Virtual name
of answering:_____

National Technical University «Kharkiv Polytechnic Institute»
(NTU «KPI»)
Faculty « Computer technologies and programming » (CTP)

COMPETITION QUESTIONS

the second phase of All Ukrainian student's Olympiad
«System's programming»
April 7-10, 2009 for I tour (theoretical)

Mark the number of a right answer in each question:

№	The texts of a questions	Balls
1	To define, what operation will be executed in the fragment of the program in assembly of kh86 family of commands of SSE2 language: mas1 dd 11.4, 14.02, 9.8, 4.0, 12.14, 1.82, 67.54, 9.95, 7.16 mas2 dd 11.4, 14.02, 3.14, 2.718, 5.0, 45.45, 23.35, 9.95, 79.2 ... cmppd XMM0, XMM1, 0 1.1) less than; 1.2) anymore; 1.3) less than or equal; 1.4) not comparisons; 1.5) equalities.	20
2	Access of user to the resources, for example to the files, plans: 2.1) Plans nothing; 2.2) Program which utillizes this resource; 2.3) File System; 2.4) Operating System; 2.5) Disk driver.	20
3	For the correct decision of task «producers-consumers» with a circular buffer on 5 aggregates of data on semaphores necessary amount of objects of kernel - semaphores are: 3.1) 0; 3.2) 1; 3.3) 2; 3.4) 3; 3.5) 5.	20
4	What subsystem of the file system does execute the translation of the character file name in the internal identifier of file? 4.1) Base file system; 4.2) Logical organization of files 4.3) Control the system by an input/conclusion; 4.4) Physical organization of files; 4.5) Logical file system.	20
5	That does execute next function? void func(char *s) {char *x, *y; for(x=s; *x==' '; x++); if (*x) for(y=s; *y; *y++=*x++);} 5.1) Deletes character of blank at the end of line; 5.2) Deletes character of blank at the beginning of line; 5.3) Deletes all of characters of blank at the beginning of line; 5.4) Deletes all of characters of blank at the end of line; 5.5) Determines position of the first blank in a line; 5.6) Determines position of the last blank in a line.	20
6	That does execute next function? int func(char *s) { char *x, h; int k; for (h=' ',k=0,x=s; *x; h=*x++) if ((h==' ')&&(*x!=' ')) k++; return(k); } 6.1) Counts up the amount of characters which are not blanks, in a line; 6.2) Counts up the amount of words in a line, part blanks; 6.3) Counts up the amount of characters of blank in a line; 6.4) Counts up the amount of characters to the first blank in a line; 6.5) Counts up the amount of blanks in a line to the first character which is not a blank.	20
7	Specify the terms which adequate to classification of memory on the basis of allocation: 7.1) Static memory. Dynamic memory. Stack. 7.2) Undefined memory. Escaping memory. Buffers. Queues. Stratification memory; 7.3) Sequential access memory. Asynchronous access memory. Separative access memory; 7.4) Read-only memory. Extending memory. Balancing memory; 7.5) Predefined memory. Indirect memory. Floating memory.	20
8	Transition to the m1 label while execution of x86 assembler program: TEST_REC RECORD FLAG1:1=1,FLAG2:1=0,FLAG3:1,TVAL:12=0fffh .data TRec TEST_REC <,1,,2> .code main: ... mov AX, [TRec] and AX, MASK FLAG2 Je m1 ... m1: ... passing to the mark m1: 8.1) Will be carried out; 8.2) Will depend on memory cell value; 8.3) Will not be fulfilled; 8.4) Will depend on TRec address value; 8.5) Cannot be carried out because of syntax errors in the resulted code.	20
9	AX register while execution of x86 assembler program. TEST_REC RECORD FLAG1:1=1,FLAG2:1=0,FLAG3:1,TVAL:12=0fffh .data TRec TEST_REC <,1,,2> .code main: ... mov ax, MASK TEST_REC will contain: 9.1) 6002h; 9.2) 7fffh; 9.3) 4fffh; 9.4) ffffh; 9.5) 0000h.	20
10	What will as a result of the C++ code program (standard output stream is linked to standard console): class One {private: int x; public: ~One() {} void operator delete(void* address, size_t bytes) { cout << "One "; } }; class Two : public One {private: int y; public: ~Two() {} void operator delete(void* address, size_t bytes) { cout << "Two "; } }; void main (void) { Two* b = new Two; delete b; One* f = new Two; delete f; } 10.1) Two Two; 10.2) Two One; 10.3) Two One Two; 10.4) Two; 10.5) One.	20
11	To hide the application window in the task bar Windows XP at creation of the window it is enough to use: 11.1) WS_EX_OVERLAPPEDWINDOW; 11.2) WS_EX_PALETTEWINDOW; 11.3) WS_EX_TOOLWINDOW; 11.4) The combination of first two styles; 11.5) It is not enough to use extended styles.	20

