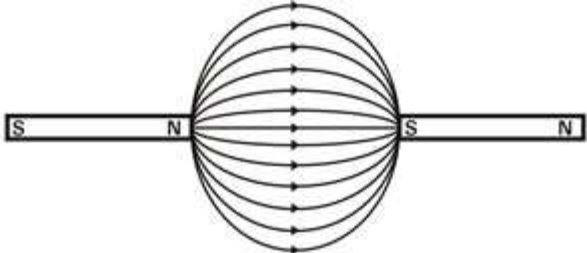
1. In ancient times compasses were used only in military affairs.
2. First compass was invented by Chinese navigator Huang-ti.
3. First compass looked like a polished piece of lodestone on a piece of wood put in a floating bowl..
4. Versorium was a devise that reminded a compass with a magnetized pointer.
5. Versorium is a predecessor of a modern electroscope

TEXT 5

MAGNETS NOWADAYS.

Task 1. Read the text. Complete the blanks in the right column with the appropriate words from left column.

<p>The spinning of the _____ around the _____ of an atom _____ a tiny _____.</p> <p>Most objects are not _____ because the atoms are arranged so that the electrons spin in different, random _____, and cancel out each other.</p>	<p>arranged arrangement attracted creates directions</p>
<p>Magnets are different; the _____ in magnets are _____ so that the electrons _____ in the same direction. This _____ of atoms creates two _____ poles in a magnet, a _____ pole and a _____ pole.</p>	<p>electric generators electrons flows magnetic magnetic field magnetic force molecules</p>
	<p>North pole North-seeking nucleus</p>
<p>A magnet is labeled with North (N) and South (S) poles. The _____ in a magnet _____ from the _____ to the _____. This creates a magnetic field around a magnet.</p>	<p>objects one opposites properties</p>
 <p>Like poles of magnets (N-N or S-S) repel each other.</p>	<p>pull push repel shells</p>

<p>Have you ever held two magnets close to each other? They don't act like most _____. If you try to _____ the South poles together, they _____ each other. Two North poles also repel each other.</p> <p>Turn _____ magnet around and the North (N) and the South (S) poles are _____ to each other. The magnets come together with a _____. Just like protons and electrons, _____ attract.</p>  <p>Opposite poles of magnets (N-S) attract each other.</p> <p>These special _____ of magnets can be used to make electricity. Moving magnetic fields can _____ and push electrons. Some metals, like copper have electrons that are loosely held. They can be pushed from their _____ by moving magnets. Magnets and _____ are used together in _____.</p>	<p>South pole South-seeking spin strong force wire</p>
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**Task 2. Find the definitions.**

- |                   |  |
|-------------------|--|
| 1. create         | a) to rotate or cause to rotate rapidly, as on an axis   |
| 2. arrange        | b) a class of electron orbits in an atom in which the electrons have the same principal quantum number |
| 3. attract        | c) to exert an opposing force on (something)   |
| 4. magnetic field | d) to apply steady force to (something) in order to move it  |
| 5. property       | e) to exert force on (an object) so as to draw it towards the source of the force                      |

6. pull f) a quality, attribute, or distinctive feature of anything, esp a characteristic attribute such as the density or strength of a material
7. push g) a field of force surrounding a permanent magnet or a moving charged particle, in which another permanent magnet or moving charge experiences a force
8. repel h) to exert a force on (a body) that tends to cause an approach or oppose a separation
9. shell i) to put into a proper, systematic, or decorative order
10. spin j) to cause to come into existence

## TEXT 6

### MODERN LIGHT AND POWER

**Task 1. Read the text. Fill in the lines marked with numbers in right column of the table with that are equivalents of English words and word combinations marked in left part of the text.**

1. асинхронний електродвигун, 2. бути кращім ніж, 3. винахідник, 4. нитка накалювання, 5. горіти яскравіше, 6. електрична лампочка розжарювання, 7. електричний мотор, 8. електростанція, 9. забезпечувати електрикою, 10. змінний струм, 11. керувати роботою, 12. передача, 13. постійний струм, 14. робітник, 15. хватати на довше, 16. частота передачі струму

Thomas Alva Edison was an American <b>inventor</b> (1) in	(1)
the second half of the 19th century. He is best known for his	(2)
invention of <b>incandescent light bulbs</b> (2) in 1879. He	(3)
experimented for a year to find the best material for a	(4)



**filament (3)** so the bulb would **burn brighter (4)** and **last longer (5)**. Edison wanted to bring light into every home and factory. He **directed the operation (6)** of the first central commercial incandescent **electric generating station (7)** in the country. It **provided electricity to (8)** one square mile in New York City in 1882. The first day it operated only 52 customers wanted electricity. Edison's generating station used only **direct current (DC) (9)** because he thought that **alternating current (AC) (10)** was dangerous.

One of Edison's **employees (11)**, Nikola Tesla, was an inventor from Croatia. Tesla wanted to develop an alternating current **induction motor (12)** but Edison opposed it. Tesla set up his own laboratory and announced his invention in 1888. George Westinghouse hired Tesla to sell **AC transmission (13)**, using Tesla's induction motor, across America. Everyone but Edison agreed that AC **was superior to (14)** DC. Even Edison's own company, Edison Electric company--now called General Electric--switched to AC. All our **electric motors (15)** today, such as fans, air conditioners, and refrigerators, run on principles set out by Tesla. Tesla also set the standard for the **frequency of the transmission current (16)**, or the number of cycles per second. Today we still operate at 60 hertz.

**Task 2. Decide whether the following statements are true or false.**

T F

1. Thomas Alva Edison was an employer of Nikola Tesla.

2. Edison had a dream to light up each part of the country.
3. Service of the first central commercial incandescent electric generating station wasn't very popular at the early days of its work.
4. Most of the house vehicles are made on principles set out by Edison.
5. The frequency of the transmission current is the number of cycles per minute.

## TEXT 7

### WHAT IS ELECTRICITY?

**Task 1. Read the text. Fill in the lines marked with numbers in right column of the table with that are equivalents of English words and word combinations marked in left part of the text.**

1. Виробництво енергії, 2. відновлювальний, 3. водоспад, 4. водяне колесо, 5. вторинне енергоджерело, 6. втрачати, 7. електрика, 8. електричний струм, 9. електрон, 10. енергія, 11. керосинова лампа, 12. механічна енергія, 13. не відновлювальний, 14. негативно заряджена частка, 15. нейтрально заряджена частка, 16. нейтрон, 17. одержувати, 18. перетворення, 19. першоджерело, 20. піч, 21. позитивно заряджена частка, 22. потік електронів, 23. протон, 24. ядро.

