Ministry of Public Health of Ukraine
"Ukrainian Medical Stomatological Academy"

"APPROVED"
at the meeting of the Department
of Medical Informatics, Medical Biophysics
«27» august 2020
Minutes №. 1 «27» august 2020
Head of department _____ O.V.Silkova

METHODICAL GUIDANCE

for students' self-directed work when preparing and during the practical session

Academic Subject	Medical Information Science
Module No 2	Medical knowledge and decision making in medicine and dentistry
Topic	Advocacy of calculation-graphic work
Year of study	2
Speciality	Foreign Student Training (Medcine)
Number of academic hours	2

Poltava – 2020

1. Relevance of the topic:

Human-machine interaction is linked with some possible risks. In the case of computer there are electrical influences mainly. In professional work of the doctor are necessary knowledge on usage of computer technologies and their application in medicine for saving working hours by operation with the information, its systematization, processing. Modern doctor's professional activity is impossible without computers, computer-based methods, networks and information system using. Study of informatics bases is necessary to the future profession of students, forms professional skills and experience.

2. The specific aims:

- With basic concepts of topic;
- How to use computer correct;
- Definitions of main terms, laws, concepts, rules;
- Features of main hardware components;
- Features of main software types;
- How to use main software using formedical tasks solution.
- To use basic laws for analysis of tasks;
- To explain concept of medical computer science, a problem of information of medicine, object a subject of learning of medical computer science, the purpose of medical computer science, the main stages of implementation of a computer in domestic public health services

3. Basic knowledge and skills necessary to study the topic (inter-disciplinary integration).

Previous (providing disciplines)	*Obtainable skills*
The previous (providing) disciplines: Mathematics, physics	To know definitions of basic concepts. To skill basic knowledge on medical informatics. To define concept of the information, computer science as sciences
The subsequent disciplines: Social hygiene	To know software features and basic rules. Го define concept of the information, and informatics as sciences; to discriminate information types; to explain properties of the information.
Inter-subject integration: Clinical disciplines	To know links of knowledge obtained at practice. To use obtained knowledge in practice.

4. The tasks for students' individual work

4.1. The list of basic term, parameters, characteristics, which student should master while preparin for the class.

Term	Definition

4.2 Theoretical questions for the class (to the topic):

1. Logic as science. Algebra of logic. Its concepts.
2. Logical operations, truth table for each operation.
3. Definition of the algorithm. Notation of algorithms.
4. Properties of algorithm. Types of algorithms. The main blocks of the block diagram.
5. Definition of model. The types of models which used in medicine and biology.
6. Definition of model. Stages of mathematical modeling.
7. Definition of model. Examples of models.
8. Expert System (ES), the overall structure of the ES.
9. Expert System (ES). Classification of the ES.
10. Medical Information System (MIS). The purpose of the MIS.
11. Medical Information System (MIS). Tasks that it solves in hospitals.
12. Medical Information System (MIS). Classification of MIS.
13. Evidence-based medicine. Aspects of evidence-based medicine.
14. Evidence-based medicine. The principle of "PICO" in evidence-based medicine, structure issues.
15. Evidence-based medicine. Resources based medicine. Cochrane collaboration.

4.3 Practical tasks pertaining to the topic and to be completed during the class:

Test

1. What is an algorithm?

a) a set of rules;
b) a list of instructions, which leads to getting results;
c) list of actions;
d) table of formulas;
e) set of narrative sentences.

2. $\frac{1+5y}{3zy}$ Which variant correctly reflects the arithmetic expression on algorithmic language?

a) 1 + 5y / 3zy;
b) 1 + 5 * y / 3 * z * y;
c) 1 + 5 * y / (3 * z * y);
d) 1 + 5y / 3z * y;
e) (1 + 5 * y) / (3 * z * y).

3. Let A = 0, B = 0. The result of logical operation (A ↔ B) will be:

a) 1;
b) 10;
c) 11;
d) 2;
e) 0.

4. What is the value of the expression **A** ∨ **1**?

a) 0; 1
b) 1;
c) 2;
d) 0;
e) 1; 0

5. Musical notes, a collection of poems, school evacuation plan, plan of the metro - examples of the...

a) informational model;
b) verbal model;
c) material model;
d) physical model;
e) biological model.

6. Using the model, you can:

a) to predict future behavior of a real object;
b) to obtain new information about already studied object;
c) to construct a table of values space-time interval;
d) to create a graph of values of the space-time interval;
e) to take all available factors of influence.

7. The smallest piece of data in a database is a:

a) data bit;
b) field;
c) record;
d) byte;
e) cell.

8. Give the determination of "expert system"

a) The discipline of acquiring, encoding and using human domain knowledge to develop a computer application;
b) A computer program that uses domain knowledge to perform specific task usually human experts performs;
c) A store of both factual and heuristic knowledge;
d) Technologies of excavation of the data;
e) User Base.

9. How does name the algorithm, which consists of commands that can be executed more than once?

a) linear;
b) condition;
c) branching;
d) cycle;
e) array.

10. The command can be made by...
a) gesture;
b) question;
c) selection button in the window;
d) all of above;
e) none of above.

5. Content of the topic:

QUESTION CARD № 16

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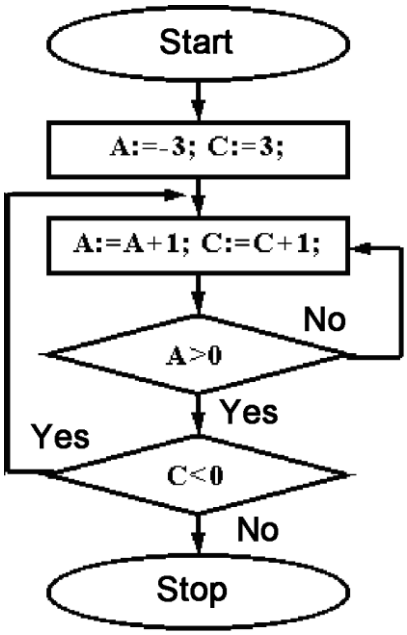
<td> 
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<td>1. Determine target values of variables A and C after execution of algorithm:</td>
</tr>
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2. Construct a truth table for the logical formula:
$F(A,B)=(A \rightarrow B) \vee (\neg B \wedge A) \rightarrow B$

6. References:

- Lecture.
- L.D.Korovina. Medical information science. Vol.1. Basics of information technology.- Poltava, 2008. -146 p.

Additional textbooks, journals and references:

- Biophysics and medical informatics. - Marzeniuk V.P. et all.- Ternopil, Ukrmedkniha, 2004.-480 p.
- Abramowitz, Milton, and Irene A. Stegun, eds. *Handbook of Mathematical Functions, with Formulas, Graphs, and Mathematical Tables.* Washington, D.C.: U.S. Government Printing Office, 1972.
- Sokal, Robert R., and F. James Rohlf. *Biometry: The Principles and Practice of Statistics in Biological Research.* 2nd ed. New York: W. H. Freeman, 1995.

The methodical guidance has been completed by **S.Y. Olenets**