

Unit 2 The Basics of Electrical Engineering

Task 1 Match English words with their Polish equivalents.

- | | |
|-----------------------------|--------------------------------|
| 1. controller | a) kabel koncentryczny |
| 2. resistor | b) sterownik |
| 3. capacitor | c) cewka indukcyjna |
| 4. inductor | d) światłowód |
| 5. semiconductor transistor | e) opornik |
| 6. coax cable | f) kondensator |
| 7. optical fibre | g) tranzystor półprzewodnikowy |

Reading

Task 2

a) Read the first paragraph about Electrical engineering and complete the gaps with appropriate forms of the words in brackets.

Electrical engineering is a field of engineering that 1) (GENERAL) deals with the study and 2) (APPLY) of electricity, electronics and electromagnetism. It may include electronic engineering. Electrical engineering is considered to deal with the problems associated with large-scale electrical systems such as power 3) (TRANSMIT) and motor control, whereas electronic engineering deals with the study of small-scale electronic systems including computers and integrated circuits. More recently, the 4) (DISTINCT) has become blurred by the 5) (GROW) of power electronics.

Adapted from <http://en.wikipedia.org/wiki>

b) Read the next part of the text and complete the paragraphs with names of branches of electrical engineering.

Telecommunications engineering, Electronic engineering, Control engineering, Microelectronics engineering, Power engineering, Computer engineering, Signal processing, Instrumentation engineering

Electrical engineering has many sub-disciplines, the most popular of which are listed below.

1. deals with the generation, transmission and distribution of electricity as well as the design of a range of related devices. These include transformers, electric generators, electric motors, high voltage engineering and power electronics.
2. focuses on the modelling of a diverse range of dynamic systems and the design of controllers that will cause these systems to behave in the desired manner. To implement such controllers electrical engineers may use electrical circuits, digital signal processors, microcontrollers and PLCs (Programmable Logic Controllers).
3. involves the design and testing of electronic circuits that use the properties of components such as resistors, capacitors, inductors, diodes and transistors to achieve a particular functionality.
4. deals with the design and microfabrication of very small electronic circuit components for use in an integrated circuit or sometimes for use on their own as a general electronic component. The most common microelectronic components are

semiconductor transistors, although all main electronic components (resistors, capacitors, inductors) can be created at a microscopic level. Nanoelectronics is the further scaling of devices down to nanometre levels.

5. deals with the analysis and manipulation of signals. Signals can be either analogue or digital. For analogue signals, it may involve the amplification and filtering of audio signals for audio equipment or the modulation and demodulation of signals for telecommunications. For digital signals, it may involve the compression, error detection and error correction of digitally sampled signals.

6. focuses on the transmission of information across a channel such as a coax cable, optical fibre or free space. Transmissions across free space require information to be encoded in a carrier wave in order to shift the information to a carrier frequency suitable for transmission, this is known as modulation. Popular analogue modulation techniques include amplitude modulation and frequency modulation.

7. deals with the design of devices to measure physical quantities such as pressure, flow and temperature.

8. deals with the design of computers and computer systems. This may involve the design of new hardware, the design of PDAs or the use of computers to control an industrial plant. Engineers may also work on a system's software.

Adapted from http://en.wikiversity.org/wiki/Introduction_to_Electrical_Engineering

c) Ask your partner four questions based on the text that you have read.

- 1
- 2
- 3
- 4

Task 3 Match the inventions with their inventors.

phonograph, AC motor/asynchronous motor, automatic telegraph, radio frequency oscillators, electrical vote recorder, motion picture camera, remote-control boat, light bulb powered by the electric field surrounding it, insulating tape, incandescent light bulb, bifilar coil

Nikola Tesla	Thomas Edison

Listening

Task 4 Listen to the radio programme about Nikola Tesla and decide whether the sentences are true or false.

Recording from http://www.bbc.co.uk/iplayer/episode/p00lh2jf/Witness_Nikola_Tesla/

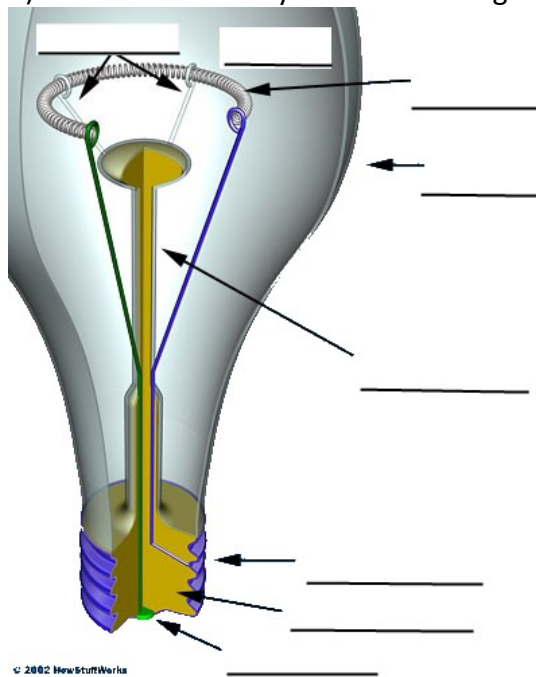
1. Nikola Tesla got the Nobel Prize for Physics in 1915.
2. Tesla came to America from Serbia.
3. Tesla wanted to improve Edison's system by using alternating current instead of direct current.
4. Tesla introduced commutator into the system for sending energy over distance.
5. Tesla competed with Edison for the right to build a nuclear power plant at Niagara Falls.
6. Edison wanted to prove that direct current was dangerous.
7. Thanks to Tesla power can be sent for long distances.
8. Tesla thought Guglielmo Marconi stole his ideas.
9. Tesla did not appreciate the fact he was nominated to the Nobel Prize.
10. Tesla died of an illness carried by pigeons.

Incandescent light bulb

Task 5 a) Match English words with their Polish equivalents.

- | | |
|----------------------------|------------------------|
| 1. bulb | a) żarnik wolframowy |
| 2. inert gas | b) gaz obojętny |
| 3. screw thread contact | c) druty podtrzymujące |
| 4. electrical foot contact | d) izolacja |
| 5. tungsten filament | e) styk |
| 6. support wires | f) bańka |
| 7. glass mount | g) trzonek gwintowany |
| 8. insulation | h) słupek |

b) Use the vocabulary to label the diagram.



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