<b>Electricity (1)</b> is a form of <b>energy (2)</b> . Electricity is a	(1)
basic part of nature and it is one of our most widely used	(2)
forms of energy. Many cities and towns were built alongside	(3)
<b>waterfalls (3)</b> (a <b>primary source (4)</b> of <b>mechanical energy</b>	(4)
<b>(5))</b> that turned <b>water wheels (6)</b> to perform work. Before	(5)
<b>electricity generation (7)</b> began over 100 years ago, houses	(6)

were lit with <b>kerosene lamps (8)</b> , food was cooled in	(7)
iceboxes, and rooms were warmed by wood-burning or coal-	(8)
burning <b>stoves(9)</b> .	(9)
Electricity is the flow of electrical power or charge. It	(10)
is a <b>secondary energy source (10)</b> which means that we get	(11)
it from the <b>conversion (11)</b> of other sources of energy, like	(12)
coal, natural gas, oil, nuclear power and other natural sources,	(13)
which are called primary sources. The energy sources we use	(14)
to make electricity can be <b>renewable (12)</b> or <b>non-renewable</b>	(15)
<b>(13)</b> , but electricity itself is neither renewable or non-	(16)
renewable.	(17)
Electricity is the <b>flow of electrons (14)</b> . All matter is made up	(18)
of atoms, and an atom has a center, called a <b>nucleus (15)</b> . The	(19)
nucleus contains <b>positively charged particles (16)</b> called	(20)
<b>protons (17)</b> and <b>uncharged particles (18)</b> called <b>neutrons</b>	(21)
<b>(19)</b> . The nucleus of an atom is surrounded by <b>negatively</b>	(22)
<b>charged particles (20)</b> called <b>electrons (21)</b> . The negative	(23)
charge of an electron is equal to the positive charge of a	(24)
proton, and the number of electrons in an atom is usually	
equal to the number of protons. When the balancing force	
between protons and electrons is upset by an outside force, an	
atom may <b>gain (22)</b> or <b>lose (23)</b> an electron. When electrons	
are "lost" from an atom, the free movement of these electrons	
constitutes an <b>electric current (24)</b> .	

**Task 2. Decide whether the following statements are true or false.**

T F

1. Electricity is a form of energy involving the flow of electrons.
2. Electricity is the flow of electrical power or charge.
3. Atoms are the building blocks of the universe.
4. All matter is made up of atoms, and an atom has a center, called a nucleus.
5. Electricity is a primary energy source and other sources of energy, like coal, natural gas, oil, nuclear power and other natural sources are called secondary sources.
6. Electricity is a controllable and convenient form of energy used in the applications of heat, light and power.
7. Atom is made of particles called protons and neutrons.
8. The protons and electrons of an atom are repelled from each other.
9. The negative charge of the protons is equal to the positive charge of the electrons.
10. When an atom is in balance, it has an equal number of protons and electrons

**Task 3. Complete the sentence appropriate words and word combinations from the text.**

- 1) Everything surrounding us is made of ..... that consist of ....., ....., and .....
- 2) Proton is ....
- 3) Neutron is ....
- 4) Electron is ....
- 5) Primary energy sources are ....., ....., ....., and .....
- 6) Secondary energy source is .....

## TEXT 8

### ENERGY AND ELECTRONS

**Task 1. Read the text. Translate the words and word combinations in bold type.**

The <b>structure (1)</b> of the atom is similar to <b>planetary</b>	(1)
<b>system (2)</b> , electrons orbiting around a central <b>nucleus (3)</b> .	(2)
Electrons also rotate about their own <b>axes (4)</b> . We know the	(3)
<b>rate of electron (5)</b> rotation and the orbital path to <b>determine</b>	(4)
(6) the amount of energy <b>possessed (7)</b> by the atom.	(5)
The total energy contained in any atom is known to be	(6)
the sum of the energies of the individual electrons. Electrons	(7)
of a given atom can, of course, be changed from their position	(8)
by different energies. <b>Radioactive (8)</b> energy emitted from	(9)
the material changes it from one form to another.	(10)
It is also possible to change the atom structure by	(11)
means of controlled <b>nuclear reaction (9)</b> . The atomic bomb	(12)
and the <b>hydrogen bomb (10)</b> are known to be the example of	(13)
great amount of energy contained in an atomic structure.	(14)
There are much simpler methods of changing the amount of	(15)
energy in a given atomic structure. A <b>photoelectric cell (11)</b> ,	(16)
for example, has a large area of <b>photo cathodes (12)</b> made	(17)
from chemically active materials. These materials are known	(18)
to be <b>alkali metals (13)</b> .	(19)
They are electrically active to the degree that they emit	(20)
electrons when <b>struck by (14)</b> light.	(21)
Light falling on the cathode will cause electrons to be	(22)
emitted; the <b>anode (15)</b> being supplied with positive	(23)
potential, electrons will be attracted toward it, producing a	(24)

**photoelectric current (16).** This is well-known **photoemissive cell (17)**; it has many uses in modern industry. Basic laws governing the photoelectric effect were stated by Stoletov. They are also true for the laser operation. There are two basic laws of photoelectricity.

The first law is known to **state (18)** the number of electrons **released (19)** per unit of time from photoelectric **surface (20)** is directly proportional to the intensity of the **incident light (21)**. Thus, the more intense the light, the greater is the number of electrons to be released. This law states that the greater the light intensity, the greater is the **current flow (22)** in the photoelectric cell.

The second law is known to state that the maximum energy of electrons coming from photoelectric surface is independent of the intensity of the incident light and is directly proportional to the **frequency of the light (23)**. It can be shown experimentally that the maximum energy of electrons depends only on the frequency of the light falling of the cathode surface. The higher is the frequency of incident of radiation, the higher is the energy of photoelectrons.

The photoelectrons are those outers of the atom that the light energy which falls on the photocathode **excites (24)**. Thus, the light energy causes **photoemission (25)**.

**Task 2. Put 10 questions to the text.**

**Task 3. Find the definitions of the following words in the right column.**

- |                     |  |
|---------------------|--|
| 1. anode            | a. a flow of electric charge through a conductor . It is measured in amperes.  |
| 2. current flow     | b. define or limit (a notion) by adding or requiring certain features or characteristics                                       |
| 3. nucleus          | c. electron's speed  |
| 4. photoemission    | d. have as a quality, faculty, characteristic, etc   |
| 5. rate of electron | e. make an attack on   |
| 6. to determine     | f. raise (an atom, molecule, electron, nucleus, etc.) from the ground state to a higher energy level                           |
| 7. to excite        | g. the emission of electrons due to the impact of electromagnetic radiation, esp. as a result of the photoelectric effect      |
| 8. to possess       | h. the positive electrode in an electrolytic cell  |
| 9. to release       | i. the positively charged dense region at the centre of an atom, composed of protons and neutrons, about which electrons orbit |
| 10. to strike       | g. to free   |

**Task 4. Number the following ideas depending on the order in which they appear in the text.**

The intense of the light depends on the number of released electrons.

