

Example questions and sample answers for second-cycle qualification test: Computer Science and Intelligent Systems

1 Algorithms and data structures

1. Which statements from the list below are true

a) Pessimistic computational complexity for the heap sort algorithm is equal to $O(n \cdot \log n)$.

2. In a binary tree the inorder search is realized in following way

a) Examine in the order: current node, left subtree, right subtree.

3. A task of size n , realized by an algorithm having computational complexity of $f(n)$, was divided into two sub-tasks of size $\frac{n}{2}$ each and n actions of constant execution time, responsible for dividing and merging of the task. The $f(n)$ complexity is equal to:

a) $f(n) = O(n)$,

4. A directed graph $G=(V,E)$ is given, where $V=\{ 1,2,3,4,5,6 \}$, $E=\{ (1,2), (1,3), (2,4), (2,5), (4,5), (5,1), (3,5), (3,6) \}$. If we perform depth-first search then:

a) edge (1,2) is a tree edge;

5. Which statements from the list below are true

a) The topological sort algorithm is based on breadth-first search graph traversal.

6. A following procedure is given: Proc(n){ **if**(condition(x)) **then** { A(x); Proc($f(n)$); B(x) } **else** C(x) }. Let's assume that phrase AAABCC represents triple execution of instruction A, followed by execution of instruction B and then double execution of instruction C. Which of the following sequences can be results of the above-mentioned procedure:

a) AABBC;

7. Graph $G = (V, E)$ is a Binary Search Tree (BST), where $V = \{15, 21, 23, 29, 31, 38, 40, 61, 96, 98\}$, $E = \{(21, 15), (21, 23), (29, 21), (29, 31), (38, 29), (38, 96), (96, 40), (96, 98), (40, 61)\}$.

a) As a result of execution of preorder traversal, the nodes will be visited in a following sequence: 38, 29, 21, 15, 23, 31, 96, 40, 61, 98.

8. Given are n points defining polygon of n edges.

a) There is an algorithm of $O(\log n)$ computational complexity which verifies if a given point lies on one of the edges of the polygon.

9. A dynamic graph, which maximal number of nodes and edges can not be identified during execution of an algorithm, should be represented as

a) node adjacency matrix

10. For the traveling salesman problem, an algorithm calculating optimal solution:

a) does not exist

11. The depth of recurrence for calculation of Fibonacci sequence, implemented recursively, according to arithmetic definition of recurrence is

a) $O(n^2)$

12. Cursor implementation of a list

a) is pointer structure

2 Computer architectures

13. ALU a) Can be a combinational system
14. Using the FPGA system is possible to perform
 - a) For example any combinational system, limited only by the size of the structure FPGA
15. Combinational system is
 - a) A logical system which does not remember previous states
16. Sequential system is
 - a) A logical system which does not remember previous states
17. Random-access memory (RAM)
 - a) Has address inputs, control inputs and input/output of data
18. Dual-port memory ram
 - a) Is a memory ram with two interfaces allowing undependably to get access to the same memory cells
19. Counter
 - a) Synchronous can be constructed of jk flip-flops with NAND gates
20. Processor
 - a) Can be constructed by means of FPGA
21. Instruction set of processor
 - a) The component of instruction set is always multiplication
22. Graphics card
 - a) Can be combinational system
23. Keyboard
 - a) Codes being sent by keyboard are ascii codes
24. Program counter
 - a) Is a counter with parallel input being used only by unconditional jump instructions
25. Instruction of unconditional jump of processor
 - a) Causes saving in program counter of the address of the instruction being about to be executed after the jump undependably on the condition
26. Instruction of conditional jump of processor
 - a) Causes saving in program counter of the address of the instruction being about to be executed after the jump undependably on the condition
27. The processor's instruction performing adding of two numbers
 - a) Causes adding of two numbers, the result is saved in program counter
28. In processor which uses the pipelining
 - a) Performance of single instruction is divided into sequence of simpler stages
29. In superscalar processor
 - a) Is possible to perform simultaneously more than one instruction
30. One-bit adder
 - a) Has only one data input, second input of bit carried in from the previous less-significant position and two outputs: sum and overflow

31. Instruction register
a) Stores address of the instruction loaded from the program's memory
32. The examples of combinational systems are
a) Multiplexer and transcoder
33. The examples of sequential systems are
a) Multiplexer and transcoder
34. Asynchronous communication
a) Sending and receiving systems are synchronized by common additional line with synchronous signal

