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Информация о владельце:
ФИО: Порохня Андрей Алексеевич
Должность: И.о. директора института перспективной инженерии
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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
Higher Education
"NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVED BY
Acting Director of the Institute
Advanced Engineering
Cand. Tech. Sci., Associate Professor
A.A. Porokhnya

FUND OF ASSESSMENT TOOLS
Advanced Language Programming C

Field of study	11.03.02 Infocommunication Technologies and Communication Systems
Profile	Intelligent Data Processing in Infocommunication Systems and Networks
Year of start of training	2026
Form of study	Full-time
Implemented in a semester	2

Introduction

1. Purpose

The Foundation of Assessment Tools for the discipline "Advanced Programming Language C" is designed for an objective assessment of the level of competence formation.

2. FOS is an appendix to the program of the discipline "Advanced C Programming Language".

3. Developer S.V. Govorova, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

4. An examination of the FOC was carried out.

Members of the expert group:

Chairman: V.P. Mochalov, Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Members of the Commission:

S.V. Yakovlev, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

S.V. Melnikov, Senior Researcher of the Interdisciplinary Training and Research Center for Agricultural Technologies, Associate Professor of the Department of Digital, Robotic Systems and Electronics of the Institute of Advanced Engineering.

Representative of the employer's organization:

Mironov V.A., General Director of Orintex LLC.

Expert opinion: The FAT for the discipline allows you to assess the level of competence formation. Start approbation.

5. The validity period of the FAT is determined by the period of implementation of the educational program.

Description of indicators and assessment criteria at various stages of their formation, description of assessment scales

Levels of competence formation(s), indicator(s)	Descriptors			
	The minimum level has not been reached (Unsatisfactory) 2 points	Minimum level (satisfactory) 3 points	Intermediate level (good) 4 points	High level (excellent) 5 points
Competency: OPK-3				
Learning outcomes in the discipline (module): <i>Indicator:</i> ID-3 OPK-3 is able to solve data processing problems using computer technology.	It does not solve the problem of data processing using computer technology, using the C++ language.	It poorly solves the problem of data processing using computer technology, using the C++ language.	It solves the problem of data processing with the help of computer technology using the C++ language quite completely.	He clearly solves the problem of data processing using computer technology, using the C++ language.
OPK-4				
ID-4 OPK-4 is able to use the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes.	Does not use the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes, does not use the C++ language to solve information processing problems	Poorly uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes	Basically, he correctly uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes	It fully uses the capabilities of computer technology and software to solve problems of control and algorithmization of information processing processes
OPK-5				
ID-2 OPK-5 is able to read the codes of software products written in mastered programming languages and make the required changes.	Cannot read the code of software products written in mastered programming languages, and does not make the required changes	He reads the codes of software products written in mastered programming languages, and does not make the required changes, making significant mistakes	Reads the codes of software products written in mastered programming languages and does not make the required changes, making minor mistakes	Competently reads the codes of software products written in mastered programming languages, and does not make the required changes

ID-3 _{OPK-5} has the skills to develop original algorithms and computer programs suitable for practical use.	Has difficulty developing original algorithms and computer programs suitable for practical use	Makes serious mistakes in the development of original algorithms and computer programs suitable for practical use	Mainly accurately develops original algorithms and computer programs suitable for practical application. Can make minor mistakes.	Competently develops original algorithms and computer programs suitable for practical use
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ASSESSMENT TOOLS TO CHECK THE LEVEL OF FORMATION OF COMPETENCIES

Job Number	Correct answer	Content of the question	Competence
1.	2,3	Which statements about safe functions and classes are true? 1. A class method is safe when the list of exceptions it throws matches the list of exceptions in the method specification 2. A class is safe when all of its methods are safe 3. A function is safe when all the exceptions thrown inside its function are handled inside the function 4. To write safe classes, you must prevent the use of exceptions	OPK-3
2.	3	Which function is called recursive 1. The result is passed through the function name. 2. The result is passed through a formal parameter-pointer. 3. In the body of the function there is an operator for calling the same function. 4. There is a return operator in the body of the function.	OPK-3
3.	3	What is considered a C language identifier? 1. Lab 1 2. Product 3. _time 4. a+b 5. C++	OPK-3
4.	4	Exponentiation is implemented with the help of the 1. fn() 2. degree() 3. power() 4. pow()	OPK-3
5.	3	How will the program run if you don't use the break statement in the switch switch? 1. If a key expression matches the label, the corresponding statement is executed and control is passed to the end of the switch. 2. The compiler will detect a syntax error. 3. If a key expression matches the label, the corresponding statement is executed and control is passed on to the next case branch	OPK-3

