

## **Тема занятия: «Достижения науки»**

**Цель занятия:** Развитие навыков устной и письменной речи.

Уважаемые студенты! Ознакомьтесь с материалами практического занятия на тему «Достижения науки». Конспект практического занятия выполняйте **в рабочей тетради письменно, обязательно указывая дату занятия, тему занятия, номер упражнения.** Ответы предоставить преподавателю на проверку **до 22. 03. 2024 г.** в электронном виде (**фотоотчёт**) на e-mail [mikagol2605@mail.ru](mailto:mikagol2605@mail.ru). Телефон преподавателя для консультации и возникающих вопросов: +79591415816.

С уважением, Голодюк Марина Викторовна.

- 1. Запишите и выучите новую лексику.**
- 2. Прочитайте и устно переведите текст «Robots in manufacturing».**
- 3. Запишите предложения, вставляя пропущенные слова.**
- 4. Дайте письменно ответы на вопросы к тексту.**
- 5. Переведите на английский язык и запишите предложения.**

- 1. Read the text and translate it.**

### **ROBOTS IN MANUFACTURING**

#### **Vocabulary:**

handling - обращение;

transfer - передача, перенос;

location - местонахождение;

pick up - брать, подбирать;

arrangement - расположение;

to utilize - утилизировать, находить применение;

gripper - захват;

to grasp - схватывать;

spot welding - точечная сварка;

continuous - непрерывный;  
arc welding - электродуговая сварка;  
spray painting – окраска распылением;  
frame - рама;  
spray-painting gun - распылитель краски;  
grinding - шлифование;  
polishing - полирование;  
spindle - шпиндель;  
manual - ручной;  
labour - труд;  
hazardous - опасный;  
shift - смена.

Today most robots are used in manufacturing operations. The applications of robots can be divided into three categories: 1. material handling; 2. processing operations; 3. assembly and inspection. Material-handling is the transfer of material and loading and unloading of machines.

Material-transfer applications require the robot to move materials or work parts from one to another. Many of these tasks are relatively simple: robots pick up parts from one conveyor and place them on another. Other transfer operations are more complex, such as placing parts in an arrangement that can be calculated by the robot. Machine loading and unloading operations utilize a robot to load and unload parts. This requires the robot to be equipped with a gripper that can grasp parts. Usually the gripper must be designed specifically for the particular part geometry. In robotic processing operations, the robot manipulates a tool to perform a process on the work part. Examples of such applications include spot welding, continuous arc welding and spray painting. Spot welding of automobile bodies is one of the most common applications of industrial robots. The robot positions a spot welder against the automobile panels and frames to join them. Arc welding is a continuous process in which robot moves the welding rod along the welding seam. Spray painting is the manipulation of a spray-painting gun over the surface of the object to be coated. Other operations in this category include grinding and

polishing in which a rotating spindle serves as the robot's tool.

The third application area of industrial robots is assembly and inspection. The use of robots in assembly is expected to increase because of the high cost of manual labour. But the design of the product is an important aspect of robotic assembly. Assembly methods that are satisfactory for humans are not always suitable for robots. Screws and nuts are widely used for fastening in manual assembly, but the same operations are extremely difficult for a one-armed robot.

Inspection is another area of factor operations in which the utilization of robots is growing. In a typical inspection job, the robot positions a sensor with respect to the work part and determines whether the part answers the quality specifications. In nearly all industrial robotic applications, the robot provides a substitute for human labour. There are certain characteristics of industrial jobs performed by humans that can be done by robots:

- a) the operation is repetitive, involving the same basic work motions every cycle;
- b) the operation is hazardous or uncomfortable for the human worker (for example: spray painting, spot welding, arc welding, and certain machine loading and unloading tasks);
- c) the workpiece or tool are too heavy and difficult to handle;
- d) the operation allows the robot to be used on two or three shifts.

## **2. Fill in the blanks.**

1. Material-transfer applications require the robot to move ... from one to another.
2. Machine loading and unloading operations utilize ... to load and unload parts.
3. The applications of robots can be divided into three categories: ....
4. In nearly all industrial robotic applications, the robot provides ... for human labour.

### **3. Answer the questions:**

1. How are robots used in manufacturing?
2. What is «material handling»?
3. What does a robot need to be equipped with to do loading and unloading operations?
4. What does robot manipulate in robotic processing operation?
5. What is the most common application of robots in automobile manufacturing?
6. What operations could be done by robot in car manufacturing industry?
7. What are the main reasons to use robots in production?
8. How can robots inspect the quality of production?
9. What operations could be done by robots in hazardous or uncomfortable for the human workers conditions?
10. Call certain characteristics of industrial jobs that can be done by robots.

### **4. Translate into English.**

1. Существует несколько различных сфер использования автоматизации в производстве;
2. Для использования жесткой автоматизации необходимы большие инвестиции;
3. Жесткая автоматизация широко используется в химической промышленности;
4. Станки с числовым программным управлением - хороший пример программируемой автоматизации;
5. Гибкая автоматизация делает возможным перепрограммирование оборудования;
6. Время простоя оборудования оборачивается большими убытками;
7. Использование гибкой автоматизации делает возможным производство разнообразной продукции.