3 Database Systems

35. Select all true statements concerning the keys in the relational data model.
a) A primary key is always a simple key.
36. Given the relation R , its schema $H = \{A, B, C, D, E, F, G\}$ and a set of functional dependencies $F = \{\{C\} \rightarrow \{A\}, \{C\} \rightarrow \{B, F\}, \{C\} \rightarrow \{G\}, \{E\} \rightarrow \{C\}, \{G\} \rightarrow \{A, B\}\}$, select keys of the relation R .
a) $\{E\}$
37. For which of the following operations of relational algebra, scheme(s) of argument(s) and of the resulting relation are the same?
a) projection
38. Assume that in a query based on two relations we replace internal join operator with an outer join operator. Select these operators, which use guarantees a result not lesser (in the sense of inclusion) than using the internal join operator.
a) left outer join
39. Select cases in which clauses of *select* statements are provided in the correct order.
a) from, group by, where, having
40. Select the elements allowed in the conceptual data model which are not compatible with the relational data model.
a) binary relationships many-to-many
41. Let the relation R , its schema $H = \{A, B, C, D, E, F\}$ and a set of functional dependencies $F = \{\{A\} \rightarrow \{B\}, \{C\} \rightarrow \{D, E\}, \{A, C\} \rightarrow \{F\}\}$ be given. Which of the following decompositions of R relation into relations with schemas H_1, H_2 i H_3 are lossless?
a) $H_1 = \{A, B\}, H_2 = \{C, D\}, H_3 = \{E, F\}$
42. Select all true statements about the Boyce-Codd normal form.
a) Any 2-argument relation is in BCNF.
43. Let the relation R , its schema $H = \{A, B, C, D, E\}$ and a set of functional dependencies $F = \{\{B, C\} \rightarrow \{D, E\}, \{C, D\} \rightarrow \{B, E\}, \{D\} \rightarrow \{C\}, \{E\} \rightarrow \{B\}\}$ be given. Which is the highest normal form of the relation R assuming it is in 1NF?
a) 1NF
44. Select all true statements regarding the third normal form.
a) If all attributes of the relation schema are key attributes, then the relationship is in 3NF.
45. Select all true statements regarding foreign keys in the relational data model.
a) Foreign key values are unique.

46. Select all true statements regarding the usage of aggregate functions in PostgreSQL.
- a) An aggregate function cannot be used inside of a *where* clause unless it is placed in a subquery.
47. Select all true statements regarding transactions.
- a) A transaction is a sequence of operations on a database, which have to be performed altogether or not at all.
48. Select the constraints which can be defined on the column level (in the *create table* statement).
- a) unique values of an attribute
49. Select all true statements regarding the *null* value.
- a) Two null values are treated as equal.

4 Software engineering

50. From among the following, identify the legal data flows in a data flow diagram
- a) process to external entity
51. What is the goal of testing?
- a) demonstrate conformance to requirements
52. What are the main activities in the spiral model?
- a) planning, risk analysis, design, validation
53. What role in UML class diagrams has composition?
- a) it is relation gen-spec between instances of classes
54. The aim of software engineering is to produce software that is
- a) fault-free
55. An example of the risk involved in software development is
- a) key personnel may resign before the product is complete
56. The requirements model consists of four parts
- a) Use cases, interface descriptions, class diagram, project scope
57. Identify the correct statement from among them
- a) data flows in a DFD may be bidirectional
58. Which of the following statements relating to the UML diagrams states are true?
- a) the action is indivisible computational procedure
59. Prototyping is appropriate for
- a) application relies on a framework
60. An initial attempt at defining the pieces/parts of the system and their relationships, organizing these pieces/parts into well-defined layers with explicit dependencies is called
- a) use-case analysis
61. Which of the following tool is not used during system analysis?
- a) Data Flow Diagram

5 Programming languages and techniques

62. How to calculate the length of the text passed as an argument to the following function?

```
1 void foo(const char*txt){
2     ...
3 }
```

a) sizeof(txt)

63. What can you say about the following declaration?

```
1 int t[10]={1,2,[4]=1};
```

a) According to C99 standard it will create an array containing 10 elements, of which 7 will have value of 0.

64. How to calculate the length of the array in the function foo () ?

```
1 void foo(double t[]){
2     // length of the array t?
3 }
```

a) It is impossible to calculate.

65. Which implementation of a function that returns an array is correct?

a)

```
1
2 int [] getTable ()
3 {
4     int tab[10];
5     return tab;
6 }
```

66. Assuming that the size of `char` is one byte, `short` is two bytes, and `double` is eight bytes, what is the value of the expression `sizeof (x)`, where `x` is a variable of the following structure type, when using 64-bit compiler with standard settings?

```
1 struct {
2     char c;
3     short i;
4     double d;
5 } x;
```

a) 1+2+8=11

67. Analyze the following declaration.

```
1 int t[10];
2 int *p1=&t[0];
3 int *p2=&t[8];
```

Which statements are **true** (assume that you are using a 64-bit compiler)?

a) The following instruction will print 8.

```
1 printf("%d\n", p2-p1);
```

68. Examine the following declaration in C:

```
1 int (*x)(int, int);
```

a) The variable `x` is a variable length two-dimensional array of `int *` pointers.

69. Which statements related to the operators in the C/C++ language are correct:

a) Additive operators have lower priority than multiplicative ones.

