

Computer-integrated technologies combine computers, machines, and information systems to improve industrial processes. They allow companies to design, produce, and manage products more effectively. Automation is closely connected with these technologies, as it reduces the need for human labor in repetitive or dangerous tasks. In modern factories, computer-integrated systems control machines, monitor production, and ensure product quality.

A key element of computer-integrated manufacturing is Computer-Aided Design, or CAD. With CAD, engineers can create precise digital models of products before they are built. Another important tool is Computer-Aided Manufacturing, or CAM, which controls machines directly from computer programs. Together, CAD and CAM shorten the time from product design to production.

Automation also includes robots, sensors, and control systems that work together. Robots can perform tasks such as welding, painting, or assembling parts. Sensors collect data about temperature, pressure, and speed, which helps to control machines accurately. Programmable Logic Controllers, or PLCs, are used to manage these processes in real time.

The main advantages of computer-integrated technologies are efficiency, precision, and flexibility. They allow companies to produce more with fewer errors and lower costs. At the same time, they improve workplace safety because machines take over dangerous tasks. However, automation also requires skilled workers who can design, program, and maintain these systems.

In the future, the integration of artificial intelligence and the Internet of Things will make automation even more advanced. Smart factories will be able to adapt production automatically and optimize resources. As a result, computer-integrated technologies will remain a central part of modern industry.

1. What do computer-integrated technologies combine?

- a) Only machines
- b) Computers, machines, and information systems
- c) Only people and computers
- d) Energy and materials

2. What is the role of automation?

- a) To make design more colorful
- b) To reduce the need for human labor
- c) To slow down production
- d) To make products cheaper without technology

3. Which tool helps engineers create digital models?

- a) PLC
- b) CAD
- c) IoT
- d) AI

4. What is CAM mainly used for?

- a) Monitoring workers
- b) Controlling machines from computer programs ☒
- c) Designing buildings
- d) Reducing costs in marketing

5. What kind of tasks can robots perform?

- a) Welding, painting, assembling
- b) Cleaning offices
- c) Reading books
- d) Organizing meetings

6. What do sensors measure?

- a) Emotions
- b) Temperature, pressure, speed
- c) Costs
- d) Time only

7. What does PLC stand for?

- a) Product Line Control
- b) Programmable Logic Controller
- c) Process Line Component
- d) Program Language Code

8. Which of these is an advantage of computer-integrated technologies?

- a) More errors
- b) Lower efficiency
- c) Higher flexibility
- d) Less safety

9. Why are skilled workers still necessary?

- a) To clean machines
- b) To design, program, and maintain systems
- c) To reduce energy bills
- d) To replace robots

10. Which technologies will make automation more advanced in the future?

- a) Artificial intelligence and Internet of Things
- b) Human labor and paper records
- c) Electricity and oil
- d) Manual tools

11. What are smart factories expected to do?

- a) Reduce safety
- b) Adapt production automatically
- c) Increase costs
- d) Use fewer sensors

12. Why is automation important for workplace safety?

- a) It makes workers stronger
- b) It reduces dangerous tasks for humans
- c) It trains robots
- d) It removes safety rules

Fundamentals of IoT (Internet of Things)

The Internet of Things, or IoT, is a modern concept in technology. It means connecting everyday objects to the internet so they can send and receive data. These objects include smartphones, cars, machines, and even household devices like refrigerators. IoT allows devices to communicate with each other without human involvement.

In industry, IoT is used to monitor machines and improve production efficiency. For example, sensors can measure temperature, pressure, or vibration in real time. This information helps companies prevent breakdowns and reduce maintenance costs. In agriculture, IoT systems control irrigation, measure soil moisture, and improve crop yields.

IoT is also important in healthcare. Wearable devices can track heart rate, blood pressure, or steps, sending data to doctors. This gives patients better control of their health and supports early diagnosis. Smart homes are another example, where lights, heating, and security systems are controlled through smartphones.

One of the main advantages of IoT is efficiency. It helps to save energy, reduce costs, and make processes faster. Another benefit is flexibility because devices can adapt to changing conditions automatically. However, IoT also has challenges. Security is a big issue, because connected devices can be attacked by hackers. Privacy is another concern, since personal data is constantly collected.

In the future, IoT will continue to grow and integrate with artificial intelligence. Together, they will create smart cities, where traffic, energy, and services are fully optimized. The Internet of Things is becoming a key part of digital transformation in all areas of life.