People use the emission from the nuclei both in peaceful and inimical purposes.

The frequency of the incident of radiation is directly proportional to the energy of photoelectrons.

The spontaneous emission can release the energy from the atomic nucleus of some materials changing their structure.

Many years ago people have noticed that even the smallest parts are similar to solar system in their structure.

## TEXT 9

### WHO INVENTED THE LIGHT BULB?

**Task 1. Read the text. Fill in the lines marked with numbers in right column of the table with that are equivalents of English words and word combinations marked in left part of the text.**

1. дугова лампа, 2. приєднаний, 3. безпечний рудниковий ліхтар, 4. життєздатний з комерційної точки зору, 5. дослідження, 6. розвиток, 7. патент, 8. електрична лампочка, 9. порожня трубка, 10. винахід, 11 електричний провід., 12. починати світитися, 13. котушка, 14. стрічка деревинного вугілля.

An easy enough question to answer you might think.	(1)
After all, everyone surely knows that the great American scientific genius and inventor, Thomas Alva Edison invented the <b>light bulb</b> (1) in 1879. But there's a difference there;	(2)
<b>invention</b> (2) and <b>patent</b> (3). He did hold the patent and he did invent his own light bulb, and did indeed make it into a	(3)
<b>commercially viable</b> (4) and successful working invention by	(4)
	(5)
	(6)
	(7)

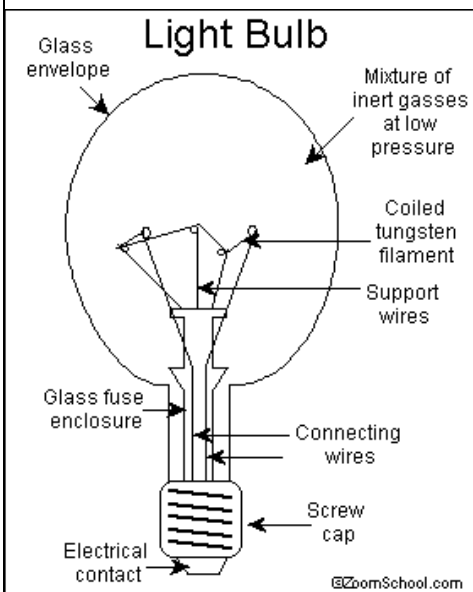


extensive **research (5)** and **development (6)** on original (8)  
ideas, but he did not invent the light bulb. Instead, he bought (9)  
the patents from those who did. (10)

Man-made electrical lighting itself began in circa 1810 (11)  
when a chemist in England called Humphrey Davy (who also (12)  
invented the **miner's safety lamp (7)**, known as the Davy (13)  
lamp) invented the **arc light (8)**. This worked by connecting a (14)  
battery (itself invented in 1800 by Italian physicist Count  
Alessandro Volta, with the word volts being a derivative of  
his name) to two **wires (9)**, and **attaching (10)** the other ends  
of the wires to a **strip of charcoal (11)**. The charcoal (which  
is a form of carbon remember) became electrically charged  
and **began to glow (12)**, with arcs of electricity in the air  
surrounding it.

Then in 1820 Warren De La Rue placed a **coil (13)**  
made of platinum into an **empty tube (14)** and allowed an  
electric current to pass through to form the first known proto-  
light bulb. This lit up well enough but the problem was that  
the chosen material for the coil, platinum was and still is

extremely expensive to obtain,  
making the design a non-  
starter for commercialization.



## **Task 2. Find the definitions.**

- |                |   |
|----------------|---|
| 1. arc light   | a) a cable consisting of several metal strands twisted together   |
| 2. coil        | b) an official document granting a right  |
| 3. invention   | c) a glass bulb containing a gas, such as argon or nitrogen, at low pressure and enclosing a thin metal filament that emits light when an electric current is passed through it |
| 4. light bulb  | d) to shine intensely, as if from great heat  |
| 5. patent      | e) the discovery or production of some new or improved process or machine that is both useful and is not obvious to persons skilled in the particular field                     |
| 6. safety lamp | f) a light source in which an arc between two electrodes, usually carbon, produces intense white illumination   |
| 7. to glow     | g) an oil-burning miner's lamp in which the flame is surrounded by a metal gauze to prevent it from igniting combustible gas  |
| 8. wire        | h) an electrical conductor wound into the form of a spiral, sometimes with a soft iron core   |

## **TEXT 10**

### **FINDING THE FILAMENT**

**Task 1. Read the text. Complete the blanks in the right column with the appropriate words from left column.**

<p>The ideas for _____ (in this case, very fine wires) producing light, was then worked on for years by numerous scientists around the globe. This modern word comes from the Latin 'filare' which means '_____'. The theory behind this change of tack in research was developed by James Prescott Joule, an English physicist who stated that if an electric current was passed through a _____, (the filament), this would itself _____ with a good amount of the _____ produced turning to _____, or light-giving, energy.</p>	<p>cost-effective filaments glow hot inert chambers installation luminous melting point obstacle practical resistant conductor</p>
<p>The prize would be great, but so were the problems. The electric lamp had to be first _____, _____, and then _____; as small as possible in size allowing for easy transportation and _____, and it had to light up the surrounding area well, and not burn out after only a short time. This last problem was the main _____ to _____. Many different materials that had a high _____ were used in _____ and all in a variety of vacuum, partial vacuum or _____. This last point was because the oxygen in the air, while vital for life to exist, causes fires to burn at lower temperatures and at faster rates.</p>	<p>safe significant progress thermal energy to spin trials</p>

**Task 2. Give English equivalents to the following words and word combinations.**

1. безпечний, 2. дослід, спроба, 3. значний прогрес, 4. крутитися, 5. міцний провід, 6. нитка розжарення, 7. перешкода, 8. практичний, 9. прибутковий, 10. різноманітні інертні камери, 11. розжарюватися до червоного кольору, 12. тепла (термальна) енергія, 13. той, що світиться, 14. точка плавлення, 15. установа.

## TEXT 11

### SOURCES OF POWER

**Task 1. Read the text. Fill in the lines marked with numbers in right column of the table with that are equivalents of English words and word combinations marked in left part of the text.**

1. атомне паливо, 2. базуватися на, 3. викопне паливо, 4. використання, 5. виробництво електроенергії, 6. вугілля, 7. двигуни внутрішнього і зовнішнього горіння, 8. досягти успіху, 9. ефективність, 10. за допомогою, 11. індустріальний прогрес, 12. лінії передачі, 13. машини, 14. морський приплив в відплив, 15. нафта, 16. не нескінченні, 17. не потребувати, 18. невтомно працювати, 19. одержувати, 20. отже, 21. перетворюватися на, 22. постачання, 23. приводити в дію генератор, 24. приводити в рух, 25. природній газ, 26. пристрій, 27. промислові підприємства, 28. проміжний цикл, 29. проте, 30. система опалення та освітлення, 31. стандартні процеси, 32. частка, 33. джерело енергії.

