I. ***Read and translate the text, paying attention to the new words below. Also, answer the questions after the text.***

AUTOMATION

Automation is the system of manufacture performing certain tasks, previously done by people, by machines only. The sequences of operations are controlled automatically. The most familiar example of a highly automated system is an assembly plant for automobiles or other complex products.

The term automation is also used to describe nonmanufacturing systems in which automatic devices can operate independently of human control. Such devices as automatic pilots, automatic telephone equipment and automated control systems are used to perform various operations much faster and better than could be done by people.

Automated manufacturing had several steps in its development. Mechanization was the first step necessary in the development of automation. The simplification of work made it possible to design and build machines that resembled the motions of the worker. These specialized machines were motorized and they had better production efficiency.

Industrial robots, originally designed only to perform simple tasks in environments dangerous to human workers, are now widely used to transfer, manipulate, and position both light and heavy work pieces performing all the functions of a transfer machine.

In the 1920s, the automobile industry for the first time used an integrated system of production. This method of production was adopted by most car manufacturers and became known as Detroit automation.

The feedback principle is used in all automatic-control mechanisms when machines have ability to correct themselves. The feedback principle has been used for centuries. An outstanding early example is the flyball governor, invented in 1788 by James Watt to control the speed of the steam engine. The common household thermostat is another example of a feedback device.

Using feedback devices, machines can start, stop, speed up, slow down, count, inspect, test, compare, and measure. These operations are commonly applied to a wide variety of production operations.

Computers have greatly facilitated the use of feedback in manufacturing processes. Computers gave rise to the development of numerically controlled machines. The motions of these machines are controlled by punched paper or magnetic tapes. In numerically controlled machining centres, machine tools can perform several different machining operations.

More recently, the introduction of microprocessors and computers have made possible the development of computer-aided design and computer-aided manufacture (CAD and CAM) technologies. When using these systems a designer

draws a part and indicates its dimensions with the help of a mouse, light pen, or other input device. After the drawing has been completed, the computer auto matically gives the instructions that direct a machining centre to machine the part.

Another development using automation are the flexible manufacturing systems (FMS). A computer in FMS can be used to monitor and control the operation of the whole factory.

Automation has also had an influence on the areas of the economy other than manufacturing. Small computers are used in systems called word processors, which are rapidly becoming a standard part of the modern office. They are used to edit texts, to type letters and so on

Many industries are highly automated or use automation technology in some part of their operation. In communications and especially in the telephone industry dialling and transmission are all done automatically. Railways are also controlled by automatic signalling devices, which have sensors that detect carriages passing a particular point. In this way the movement and location of trains can be monitored.

Not all industries require the same degree of automation. Sales, agriculture, and some service industries are difficult to automate, though agriculture industry may become more mechanized, especially in the processing and packaging of foods.

The automation technology in manufacturing and assembly is widely used in car and other consumer product industries.

Nevertheless, each industry has its own concept of automation that answers its particular production needs.

Words to the text

Automation – автоматизация;

Manufacture – производство; previously – ранее;

Sequences of operations – последовательность действий;

Assembly plant – сборочный завод;

Nonmanufacturing – не относящийся к обрабатывающей промышленности;

Automated control systems – автоматизированная система управления;

To resemble – походить, иметь сходство;

Workpieces – детали;

Transfer machine – 1) многопозиционный автомат; 2) станочная линия;

Integrated system – 1) встроенная система; 2) комплексная система; 3) система в интегральном исполнении;

Feedback – обратная связь;

Device – устройство, приспособление; механизм; аппарат, машина, прибор;

To apply –применять к (чему-л.); использовать, употреблять для (чего-л.);

Facilitate – облегчать; содействовать; способствовать; помогать, продвигать;

Punched paper tape – перфорированная бумажная лента, бумажная перфолента;

Computer-aided design (CAD) – автоматизированное проектирование;

Computer-aided manufacturing (CAM) – 1) автоматизированное производство; 2) автоматизация производственных процессов;

Dimension – измерение, размеры;

Flyball governor – центробежный регулятор;

Flexible manufacturing systems (FMS) – гибкие производственные системы;

To detect – замечать, открывать, обнаруживать;

To require – нуждаться (в чём-л.); требовать (чего-л.).

Answer the questions:

1. What is automation?

2. What is the most famous example of a highly automated system?

3. When did the automotive industry first start using an integrated system of production?

4. What can machines do using feedback devices?

5. Do all industries require the same degree of automation?

II. ***Put the proper words from the box into sentences.***

1. The sequences of ... are controlled automatically.
2. The term ... is also used to describe nonmanufacturing systems in which automatic devices can operate independently of human control.
3. ... was the first step necessary in the development of automation.
4. ... is used in all automatic-control mechanisms when machines have ability to correct themselves.
5. ... have greatly facilitated the use of feedback in manufacturing processes.
6. More recently, the introduction of ... and computers have made possible the development of CAD and CAM technologies.
7. Another development using automation are the flexible ... systems.
8. Small computers are used in systems called ..., which are rapidly becoming a standard part of the modern office.
9. Railways are also controlled by automatic ... devices.
10. The automation technology in manufacturing and assembly is widely used in car and other ... product industries.

The feedback principle

word processors

automation

manufacturing

mechanization

consumer

signaling

computers

microprocessors

operations

III. ***Say whether these sentences are True or False?***

1. Automation is the system of manufacture performing certain tasks.

2. In the 1940s, the automobile industry for the first time used an integrated system of production.

3. The feedback principle is used in not all automatic-control mechanisms.

4. All industries require the same degree of automation.

5. Many industries are highly automated or use automation technology in some part of their operation.

6. Railways are also controlled by automatic signaling devices.

7. The introduction of microprocessors has made possible the development of computer-aided design and computer-aided manufacture (CAD and CAM).

8. A computer in FMS can be used to monitor and control the operation of the whole factory.

9. Using feedback devices machines can start and stop.

10. Computers have greatly facilitated the use of feedback in manufacturing processes.