		4. If a key expression matches the label, the corresponding statement is executed and control is transferred to the default branch	
6.	3	The array is initialized as follows: int x[5]={1,2,3,4,5}; What will be the error on the next recording of the x[4]=x[5]+1 operator; 1. Syntax error 2. The operator is written correctly 3. Array boundary violation 4. Invalid initialization	OPK-3
7.	4	Which operator must be present in a recursive function? 1. Handover Operator 2. Loop Operator 3. Return statement ; 4. Recursion End Check Operator	OPK-3
8.	4	What type of structure elements (fields) can there be? 1. Outline fields must be of the same type. 2. Structure fields cannot be arrays. 3. Outline fields can be files. 4. Struct fields can be other structs.	OPK-3
9.	2,3,5	Check all the correct statements about arrays in C++ 1. Array elements can be of different types 2. All elements of the array must be of the same type 3. Elements in memory are located next to each other 4. Elements can be located one at a time in memory 5. Items are always numbered from scratch	OPK-3
10.	1	How can I access the Year field of the Student object of the Person structure type? 1. Student.Year. 2. scanf("%d",& Person.Year). 3. Person.Year.	OPK-3
11.		What are the differences between an array and a file?	OPK-3
12.		To find the module of a real number, which command is used	OPK-3

13.		If the value of the switching expression does not match any of the constant expressions, then the switch is made to the operator marked with the	OPK-3
14.		The binary file contains an array of 10 integers int ar[10]. How to replace the 3rd element of the array	OPK-3
15.		Suppose a two-dimensional dynamic array is created <code>a[3][3]</code> . How can you access the <code>a[2][3]</code>	OPK-3
16.		To store real numbers with double precision, the type	OPK-3
17.		The operation of calculating the size (in bytes) is implemented using the expression	OPK-3
18.		Disjunction in C++ is denoted by the symbol	OPK-3
19.		The logical expression "not equal" is denoted by symbols	OPK-3
20.		How to Free Up Dynamic Memory Occupied by All Array Elements	OPK-3
21.		What will the variable "c" be after this program is executed: <pre> a = 26; b = 6; c = a % b + b; </pre>	OPK-3
22.		What will the variable "c" be after this program is executed: <pre> a = 24; b = 5; b = a / b; c = a % (b + 1); </pre>	OPK-3
23.		Determine the value of the variable "a" after executing the program fragment: <pre> a = 10; if (a < 5) a = a + 12; else a = a - 7; </pre>	OPK-3
24.		Determine the value of the variable "a" after executing the program fragment:	OPK-3

		<pre> a = 10; if (a > 5) a = a + 12; else a = a - 7; if (a > 5) a = a + 12; else a = a - 7; </pre>	
25.		Determine the value of the variable "a" after executing the program fragment: <pre> a = 10; b = 7; if (a > 5 && a < b) a = a - 5; </pre>	OPK-3
26.	3	Which cycle will always run at least once? 1. Loop with the 2. Loop with an unspecified number of repetitions while {...} 3. Loop with an unspecified number of repetitions do {...} while	OPK-4
27.	1,3	Methods and attributes of a base class with which access modifier are available to descendant classes? 1. public 2. private 3. protected 4. default (without specifying an access modifier)	OPK-4
28.	1,3	The cin input operator can specify the input of multiple variables in a single command using the following syntax: 1. cin » <variable1> » <variable2>...; 2. cin » <variable1>,<variable2>,...; 3. cin » <variable1> » <variable2> » endl »...; 4. All answers are correct	OPK-4
29.	2	To store real numbers with great precision, the type 1. double	OPK-4

		2. long double 3. float 4. long int	
30.	1	The individual symbols are contained in 1. apostrophes 2. Quotation marks 3. Dollar Signs 4. Percentage Signs	OPK-4
31.	2	Arrays of symbols consist of 1. apostrophes 2. in quotation marks 3. Dollar Signs 4. Dollar Signs	OPK-4
32.	3	An empty type is denoted by using the 1. zero 2. null 3. void 4. absent	OPK-4
33.	3,4	An example of a logical expression would be 1. enum {zero, one, two, three}; 2. void 3. true 4. false	OPK-4
34.	3	The pointer data type is denoted by using the 1. pointer 2. ptr 3. * 4. null	OPK-4
35.	4	In order for the elements of the array to become immutable, put the word 1. stack 2. register	OPK-4

