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**Иностранный язык**

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**Тема:** Мaшины и мехaнизмы.

**Тип занятия:** Практическое занятие.

**Основные вопросы:**

1. Выписaть словa с текстa и выучить..

2.Читать и переводить текст.

3.Письменно ответить нa вопросы.

**Robots in manufacturing**

Today most robots are used in manufacturing operations. The applications of robots can be divided into three categories:

1. materialhandling

2. processing operations

3. assembly and inspection.

Material-handling is thetransfer 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: robotspick up parts from one conveyor and place them on another. Other transfer operations are more complex, such as placing parts in anarrangement that can be calculated by the robot. Machine loading and unloading operationsutilize a robot to load and unload parts. This requires the robot to be equipped with agrip-per that cangrasp 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 includespot 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 andframes 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 aspray-painting gun over the surface of the object to be coated. Other operations in this category includegrinding andpolishing in which a rotatingspindle 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 ofmanuallabour. 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 an one-armed robot.

Inspection is another area of factory 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:

1. the operation is repetitive, involving the same basic work motions every cycle,

2. the operation ishazardous or uncomfortable for the human worker (for example: spray painting, spot welding, arc welding, and certain machine loading and unloading tasks),

3. the workpiece or tool is too heavy and difficult to handle,

4. the operation allows the robot to be used on two or three shifts.

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?