12	As a result of the C-code execution: char v[10]="\0", c=0; (++c+v)[c&1]=*v==0; 12.1) Contents of v[0] cell will vary; 12.2) v[1] becomes equal 1; 12.3) v[2] will be inverted; 12.4) Contents of the v array will not vary; 12.5) The result will be the same as an execution of the following code: char v[10]="\0", c=1; (++c+v)[c&1]=*v==0;	20
13	For C++ class One and function f(): class One {friend One * f(One *); One() {} ~One() {} void * operator new (size_t sz) { return ::operator new(sz);} }; One * f(One * o) {if(o) return delete o, NULL; else return (o=new One);} the main() function executed without errors looks like this: 13.1) void main() { One *o = NULL; o=f(o); o=f(o); } 13.2) void main() { One *o = NULL; o=f(o); delete o; } 13.3) void main() { One o; f(&o); } 13.4) void main() { One *o = f(o=NULL); delete o; } 13.5) void main() { One *o = new(One); o=f(o); o=f(o); }	20
14	The C++ program: class One {friend void f() { One o; } One() {} ~One() {} }; void main() { One *o = new(One); f(); } 14.1) Will be compiled and fulfilled without errors; 14.2) The compiler will inform on error of call the function f(); 14.3) At compilation it will become a reason of error linked with object One creation in the body of function f(); 14.4) At compilation it will call an error of access to constructor One::One; 14.5) Will be compiled but become a reason of the runtime error at creation of dynamic object One.	20
15	The C++ program: class One { public: ~One() {} }; class Two: public One {int *v; public: Two(int n): v(new int[n]) {} ~Two() {delete [] v;} }; void main() {One *o = new Two(1024); delete o;} 15.1) Will be compiled and fulfilled without errors; 15.2) At compilation it will become a reason of error linked with dynamic object creation of class Two; 15.3) At compilation it will call an error of access to constructor One::One; 15.4) At compilation it will call an error of access to constructor Two::Two; 15.5) Will be compiled and fulfilled but the memory under "v" pointer will not be released during object "o" deleting.	20
16	What line is improper (C# language): 16.1) int[,][] array = new int[10,15][]; 16.2) int[][] array = new int[10][]; 16.3) int[][,] array = new int[10][,]; 16.4) int[][][] array = new int[10][][]; 16.5) int[][][] array = new int[10][15][].	20
17	The how many subnet can be built at the use of IP address of network of 192.17.71.0/27? 17.1) 1; 17.1) 2; 17.3) 4; 17.4) 8; 17.5) 16.	20
18	What mask corresponds the IP address of 185.23.44.206/18? 18.1) 255.255.16.0; 18.2) 255.255.255.192; 18.3) 255.255.192.0; 18.4) FF.FF.F0.00; 18.5) FF.FF.FF.00.	20