<b>SOURCES OF POWER (1).</b>	(1)
The <b>industrial progress</b> (2) of mankind <b>is based on</b> (2)	(2)
(3) power; power for <b>industrial plants</b> (4), <b>machines</b> (5), (3)	(3)
<b>heating and lightening system</b> (6), and transport. In fact one (4)	(4)
can hardly find a sphere where power <b>is not required</b> (7). (5)	(5)
At present most of the power required <b>is obtained</b> (8), (6)	(6)
mainly, from two sources. One is from burning of <b>fossil fuels</b> (7)	(7)
(9), i.e. <b>coal</b> (10), <b>natural gas</b> (11) and <b>oil</b> (12), for producing (8)	(8)
heat that will <b>operate</b> (13) <b>internal and external-</b> (9)	(9)
<b>combustion engines</b> (14). Many of these engines will (10)	(10)
<b>actuate generators</b> (15), which produce electricity. The (11)	(11)

second way of producing electricity is <b>by means of</b> (16)	(12)
generators that get their power from steam of water turbines.	(13)
Electricity so produced then flows through <b>transmission</b>	(14)
<b>lines</b> (17) to houses, industrial plants, enterprises, etc.	(15)
It should be noted, <b>however</b> (18), that the generation of	(16)
electricity by these <b>conventional processes</b> (19) is highly	(17)
uneconomic. Actually, only about 40 (forty) per cent of heat	(18)
in the fuel <b>is converted into</b> (20) electricity. Besides, the	(19)
world resources of fossil fuels <b>are not everlasting</b> (21). On	(20)
the other hand, the power produced hydroelectric plants, even	(21)
if increased many times, will be able to provide only a small	(22)
<b>fraction of</b> (22) the power required in near future.	(23)
Therefore much effort and thought is being given to	(24)
other means of generating electricity.	(25)
One is the energy of hot water. Not long ago we began	(26)
<b>utilizing</b> (23) hot underground water for heating and hot	(27)
water <b>supply</b> (24), and in some cases, for the <b>generation of</b>	(28)
<b>electric power</b> (25).	(29)
Another promising field for the production of	(30)
electricity is the use of <b>oceans tides</b> (26).	(31)
The energy of the Sun, which is being used in various	(32)
ways, represents a practically unlimited source.	(33)
Using <b>atomic fuel</b> (27) for the production of electricity	
is highly promising. It is a well-known fact, that one pound of	
uranium contains as much energy as three million pounds of	
coal, so cheap power can be provided wherever it is required.	
However, the <b>efficiency</b> (28) reached in generating power	
from atomic fuel is not high, namely 40 per cent.	

No wonder, **therefore** (29), that scientists all over the world are doing their best to find more efficient ways of generating electricity directly from the fuel (without using **intermediate cycles** (30)). They already **succeeded in** (31) developing some processes, which are much more efficient, as high as 80 per cent, and in creating a number of **device** (32) capable of giving a higher efficiency. Scientists **are hard at work** (33) trying to solve all these and many other problems.

**Task 2. Answer the questions:**

1. What are main sources of power?
2. Where do we use electricity produced by these ways?
3. What are the alternative sources of power? Why?
4. What can you say about using of atomic fuel?
5. What is a scientists' contribution in searching of more efficient ways of generating electricity?

**Task 3. Translate into Ukrainian:**

1. The industrial progress of mankind;
2. heating and lightening system;
3. burning of fossil fuels;
4. to operate internal and external-combustion engines;
5. to actuate generators;
6. to produce electricity;
7. steam of water turbines;
8. generation of electricity;
9. world resources of fossil fuels;
10. resources are not everlasting;
11. hydroelectric plants;
12. small fraction of;
13. energy of hot water;
14. heating and hot water supply;
15. oceans tides;
16. unlimited source;
17. atomic fuel;
18. scientists are hard at work;
19. more efficient;
20. intermediate cycles.

**Task 4. Translate into English:**

1. Викопне паливо; 2. двигун внутрішнього та зовнішнього горіння; 3. з іншого боку; 4. морський приплив; 5. гідроелектростанція; 6. робити все залежне від себе; 7. невтомно працювати; 8. проміжний цикл; 9. атомне паливо; 10. приводити в дію генератор; 11. світові запаси; 12. невелика частка енергії; 13. необмежене джерело; 14. людство; 15. лінія передачі.

**Task 5. Decide whether the following statements are true or false.**

T      F

1. We use energy of hot water to produce electricity.
2. The mankind utilizes electrical power only in industrial needs.
3. Atomic fuel gives the highest efficiency in generating electricity.
4. There are unlimited reserves of all kinds of fuel on the Earth.
5. Electricity that is produced by generators then flows through transmission lines to houses, industrial plants, enterprises, etc.
6. Power of wind is the only a practically unlimited source.
7. Scientists have developed a great amount of devices that give them opportunity to continue their researches in the field of efficient use of electricity.
8. People know that uranium contains more energy than any other fossil fuel.
9. The energy of the Sun is used not only in production of electricity.
10. Scientists are trying to create a new way of generation of energy where they can escape intermediate cycles.

**Task 6. Complete the sentences with appropriate words and word combinations from the text.**

1. People use energy for ....., ....., ....., and .....

2. Fossil fuels such as ....., ....., and ..... provide most world's electrical power and satisfy almost all world's energy demands.
3. Modern science knows many sources of power, they are ....., ....., ....., and .....
4. .... of atomic fuel in generating energy is ..... than that of .....
5. The most efficient way of ..... directly from the fuel is without using .....

