UNIT 1. HISTORY AND DEFINITION OF ROBOTS

1. Read and memorize the following words and word combinations.

**hardware** — механічна частина, обладнання

**handling (manipulative job functions)** – маніпулювання, функції маніпулювання, транспортування

**to relieve** – звільняти

**load** — вантаж, навантаження

**the necessity of handling heavy loads** – необхідність транспортування важкого вантажу

**to fill the gap –** заповнити прогалину

**to substitute –** заміняти

**special-purpose** — (вузько) спеціальний

**off-the-shelf** (commercially available) automation – серійні засоби автоматизації, що випускаються

**to be reprogrammed –** бути репрограмованим

**handling equipment** – маніпуляційне обладнання

2. Read text A. Try to understand its contents. See notes given below.

Text A

|  |  |
| --- | --- |
| In the fourth century B.S., Aristotle wrote, "if every instrument could accomplish its own work, obeying or anticipating the will of others... if the shuttle could weave and the pick touch the lyre without a hand to guide them, chief workman would not need servants nor masters slaves". | B четвертому столітті до нашої ери Аристотель писав: "якби будь-який інструмент міг виконувати свою власну роботу підпорядковуючись чи випереджаючи волю інших ..., якби човник міг ткати, а медіатор міг торкатися ліри без руки, яке веде його, то майстру не потрібні були б ні помічники, ні підневільні працівники". |

Handling operations occur in practically all production processes. At first they were carried out manually, but then the development of hardware components made it possible to relieve people from the necessity of handling heavy loads.

From this standpoint the industrial robot is not something supernatural. It is only the most perfect form of the technique used in handling processes. Their purpose is not only to substitute or imitate manual actions of human beings, but also to perform production processes more quickly and better than a man.

Robots fill the gap between special-purpose automation and human endeavor. They have demonstrated an ability to perform work that requires simple repetitive motions and, therefore, can relieve human operators from hazardous or monotonous tasks.

Terms like "teachable", and “programme-controlled" often are applied to robots. However, robots are best understood in terms of their real capabilities. Essentially, they are "off-the-shelf" automation. It is the robot's ability to be easily taught or reprogrammed that distinguishes it from other types of automated handling equipment.

Robot is one of the very few Slav words (in this case Czech) borrowed in the different languages. It comes from the Old Slav word "robu", which means a servant. In modern Slav, the word "robotnik" means workman and is linked to the Russian word for work, "rabota".

Notes

**in terms of** — з точки зору

**it is(was)**... that — а саме

**the very** (compare with "very") — саме

3. Characterize the industrial robot choosing the right word.

There are different terms which can be (application, applied) to robots. The robot is called (teacher's, teachable). The robot is also called (program-controlled, program-controlling). The word "robot" means (servant, service). The robot must perform (production, productivity) processes better and faster than a man. The robot's (able, ability) to be retaught and reprogrammed distinguishes it from other types of (automatics, automated) handling equipment. The robot is the most perfect form of (handle, handling) means. Industrial robots are used to (substitute, substitution) manual actions of a human being. The robot must (imitation, imitate) the manual actions of human beings.

4. Combine the sentences in lists A and В into logical units. Complete the sentences with one of the words given below.

|  |  |
| --- | --- |
| **А**  1) Industrial robot is the most perfect engineering means for handling.  2) Robots can be easily taught or reprogrammed.  3) The robot performs actions according to a certain programme.  4) The term "programme-controlled" is often applied to robots.  5) Handling operations can be carried out by hand. | **В**  a) That's why they differ from other types of automated ... .  b) Therefore their aim is to perform ... .  c) Thus we can say it works ... .  d) So it can be called ... .  e) Hence they can be called ... . |

production processes better than a man, handling equipment, manual operations, automatically, a program­mable device

5. Name; a) the possible ways of describing the robot's characteristics — use: "can be called…".

E.g. The robot can be called a programmable device.

|  |  |
| --- | --- |
| Робот може бути названий | програмним пристроєм.  автоматичним пристроєм.  пристроєм, який навчає.  маніпуляційним пристроєм. |

b) the functions performed by the robot — use: "the purpose of the robot is...".

E.g. The purpose of the robot is to perform human operations.

|  |  |
| --- | --- |
| Мета робота - | виконувати роботу людини.  звільняти людину від маніпулювання важкими вантажами.  виконувати виробничі процеси швидше і краще ніж людина.  заміняти людину на небезпечних операціях. |

6. Speak on the problem of robot’s application. The advantages of robot’s application are:

a. the operator needs no computer experience, makes no complex calculations;

b. increased productivity and product quality;

c. fast, easy installation;

d. reduced energy consumption.

Text В

Industrial robots are helping to eliminate the hazards involved when workers put their fingers in metalworking presses, are subjected to long exposures of toxic materials, must load and unload parts from processing furnaces, or lift heavy loads. According to GOST 25686-85 the industrial robot is defined as "an automatic machine, stationary or mobile, comprising actuator in the form of a manipulator which has some degrees of motion and a reprogrammable device of program control to perform movement and control functions in the production process".

The industrial robot as considered here, is a general-purpose, programmable, parts-handling machine that will also control and synchronize the equipment or production machinery with which it works. As with a human it can be "taught" a job, can "remember" instructions it has been given, can be "retaught" when the job content changes, and can be transferred to a different job when the first job ends.

Today, more than 100 companies around the world produce industrial robots and several thousand robots have been installed in factories in our country and other countries.

Industrial robots are powerful tools for increasing productivity and profitability and for solving problems of worker safety and poor working conditions and they are available now in a wide variety of shapes, sizes and capabilities.

**Notes**

**to eliminate –** усувати

**to comprise actuator –** містити привід

**part** — деталь

**degree of motion** — ступінь рухливості

**device** — пристрій

**general purpose** (versatile) — тут широко універсальний

**programmable machine** — програмувальний пристрій, пристрій, що програмує

**production machinery** — виробниче устаткування

**reteach** – перенавчати

**productivity** – продуктивність

worker safety – безпека робітників

**working conditions** — умови праці

7. Translate the following definitions and memorize them.

Robot: A mechanical device which can be programmed to perform some task of manipulation or movement under automatic control.

Industrial Robot: An automatic machine, stationary or mobile, comprising actuator in the form of a manipulator which has some degrees of motion and a reprogrammable device of program control to perform movement and control functions in the production process.

Load: The weight (force) applied to the end of the robot arm.

Hazard: A condition or a changing set of circumstances that presents a potential for damage.

8. Make up a summary.

9. Give your opinion on the problem given below.

Industrial robots are available now in a wide variety of shapes, sizes and capabilities.