19	That will be shown out as a result of execute of the program (Visual Studio C++ 6.0 and higher)?
	int buf[6]; HANDLE hThr1, hThr2;
	DWORD ThreadProc1(LPVOID lpPar){for(int i=0;i<6;i++)buf[i]=i;return 0;}
	DWORD ThreadProc2(LPVOID lpPar){WaitForSingleObject(hThr1, INFINITE); for(int i=0;i<6;i+=2) buf[i]=i*2;return 0;}
	void _tmain(int argc, _TCHAR* argv[]){
	hThr1 = CreateThread(NULL,NULL, (LPTHREAD_START_ROUTINE)ThreadProc1, NULL, NULL,NULL);
	hThr2 = CreateThread(NULL,NULL, (LPTHREAD_START_ROUTINE)ThreadProc2, NULL, NULL,NULL);
	WaitForSingleObject(hThr2, INFINITE); for(int i=0;i<6;i++)cout<<buf[i]<<" ";}
	19.1) 0 1 2 3 4 5; 19.2) 0 0 4 0 8 0; 19.3) 0 1 4 3 8 5; 19.4) answer is not present; 19.5) error in program.
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20	Let on a disk from 100 cylinders (from 0 to 99) there is the following turn of queries: 23, 67, 55, 14, 31, 7, 84, 10 and heads in initial moment are on a 63 cylinder. How will realization of algorithm Short Seek Time First (SSTF) planner of queries to the disk? 20.1) 63→23→67→55→14→31→7→84→10; 20.2) 63→55→31→23→14→10→7→0→67→84; 20.3) 63→67→55→31→23→14→10→7→84; 20.4) 63→55→31→23→14→10→7→0→99→84→67; 20.5) 63→55→31→23→14→10→7→84→67.	20
21	That will be shown out as a result of implementation of the program (Visual Studio C++ 6.0 and higher)? int buf[2]; PVOID Fiber1,Fiber2; VOID WINAPI Func1(PVOID Param){for(int i=0;i<2;i++){buf[i]=i+1;cout<<buf[i]<<" ";}} VOID WINAPI Func2(PVOID Param){ SwitchToFiber(Fiber1);for(int i=0;i<2;i+=2){buf[i]=(i+1)*2;cout<<buf[i]<<" ";}} void _tmain(int argc, _TCHAR* argv[]){ Fiber1 = CreateFiber(0, Func1,0); Fiber2 = CreateFiber(0, Func2,0); ConvertThreadToFiber(0);SwitchToFiber(Fiber2);for(int i=0;i<2;i++){buf[i] += i; cout<<buf[i]<<" ";}} 21.1) 1 2 1 3; 21.2) 1 2; 21.3) 1 2 2 4 2 5; 21.4) 1 2 2 4; 21.5) program error.	20
22	In a project in language of N# under NET Framework (v.2.0 and higher) a class is declared: class MyDataClass{public int myInt; public string myString; public bool myBool; public object myObject;} What from the assertions resulted below incorrectly for the just created copy of this class? 22.1) The value of myInt is equal 0; 22.2) The value of myString is equal null; 22.3) The value of myBool is equal false; 22.4) The value of myObject is equal null; 22.5) The values of the fields of copy of MyDataClass are uncertain.	20
23	There is the program, using a palette from a few tenss of values of color simultaneously. What from the types of graphic adapter will be able correctly to execute such program on any computer? 23.1) Hercules; 23.2) CGA; 23.3) EGA; 23.4) VGA; 23.5) Any of indicated (on the left).	20
24	That will be shown out on a screen as a result of implementation of C++ program fragment with compiling under Microsoft Visual Studio v.6 (MSVS6) and under Microsoft Visual Studio 2003/2005/2008 (MSVS2003-2008): int a=10; cout<<a<<" "; cout<<a<<" "<<(a=20)<<" "<<a<<" "<<(a=30)<<" "<<a<<" "; cout<<a<<"\n"; 24.1) MSVS6: 10 10 20 20 30 30 30 MSVS2003-2008: 10 10 20 20 30 30 30 24.2) MSVS6: 10 20 20 20 20 20 20 MSVS2003-2008: 10 20 20 20 20 20 20 24.3) MSVS6: 10 20 20 30 30 10 20 MSVS2003-2008: 10 20 20 20 20 20 20 24.4) MSVS6: 10 20 20 20 20 20 20 MSVS2003-2008: 10 20 20 30 30 10 20 24.5) nothing, syntactical errors.	20
25	In the program there are lines of conclusion in the working window of the program of two straight lines in thick a 1 pixel to point x=100, y=10: MoveToEx(hDC,(x= 10),(y=10),0); LineTo(hDC,(x=100),(y=10)); MoveToEx(hDC,(x=200),(y=10),0); LineTo(hDC,(x=100),(y=10)); Specify the number of right answer for the executed conclusion. 25.1) A few general pixels have lines; 25.2) Lines have one general pixel; 25.3) Lines adjoin, but general pixels are not present; 25.4) Between lines there is one not painted out pixel; 25.5) Between lines space is from a few, not painted out pixels.	20
	The maximal total balls for I tour:	**500**