## TEXT 12

### OTHER GENERATING SOURCES

<p><b>Geothermal power (1)</b> comes from heat energy buried (1)  beneath the surface of the earth. In some areas of the country, (2)  magma (molten matter under the earth's crust) flows close (3)  enough to the surface of the earth <b>to heat underground</b> (4)  <b>water into steam (2)</b>, which can be <b>tapped for use (3)</b> at (5)  <b>steam-turbine plants (4)</b>. This energy source generates less (6)  than 1% of the electricity in the country. (7)</p> <p><b>Solar power (5)</b> is <b>derived from</b> the energy of the sun. (8)  However, the sun's energy is not available full-time and it <b>is</b> (9)  <b>widely scattered (6)</b>. The processes used to produce (10)  electricity using the sun's energy have historically been more (11)  expensive than using <b>conventional (7)</b> fossil fuels. (12)</p> <p><b>Photovoltaic conversion (8)</b> generates electric power directly (13)  from the light of the sun in a <b>photovoltaic (solar) cell (9)</b>. (14)  Solar-thermal electric generators use the radiant energy from (15)</p>	<p>(1)</p> <p>(2)</p> <p>(3)</p> <p>(4)</p> <p>(5)</p> <p>(6)</p> <p>(7)</p> <p>(8)</p> <p>(9)</p> <p>(10)</p> <p>(11)</p> <p>(12)</p> <p>(13)</p> <p>(14)</p> <p>(15)</p>
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<p>the sun to produce steam <b>to drive turbines (10)</b>. Less than 1% of the nation's electricity is based on solar power.</p>	<p>(16) (17)</p>
<p><b>Wind power (11)</b> is derived from the conversion of the energy contained in wind into electricity. Wind power like the sun, is usually an expensive source of producing electricity, and is used for less than 1% of the nation's electricity. A wind turbine <b>is similar to (12)</b> a typical wind mill.</p>	
<p><b>Biomass (13)</b> (wood, municipal solid <b>waste (garbage) (14)</b>, and agricultural waste, such as <b>corn cobs (15)</b> and <b>wheat straw (16)</b>, are some other energy sources for producing electricity. These sources replace fossil fuels in the boiler. The combustion of wood and waste creates steam that is typically used in <b>conventional steam-electric plants (17)</b>. Biomass accounts for less than 1% of the electricity generated in the United States.</p>	

### TEXT 13

### METERS

**Task 1. Read the text. Fill in the lines marked with numbers in right column of the table with that are equivalents of English words and word combinations marked in left part of the text.**

1. Брати до уваги, 2. вимірювати, 3. струм, 4. омметр, 5. бути під'єднаним до, 6. коло, 7. розмір (значення) електричної напруги, 8. позитивно заряджена клемма, 9. розмір (значення) електричного опору, 10. вольтметр, 11. зчитувати (вимірювати), 12. з одної сторони, 13. негативно заряджена клемма, 14. постійний, 15. послідовно, 16. кут відхилення, 17. постійний струм, 18.

катушка, 19. шкала, 20. гальванометр, 21. стрілка, 22. відхилення, 23. різниця потенціалів, 24. виявити, 25. порушувати, 26. електрична енергія, 27. електрична сила

One of important things that an engineer should <b>take into consideration (1)</b> is “how much”. How much <b>current (2)</b> is this <b>circuit (3)</b> carrying? What is <b>value of voltage (4)</b> in the circuit? What is <b>value of resistance (5)</b> ? In fact, <b>to measure (6)</b> the current and the voltage is not difficult at all. One should connect an <b>ammeter (7)</b> or a <b>voltmeter (8)</b> to the circuit and <b>read off (9)</b> the amperes and volts.	(1) (2) (3) (4) (5) (6) (7)
The ammeter is used to measure the value of current. When the ammeter is used, the circuit should be open <b>at one point (10)</b> and the terminals of the meter should <b>be connected to (11)</b> it. One should take into consideration that the <b>positive terminal (12)</b> of the meter is connected to the positive terminal of the source, the <b>negative terminal (13)</b> □ to the negative terminal of the source.	(8) (9) (10) (11) (12) (13) (14)
The ammeter should be connected <b>in series (14)</b> . The readings on the scale show the measured value.	(15) (16)
Common ammeters for <b>d.c. (15)</b> measurements are the ammeters of the magnetoelectric system. In an ammeter of this type <b>an armature coil (16)</b> rotates between the poles of a <b>permanent (17)</b> magnet; but the coil turns only through a small angle. The greater the current in the coil, the greater is the force, and, therefore, greater the <b>angle of rotation (18)</b> of the armature. The <b>deflection (19)</b> is measured by means of a <b>pointer (20)</b> connected to the armature and the <b>scale (21)</b> of the meter reads directly in amperes.	(17) (18) (19) (20) (21) (22) (23) (24) (25)

<p>When the currents to be measured are very small, one should use a <b>galvanometer (22)</b>. Some galvanometers <b>detect (23)</b> and measure currents as small as <math>10^{-11}</math> of an ampere per 1 mm of scale.</p> <p>A voltmeter is a device to be used for measuring the <b>potential difference (24)</b> between any two points in a circuit. The voltmeter has armatures that move when an electric current is sent through their coils. The deflection, like that of an ammeter, is proportional to the current flowing through the armature coil.</p> <p>A voltmeter must have a very high <b>resistance (25)</b> since it passes only very small currents, which will not <b>disturb (26)</b> the rest of the circuit. An ammeter, on the other hand, must have a low resistance, since all the current must pass through it. In actual use the ammeter is placed in series with that part of the circuit where the voltage is to be measured.</p> <p>In addition to instruments for measuring current and voltage, there are also devices for measuring <b>electric power (27)</b> and <b>energy (28)</b>.</p>	(26)
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**Task 2. Decide whether the following statements are true or false.**

T    F

1. When the ammeter is used, the circuit should be closed at one point and the terminals of the meter should be connected to it.
2. A voltmeter is a device to be used for creating the potential difference between any two points in a circuit.

3. The voltmeter has armors that move when an electric current is sent through their coils.
4. A voltmeter must have a very high conductivity.
5. A galvanometer is a device for detection and determination of a very small currents.
6. An ammeter must have a high resistance.
7. The deflection of an ammeter is proportional to the current flowing through the armature coil
8. To measure the value of current, the value of voltage and the value of resistance we use different instruments, and it's not easy to do.

**Task 3. Find the definitions of the following words in the right column**

- |                   |   |
|-------------------|---|
| 1. armature       | a) a flow of electric charge through a conductor  |
| 2. circuit        | b) any sensitive instrument for detecting or measuring small electric currents                    |
| 3. current        | c) the opposition to a flow of electric current through a circuit component, medium, or substance |
| 4. electric power | d) an electromotive force or potential difference expressed in volts                              |
| 5. galvanometer   | e) to estimate or determine   |
| 6. in series      | f) the protective outer covering  |
| 7. resistance     | g) a point at which current enters or leaves an electrical device, such as a battery or a circuit |
| 8. terminal       | h) one by one   |

9. to measure i) a measure of the rate of doing work expressed as the work done per unit time
- 10.voltage j) the round path that an electric current travels

