

Exercises for distance learning

Task 1. Translate into Russian

Logical circuit elements

As it is known, any digital calculation — whether it is performed by “pencil and paper” methods or with the aid of an automatic computer — must first be broken down into a sequence of elementary arithmetical operations, such as addition or multiplication. Each such arithmetical operation may be converted into a sequence of simple logical operations. It should be noted that a binary digit may take only two values — “zero” and “one.” A logical proposition may be either true or false. A symbolism and a set of rules suitable for manipulating “yes or no” logical propositions were developed by George Boole, a self-educated genius who became Professor of Mathematics at Cork University in the middle of the 19th century. The techniques of Boolean algebra are now extensively used by electrical engineers for the design and analysis of switching circuits. Both the arithmetic and control units of a computer consist of sets of switching circuits for directing and manipulating electrical pulse signals. The process of combining a number of electronic circuits of known logical properties into an integrated system capable of performing special arithmetical or control functions is known as logical design.

Task 2. Match the words.

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| 1. Functional organization of a computer | a) processes and stores large amount of data and solves problems of numerical computations |
| 2. Input | b) circuits used in large-scale digital systems |
| 3. Memory | c) method of interrelation of the main units of a computer |
| 4. Control unit | d) removing data from the device to the outside world |
| 5. Output | e) inserting information into the computer |
| 6. Arithmetic unit | f) a code of combinations of electric pulses |
| 7. Machine language | g) performs addition, subtraction, multiplication, etc. |
| 8. Logic gates | h) stores original data as well as partial results |
| 9. Division | i) causes all parts of the computer to act as a team |
| 10. Digital computer | j) the process opposite to multiplication |
| 11. Transistor | k) electronic and mechanical equipment in a computer system |
| 12. Software | l) a small piece of a semiconductor that greatly reduced power consumption of a circuit |
| 13. Hardware | m) a set of programs, procedures, and associated documentation |

Task 3. Choose the right.

- Computers and their_____ equipment are designed by a computer system architect.
a) engineering; b) accessory; c) specific
- Digital computers use numbers instead of analogous physical_____.
a) symbols; b) equipment; c) quantities
- Systems_____ are usually stored in read-only memory.
a) hardware; b) software; c) firmware
- A computer is a machine with a complex network of electronic _____ that operate switches.
a) circuits; b) cores; c) characters
- In modern electronic computers the _____ is the device that acts as a switch.
a) integrated circuit; b) diode; c) transistor
- A number of actions that convert data into useful information is defined as_____.
a) data; b) processing; c) data processing

7. Computers can store, organize, and retrieve great amounts of information, far beyond the _____ of humans.
a) capacities; b) capabilities; c) accuracy
8. The analyst _____ a computer for solving problems, while the computer system architect _____ computers.
a) requires; b) designs; c) uses
9. The use of _____ computers will continue to increase with the growth in applications of microprocessors and minicomputers.
a) analog; b) digital; c) hybrid
10. The development of third-generation computers became possible due to the invention of _____.
a) integrated circuits; b) electronic tubes; c) transistors