		3. int 4. const	
36.		Operators in C++ mean	OPK-4
37.		Suppose a singly linked list of structures is created. Pointer to Start <code>struct spis *head</code> . How do I remove the 1st item from the list?	OPK-4
38.		Variables initialized to the main function are	OPK-4
39.		How do you remove the penultimate structure from a doubly linked list if you know the pointer to the beginning of the head and the end of the tail?	OPK-4
40.		The elements of an array are related in that they have the same...	OPK-4
41.		The operator is used to make decisions	OPK-4
42.		How do I specify a one-line comment?	OPK-4
43.		Preprocessor directives are...	OPK-4
44.		Global variables are available in ...	OPK-4
45.		What logical operation should be added to the program instead of an ellipsis so that the value of the variable "a" becomes 15 after the program fragment is executed? <pre> a = 10; b = 5; if (a < 1 ... a > b) a = a - 5; else a = a + 5; </pre>	OPK-4
46.		What number will be displayed as a result of the execution of the program fragment?	OPK-4

		<pre> i = 6; cout << "9"; while (i < 5) { cout << i; i++; } </pre>	
47.		What number do you need to write instead of an ellipsis for the cycle to run exactly 2 times? <pre> i = 4; while (i >= ...) { cout << "Привет!\n"; i--; } </pre>	OPK-4
48.		What will the value of the integer variable "a" be after this program fragment is executed? <pre> a = 2; for (i=0; i<=4; i++) a += i; </pre>	OPK-4
49.		What will be displayed on the screen after running this fragment of the program? <pre> for (i=2; i>=1; i--) cout << i; </pre>	OPK-4
50.		What index has the last element of array A? <pre> int A[6]; </pre>	OPK-4
51.	2,3,5	Check all the correct statements about arrays in C++ 1. Array elements can be of different types 2. All elements of the array must be of the same type 3. Elements in memory are located next to each other	OPK-5

		4. Elements can be located one at a time in memory 5. Items are always numbered from scratch	
52.	3	Specify incorrect allocation of heap if <code>int *pt</code> is declared; 1. <code>pt = new int;</code> 2. <code>pt = new int [15];</code> 3. <code>pt = new int [];</code> 4. <code>pt = new int (15);</code>	OPK-5
53.	2	How local and global objects change in recursive functions 1. Global objects do not retain their values after recursion is complete 2. Repeated calls to the recursive function create a new set of local objects 3. Local objects retain their values after the recursion is complete	OPK-5
54.	2,4,5	What operations do you perform in the designer? 1. allocating memory for an object of the class to be created 2. initializing class members specified in the initialization list 3. initializing members of a base class that are not specified in the initialization list 4. Initialize User-Defined Class Members Not Specified in the Initialization List 5. Executing the Constructor Body	OPK-5
55.	2	Compiler Instructions 1. it is a macro assembler 2. these are special instructions that the C++ compiler follows at compile time 3. It's a microassembler 4. This is the task management language	OPK-5
56.	2	Declaring a Variable 1. defines its scope 2. specifies its name and attributes 3. convergence of the series 4. determines its life cycle	OPK-5
57.	3	Feature declaration 1. defines its scope	OPK-5

		2. determines its life cycle 3. specifies its name, return type, and attributes of its formal parameters 4. frees up RAM for it	
58.	2,3	A type declaration allows the programmer to 1. Define the specification of the input parameters 2. Specify the type of return value 3. assign your name to some basic or composite type of the C++ language 4. Define the specification of the output parameters	OPK-5
59.	3	Header files are attached via a preprocessor directive 1. <code>#define</code> 2. <code>oldtimer</code> 3. <code>#include</code> 4. <code>\$sizeof</code>	OPK-5
60.	4	One-line comments are implemented using the 1. <code>#</code> 2. <code>/* ... */</code> 3. <code>\$</code> 4. <code>//</code>	OPK-5
61.	2	Multi-line comments are implemented using the 1. <code>#</code> 2. <code>/* ... */</code> 3. <code>\$</code> 4. <code>//</code>	OPK-5
62.	1,2,3	Identifiers consist of 1. letters of the Latin alphabet 2. digits 3. underscores 4. hashtags	OPK-5
63.	2	Constants are lexemes that are 1. variable numeric or symbolic values	OPK-5

		2. fixed numeric or symbolic values 3. Date/Time Values 4. Boolean values	
64.	3	Constants of the enumerated type are denoted by the expression 1. global 2. int 3. enum 4. target	OPK-5
65.	1	To store small integers, you use the 1. short 2. tiny 3. int 4. long	OPK-5
66.	3	To store integers with normal precision, the type 1. short 2. tiny 3. int 4. long	OPK-5
67.	4	To store large integers, use the type 1. short 2. tiny 3. int 4. long	OPK-5
68.	3	Real constants are numbers based on: 1. e 2. π 3. 10 4. 2	OPK-5
69.	2	As a separator in real constants, the following is used 1. comma	OPK-5