**Task 4. Find the synonyms of the following words in the right column**

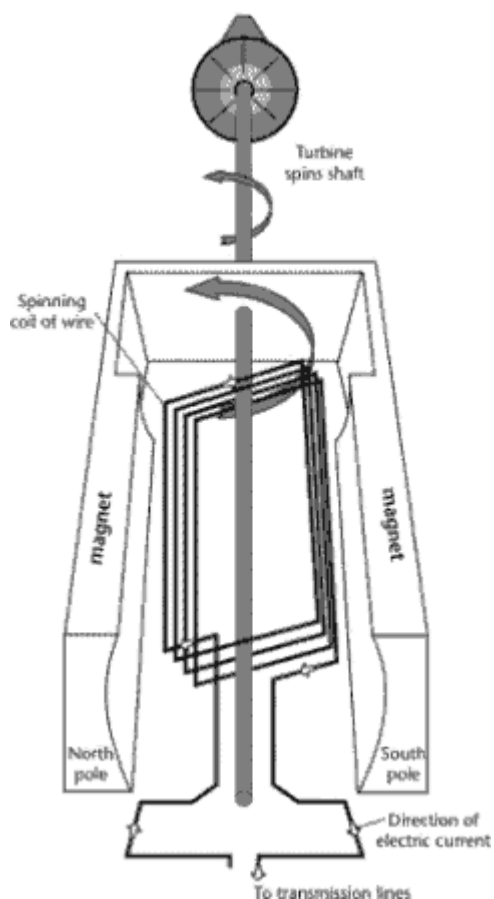
- |               |                |
|---------------|----------------|
| 1. rotate     | a) armour      |
| 2. measure    | b) device      |
| 3. armature   | c) go on       |
| 4. connect    | d) bobbin      |
| 5. value      | e) corner      |
| 6. coil       | f) turn around |
| 7. instrument | g) deviation   |
| 8. pass       | h) attach      |
| 9. angle      | i) meaning     |
| 10.deflection | j) evaluate    |

**TEXT 14**

**HOW IS ELECTRICITY GENERATED?**

**Task 1. Read the text. Complete the blanks in the right column with the appropriate words from left column.**

## TURBINE GENERATOR



An electric generator is a \_\_\_\_\_ for converting mechanical energy into electrical energy. The process \_\_\_\_\_ the relationship between magnetism and electricity. When a \_\_\_\_\_ or any other electrically conductive material moves across a magnetic \_\_\_\_\_, an electric current occurs in the wire. The large generators used by the \_\_\_\_\_ utility industry have a

- (1) constitutes
- (2) current
- (3) device
- (4) electric
- (5) field
- (6) is based on
- (7) it
- (8) magnet
- (9) magnet
- (10) power
- (11) wire

stationary conductor. A \_\_\_\_\_ attached to the end of a rotating shaft is positioned inside a stationary conducting ring that is wrapped with a long, continuous piece of wire. When the \_\_\_\_\_ rotates, it induces a small electric current in each section of wire as \_\_\_\_\_ passes. Each section of wire \_\_\_\_\_ a small, separate electric conductor. All the small currents of individual sections add up to one \_\_\_\_\_ of considerable size. This current is what is used for electric \_\_\_\_\_.

**Task 2. Give Ukrainian equivalents to the following words and word combinations.**

1. electric generator, 2. device, 3. mechanical energy, 4. magnetism, 5. electricity, 6. electrically conductive material, 7. an electric current occurs in the wire, 8. stationary conductor, 9. rotating shaft, 10. conducting ring, 11. is wrapped with a long, continuous piece of wire, 12. individual sections add up to one current of considerable size.

## Vocabulary

AC transmission	передача змінного струму
alkali metals	лужний метал
alternating current (AC)	змінний струм
ammeter	омметр
an armature coil	катушка
angle of rotation	кут обертання
anode	анод
arc light	дугова лампа
armour	обплетення провода
arrangement	монтаж, установлення
at one point	з одного боку
atomic fuel	атомне паливо
atomic particles	елементарна частка
attribute	властивість, ознака
axis	вісь
battery	батарея
bobbin	катушка
by means of something	за допомогою чогось
capacitors	конденсатор



cathode	катод
characteristic attribute	характерна риса; особливість, властивість
circuit.	коло
coal	(кам'яне) вугілля
coil	котушка
commercially viable	вигідний з комерційної точки зору
compass	компас
condenser	конденсатор; конденсор
conventional processes	умовний процес
conversion	обертання; перетворення; трансформування
cost-effective	прибутковий
coulomb	кулон
current flow	електричний струм
deflection	відхилення
density of a material	питома вага (щільність) матеріалу
development	розвиток
deviation	відхилення
device	пристрій; механізм, прилад; винахід

direct current (DC)	постійний струм
directions	напрямок
distinctive feature	характерна риса; особливість
efficiency	ефективність; віддача, корисна дія; коефіцієнт корисної дії
electric cell	електричний елемент
electric current	електричний струм
electric generating machine	електричний генератор
electric generating station	електростанція
electric generators	електрогенератор
electric motors	електромотор
electric utility plants	електроенергетична компанія
electricity	електрика
electricity generation	виробництво електрики
electrode	електрод
electrolytic cell	гальванічний елемент; електролітична ячейка
electromagnetic induction	електромагнетична індукція
electron	електрон
electron orbit	орбіта електрона

electroscope	електроскоп
emission of electrons	еманація електронів
employee	працівник, робітник
employer	наймач, роботодавець
empty tube	порожня трубка
energy	енергія
energy emitted from	енергія вивільнена з
energy possessed by the atom	енергія, що знаходиться в атомі
external-combustion engines	двигун зовнішнього згорання
filament	нитка розжарення
flow of electrons	потік електронів
force	сила; прискорювати, пришвидшувати (рух) ; додавати обертів (машині, мотору)
force surrounding	сила, що знаходиться навколо чогось
fossil fuels	викопне паливо
fraction of the power	доля (частина) енергії
frequency of the light	частота світла
frequency of the transmission current	частота передачі струму
galvanometer	гальванометр

gauss	гаусс
generation of electric power	виробництво електричної енергії
generator	генератор
heating and lightening system	система опалення та освітлення
however	проте, однак; незважаючи на це
hydrogen bomb	воднева бомба
impact	вплив
in series	один за одним
in somebody's honor	у чиюсь честь
incandescent light bulbs	електрична лампа розжарення
incident light	падаюче світло
induction motor	асинхронний (електро)двигун
industrial plants	промислове підприємство
industrial progress	промисловий прогрес
inert chambers	інертна камера
installation	установлення, розміщення; монтаж; інсталяція
intermediate cycles	проміжний цикл
internal-combustion engines	двигун внутрішнього згорання
invention	винахід

inventor	винахідник
ion	іон
kerosene lamps	газова лампа
light bulb	електрична лампочка
lightning rods	гromовідвід
lodestone	природний магніт; магнітний залізняк
luminous	той, що світиться
machines	машина, механізм
magnetic field	магнітне поле
magnetic force	сила магнітного поля
magnetism	магнетизм
magnetized needle	намагнічена стрілка
meaning	значення
mechanical energy	механічна енергія
melting point	точка плавління
miner's safety lamp	безпечний рудниковий ліхтар
molecules	молекули
motor	двигун
moving charged particle	заряджена частинка, що рухається

natural gas	природний газ
navigator	мореплавець
negative terminal	негативно заряджена клемма
negatively charged particle	негативно заряджена частинка
neutron	нейтрон
non-renewable	не відновлюваний
nucleus	ядро
obstacle	перепона, перешкода, завада
oceans tides	морський приплив і відплив
oil	нафта
opposites	протилежний
patent	патент
permanent magnet	постійний магніт
photo cathodes	фотокатод
photoelectric cell	фотоелектричний елемент
photoelectric current	фотоелектричний струм
photoemission	фотоемісія
photoemissive cell	фотоелемент з зовнішнім фотоефектом
planetary system	сонячна система; планетна система

pointer	стрілка
positive terminal	позитивно заряджена клемма
positively charged particles	позитивно заряджені часточки
potential difference	різниця потенціалів
primary source	головне джерело
property	властивість, якість
protons	протон
quality	властивість, якість
rate of electron	швидкість електрону
renewable	відновлювальний
research	дослідження
residual magnetism	залишковий магнетизм
resistant conductor	міцний провід
scale	шкала
secondary energy source	вторинні джерела енергії
shell	оболонка; зовнішня частина машини
significant progress	значний прогрес
stiff wire	негнучкий дріт
storage jar	сосуд для зберігання чогось

strength of a material	опір матеріалів
strip of charcoal	стрічка деревинного вугілля
strong force	значна сила
successful working invention	успішно працюючий винахід
surface	поверхня
telegraph	телеграф
the number of electrons released	кількість електронів, що було вивільнено
the release of dynamic electricity	вивільнення активної електрики
therefore	тому, отже
thermal energy	теплова (термічна) енергія
to actuate generators	приводити в дію генератори
to apply steady force to	застосовувати постійну силу до
to arrange	приводити до ладу; розташовувати
to attach	приєднуватися
to attract	притягувати
to be balanced	бути зрівноваженим
to be based on	базуватися на
to be connected to	бути приєднаним до
to be converted into	бути перетвореним у



to be electrified	бути наелектрофікованим
to be everlasting	бути постійним
to be fascinated by	бути зачарованим
to be hard at work	невтомно працювати
to be interested in	бути зацікавленим у
to be obtained	бути отриманим
to be required	бути необхідним
to be superior to	бути кращим ніж
to be transmitted by	бути переданим через
to began to glow	почати розварюватися
to burn brighter	горіти яскравіше
to calculate	обчислювати, підраховувати
to cause an approach	викликати наближення
to come into existence	утворюватися, виникати
to concentrate on	зосереджувати(ся) на
to conduct electricity	проводити електричний струм
to constitute	утворювати; складати; встановлювати, засновувати
to contribute to	робити вклад до
to create	створювати

to degauss	розмагнічувати
to demagnetize	розмагнічувати
to detect	виявляти
to determine	визначати; встановлювати
to direct the operation	керувати роботою
to discover conductivity	відкрити електропровідність
to disturb	турбувати, непокоїти
to evaluate	оцінювати; визначати кількість
to excite	викликати
to exert an opposing force on	викликати силу, що чинить опір
to experience a force	відчувати силу
to face	зустрічатися
to find out	з'ясувати
to flow	ринутися; линутися потоком
to focus on	зосередитися на
to gain	одержувати
to generate electricity	виробляти електричний струм
to glow hot	розжарюватися до червоного кольору
to last longer	вистачати на довше

to lose	втрачати
to measure	вимірювати
to object	заперечувати
to operate	керувати
to oppose a separation	чинити опір поділу
to perform many experiments	проводити експерименти
to point	вказувати
to possess	володіти
to produce	виробляти
to prove	доводити
to provide electricity to	забезпечувати електрикою
to pull	тягти
to push	штовхати
to read off	зчитувати
to release	вивільняти
to remove	пересувати
to repel	відштовхувати
to rotate	обертати(ся)
to save	зберігати
to spin	крутити(ся), вертіти(ся)

to state	встановлювати, точно визначати
to strike by	вдарятися
to succeeded in	мати успіх, висунутися
to support	підтримувати
to take into consideration	брати до уваги
to transmit	передавати
to turn	обертити(ся)
transferring	перенесення
transformer	трансформатор
transmission lines	лінія передачі
trials	випробування; дослід, проба
uncharged particles	незаряджена часточка
unit of electrical charge	одиниця електричного заряду
utilizing hot underground water	використання гарячих підземних вод
value of resistance	значення опору
value of voltage	значення напруги
voltaic pile	електрина дуга
voltmeter	вольтметр
water supply	водопостачання

water wheels	водне колесо
waterfalls	водопад
wood-burning or coal-burning stoves	піч для згорання дерева або вугілля

### Словник

анод	anode
асинхронний (електро)двигун	induction motor
атомне пальне	atomic fuel
базуватися на	to be based on
батарея	battery
безпечний рудниковий ліхтар	miner's safety lamp
брати до уваги	to take into consideration
бути зацікавленим у	to be interested in
бути зачарованим	to be fascinated by
бути зрівноваженим	to be balanced
бути кращим ніж	to be superior to
бути наелектрофікованим	to be electrified
бути необхідним	to be required
бути отриманим	to be obtained

бути переданим через	to be transmitted by
бути перетвореним у	to be converted into
бути постійним	to be everlasting
бути приєднаним до	to be connected to
вдарятися	to strike by
вивільнення активної електрики	the release of dynamic electricity
вивільняти	to release
вигідний з комерційної точки зору	commercially viable
визначати; встановлювати	to determine
викликати	to excite
викликати наближення	to cause an approach
викликати силу, що чинить опір	to exert an opposing force on
виробне паливо	fossil fuels
використання гарячих підземних вод	utilizing hot underground water
вимірювати	to measure
винахід	invention
винахідник	inventor
випробування; дослід, проба	trials
виробляти	to produce
виробляти електричний струм	to generate electricity

виробництво електрики	electricity generation
виробництво електричної енергії	generation of electric power
вистачати на довше	to last longer
виявляти	to detect
відкрити електропровідність	to discover conductivity
відновлювальний	renewable
відхилення	deflection
відхилення	deviation
відчувати силу	to experience a force
відштовхувати	to repel
вісь	axis
вказувати	to point
властивість, ознака	attribute
властивість, якість	property
властивість, якість	quality
водне колесо	water wheels
воднева бомба	hydrogen bomb
водопад	waterfalls
водопостачання	water supply
володіти	to possess