		2. Point 3. colon 4. semicolon	
70.	3	To store real numbers with normal precision, the type 1. double 2. long double 3. float 4. long int	OPK-5
71.		How do I open a binary file to change the information in it?	OPK-5
72.		What type of data can't use structs as a component	OPK-5
73.		What is the difference between a global variable and a local one?	OPK-5
74.		Suppose a matrix is declared and initialized <pre>float a[3][3]={1,-0.5,3,2,1.5,3,-2,3,1};</pre> You want to output the matrix by rows	OPK-5
75.		Which cycle will always run at least once?	OPK-5
76.		How the program will run if you don't use the break statement in the switch switch	OPK-5
77.		Write the expression in C and C++ $x = 5 \ln(y^3 - \sqrt{ z }) / e^z$, where <code>float x, y, z;</code>	OPK-5
78.		How is the logical operation "AND" designated in C and C++?	OPK-5
79.		You need to fill the array like this: <pre>X = [1 3 5 7 9 11]</pre> Which operator should be placed in the body of the loop instead of an ellipsis? <pre>for (k=0; k<6; k++) { ... }</pre>	OPK-5
80.		The array A[N] is specified. Which operator should be used instead of an ellipsis to find the sum of all the elements of the array in the variable S? Enter the answer without spaces.	OPK-5

		<pre> S = 0; for (k=0 k<N; k++) { ... } </pre>	
81.		Specify the order in which heap is allocated to a two-dimensional array <pre> 1. matr[i] = new int [m]; 2. int n=5, m=6, **matr; 3. for (int i=0; i<n; i++) 4. matr = new int * [n]; </pre>	OPK-5
82.		What does this code snippet do? <pre> int *mas, n=10, i; mas = new int [n]; mas[0]= a[1]=1; for (i=2; i<n; i++) mas[i]= mas[i-1]+ mas[i-2]; </pre>	OPK-5
83.		To display text on the screen in C++, you use the	OPK-5
84.		Methods and attributes of a base class with which access modifier are available to descendant classes?	OPK-5
85.		What will be displayed as a result of the execution of the program fragment. Here, a and b are integer variables. <pre> a=5; b=3; cout << a << "Z(" << b << ")"; </pre>	OPK-5
86.		As a result of the code's work, what will be output <pre> int *m=new int,*i; *m=10; i=new int;*i=14; printf("*m=%d *i=%d",*m,*i); </pre>	OPK-5
87.		What will the code below show?	OPK-5

		<pre>int const a = 5; a++; cout << a;</pre>	
88.		Which attributes of the User class are declared correctly? <pre>class User { public: const char* name; inline int age; private: volatile double balance; mutable char* job_name; protected: long long phone_number; static int phone_prefix = 499; };</pre>	OPK-5
89.		What is inheritance	OPK-5
90.		To enter text from the keyboard in C++, you use the	OPK-5

2. Description of the rating scale

Within the framework of the rating system, the performance of students in each discipline is assessed during current control and intermediate certification. The rating system for assessing students' knowledge is based on the use of a set of control measures to check the material covered (control points), optimally located throughout the time interval of studying the discipline. The principles of the rating system for assessing students' knowledge are based on the requirements described in the Regulation on the organization of the educational process based on the rating system for assessing students' knowledge at NCFU.

3. Criteria for assessing competencies

The grade "excellent" is given if the student has demonstrated a high ability to apply the acquired knowledge in practice using computer technology and software to solve problems of control and algorithmization of information processing processes, freely coped with the task, showing the possession of versatile techniques and skills for its implementation, did not make mistakes and inaccuracies;

A grade of "good" is given if the student has demonstrated the ability to apply the acquired knowledge in practice using computer technology and software to solve problems of control and algorithmization of information processing processes, coped with the task, showing the possession of the necessary techniques and skills for its implementation, while making no more than one mistake;

The grade "satisfactory" is given if the student has demonstrated a mediocre ability to apply the acquired knowledge in practice using computer technology and software to solve problems of control and algorithmization of information processing processes, has difficulty coping with the task, while making no more than two mistakes;

The grade "unsatisfactory" is given if the student has not demonstrated the ability to apply the acquired knowledge in practice using computer technology and software to solve problems of control and algorithmization of information processing processes, did not cope with the task or made three or more serious mistakes in solving it.