вольтметр	voltmeter
вплив	impact
встановлювати, точно визначати	to state
вторинні джерела енергії	secondary energy source
втрачати	to lose
газова лампа	kerosene lamps
гальванічний елемент; електролітична ячейка	electrolytic cell
гальванометр	galvanometer
гаусс	gauss
генератор	generator
головне джерело	primary source
горіти яскравіше	to burn brighter
громовідвід	lightning rods
двигун	motor
двигун внутрішнього згорання	internal-combustion engines
двигун зовнішнього згорання	external-combustion engines
доводити	to prove
доля (частина) енергії	fraction of the power
дослідження	research



дугова лампа	arc light
електрика	electricity
електрина дуга	voltaic pile
електрична лампа розжарення	incandescent light bulbs
електрична лампочка	light bulb
електричний генератор	electric generating machine
електричний елемент	electric cell
електричний струм	current flow
електричний струм	electric current
електрогенератор	electric generators
електрод	electrode
електроенергетична компанія	electric utility plants
електромагнетична індукція	electromagnetic induction
електромотор	electric motors
електрон	electron
електроскоп	electroscope
електростанція	electric generating station
елементарна частка	atomic particles
еманація електронів	emission of electrons
енергія	energy

енергія вивільнена з	energy emitted from
енергія, що знаходиться в атомі	energy possessed by the atom
ефективність; віддача, корисна дія; коефіцієнт корисної дії	efficiency
з одного боку	at one point
з'ясувати	to find out
за допомогою чогось	by means of something
забезпечувати електрикою	to provide electricity to
залишковий магнетизм	residual magnetism
заперечувати	to object
заряджена частинка, що рухається	moving charged particle
застосовувати постійну силу до	to apply steady force to
зберігати	to save
змінний струм	alternating current (AC)
значення	meaning
значення напруги	value of voltage
значення опору	value of resistance
значна сила	strong force
значний прогрес	significant progress
зосереджувати(ся) на	to concentrate on

зосередитися на	to focus on
зустрічатися	to face
зчитувати	to read off
інертна камера	inert chambers
іон	ion
кам'яне вугілля	coal
катод	cathode
керувати	to operate
керувати роботою	to direct the operation
кількість електронів, що було вивільнено	the number of electrons released
коло	circuit.
компас	compass
конденсатор	capacitors
конденсатор; конденсор	condenser
катушка	an armature coil
катушка	bobbin
катушка	coil
крутити(ся), вертіти(ся)	to spin
кулон	coulomb
кут обертання	angle of rotation

лінія передачі	transmission lines
лужний метал	alkali metals
магнетизм	magnetism
магнітне поле	magnetic field
мати успіх, висунутися	to succeeded in
машина, механізм	machines
механічна енергія	mechanical energy
міцний провід	resistant conductor
молекули	molecules
монтаж, установлення	arrangement
мореплавець	navigator
морський приплив і відплив	oceans tides
наймач, роботодавець	employer
намагнічена стрілка	magnetized needle
напрямок	directions
нафта	oil
не відновлюваний	non-renewable
невтомно працювати	to be hard at work
негативно заряджена клема	negative terminal
негативно заряджена частинка	negatively charged particle

негнучкий дрiт	stiff wire
незаряджена часточка	uncharged particles
нейтрон	neutron
нитка розжарення	filament
обертання; перетворення; трансформування	conversion
обертати(ся)	to rotate
обертити(ся)	to turn
оболонка; зовнiшня частина машини	shell
обплетення провoда	armour
обчислювати, пiдраховувати	to calculate
одержувати	to gain
один за одним	in series
одиниця електричного заряду	unit of electrical charge
омметр	ammeter
опiр матерiалiв	strength of a material
орбiта електрона	electron orbit
оцiнювати; визначати кiлькiсть	to evaluate
падаюче свiтло	incident light
патент	patent
передавати	to transmit

передача змінного струму	AC transmission
перенесення	transferring
перепона, перешкода, завада	obstacle
пересувати	to remove
питома вага (щільність) матеріалу	density of a material
підтримувати	to support
піч для згорання дерева або вугілля	wood-burning or coal-burning stoves
поверхня	surface
позитивно заряджена клема	positive terminal
позитивно заряджені часточки	positively charged particles
порожня трубка	empty tube
постійний магніт	permanent magnet
постійний струм	direct current (DC)
потік електронів	flow of electrons
почати розварюватися	to began to glow
працівник, робітник	employee
прибутковий	cost-effective
приводити в дію генератори	to actuate generators
приводити до ладу; розташовувати	to arrange
приєднуватися	to attach

природний магніт; магнітний залізняк	lodestone
природний газ	natural gas
пристрій; механізм, прилад; винахід	device
притягувати	to attract
проводити експерименти	to perform many experiments
проводити електричний струм	to conduct electricity
промислове підприємство	industrial plants
промисловий прогрес	industrial progress
проміжний цикл	intermediate cycles
проте, однак; незважаючи на це	however
протилежний	opposites
протон	protons
ринуться; линуть потоком	to flow
різниця потенціалів	potential difference
робити вклад до	to contribute to
розвиток	development
розжарюватися до червоного кольору	to glow hot
розмагнічувати	to degauss
розмагнічувати	to demagnetize
сила магнітного поля	magnetic force

сила, що знаходиться навколо чогось	force surrounding
сила; прискорювати, пришвидшувати (рух) ; додавати обертів (машині, мотору)	force
система опалення та освітлення	heating and lightening system
сонячна система; планетна система	planetary system
сосуд для зберігання чогось	storage jar
створювати	to create
стрілка	pointer
стрічка деревинного вугілля	strip of charcoal
телеграф	telegraph
теплова (термічна) енергія	thermal energy
той, що світиться	luminous
тому, отже	therefore
точка плавління	melting point
трансформатор	transformer
турбувати, непокоїти	to disturb
тягти	to pull
у чийсь честь	in somebody's honor
умовний процес	conventional processes
успішно працюючий винахід	successful working invention



установлення, розміщення; монтаж; інсталяція	installation
утворювати; складати; встановлювати, засновувати	to constitute
утворюватися, виникати	to come into existence
фотоелектричний елемент	photoelectric cell
фотоелектричний струм	photoelectric current
фотоелемент з зовнішнім фотоелементом	photoemissive cell
фотоемісія	photoemission
фотокатод	photo cathodes
характерна риса; особливість	distinctive feature
характерна риса; особливість, властивість	characteristic attribute
частота передачі струму	frequency of the transmission current
частота світла	frequency of the light
чинити опір поділу	to oppose a separation
швидкість електрону	rate of electron
шкала	scale
штовхати	to push
ядро	nucleus

### **Список використаної літератури**

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