70. Which statements about `static` modifier in C/C++ are correct :

a) Static modifier preceding a function declaration causes that the function name will not be visible outside the module during linking.

71. Using the C language calling convention known as `__cdecl` it is possible to implement functions with a variable number of arguments, like `printf()`.

a) In the the generated code of function call the arguments are placed on the stack from the end. Thereby, the first call argument is placed the top of the stack and examining its contents, it is possible to determine the expected number of arguments used in the call.

72. How an array is passed as a function parameter in C, e.g.:

```
1 int main(int argc, char* argv[]){
2     //...
3 }
```

a) The entire contents of the array is copied on the stack and the function operates on a copy of the array.

73. Which statements related to memory allocation in C and C++ are true?

a) Memory for all variables is allocated on the stack.

74.
Which of the following statements related to references in the C++ language are correct?

a) References can be `null`.

75. During the execution of the following instruction in C++:

```
1 A* ptr = new A();
```

an exception was generated. Which of the causes are plausible:

a) An error occurred during the object creation and the constructor returned 0.

76. Analyze the following snippet of C++ code, in which there the `<<` operator is called

```
1 A a;
2 std::cout << a;
```

Which of the following implementations of the `<<` operator is correct (sample code will be compiled and executed)?

a) As a method within class A that returns a reference to the stream:

```
1 class A{ public :
2     std::ostream& operator <<( std::ostream&os) const ;
3 };
```

77. The following function template was defined:

```
1 template <class T>
2 T suma(T*table, int size)
3 {
4     T t=T();
5     for(int i=0;i<size;i++)t+=table[i];
6     return t;
7 }
```

Template instantiation process involves replacing the types and variables of template parameters by specific types and values, and then the generation of the target code. What assumptions must meet the type T to make the template instantiation possible?

a) Type T used during template instantiation can be a built-in type (int, char, float, double)

78. Class B stores pointers to objects of class A in the vector container from the C++ standard library (STL)

```
1 class A { ... };
2 class B { public:
3     std::vector<A*> v;
4     void add(A&a) { v.push_back(new A(a)); }
5     ~B();
6 };
```

Which of the destructor implementations are correct (can be compiled, does not lead to a runtime error or memory leaks)?

a)

```
1 B::~~B() { }
```

79. The set<T> template defined in the C++ standard library (STL) stores elements in a tree structure. Which of the listed below data types may be used as an instantiation parameter of the set<T> template?

a) double

80. Which of the following statements related to copy constructors and assignment operators in C++ are correct?

a) The standard implementation (automatically generated by the compiler) of C++ copy constructor copies successive bytes that make up the memory of an object.

81. Implementations of overloaded C++ operators should reflect the semantics of operations on built-in types. Given this requirement, which of the operator implementation for the declared below class X is correct?

```
1 class X
2 {
3 friend X&operator+=(X&a, const X&b);
4     int x;
5 public:
6     X(int _x=0):x(_x){ }
7     X&operator+(const X&o);
8     X&operator++(int);
9     X&operator--(const X&o);
10 };
```

a)

```
1 X&X::operator+(const X&o){ x=x+o.x; return *this; }
```

82. Which of the following operators in C++ allow to access information about the type of the object during the runtime:

a) static_cast

83. Two classes were declared as follows:

```
1 class A{
2 public:
3     virtual void f(){ printf("VA ");}
4     void g(){ printf("A ");}
5 };
6
7 class B:public A{
8 public:
9     void f(){ printf("VB ");}
```

```
10 void g(){ printf("B ");}
11 };
```

and two objects were created:

```
1 A* a1 = new A();
2 A* a2 = new B();
```

Which of the statements are true?

a) The following call

```
1 a1->f();
2 a2->f();
```

will result in printing VA VB

6 Web languages and technologies

84. Select correct statements. A packet path between two nodes in the Internet (a list of nodes the packet visits):

a) depends on the dynamic routing

85. A DNS translates

a) symbolic names to IP addresses

86. Select correct statements. The HTTP 1.1 protocol

a) is stateless

87. Which tools can be used to directly communicate with a web server?

a) telnet

88. Which statements regarding XHTML 1.0 Strict code given below are true?

```
1 <p><a href=http://www.agh.edu.pl><br></p>
```

a) It is valid.

89. There is the following XHTML 1.0 Strict code.

```
1 
```

The image *i.jpg* is 1024x768. Which statements are true?

a) The browser will scale down the image.

90. How many CSS resources for a single XHTML 1.0 Strict document there could be?

a) One.

91. Choose correct statements regarding the following CSS 2.1 code.

```
1 .nav > div {
2 color: white;
3 background: #119500;
4 float: right;
5 width: 120px;
6 padding: 1px;
7 font-size: small;
8 border: solid red 1px;
```


9 }
}

a) It regards all *div* descendants of elements which belong to the *nav* class.

92. Select correct statements in regard to the following PHP code.

```
1 $fp = fopen("plik_do_blokowania", "r+");  
2 if (flock($fp, LOCK_EX)) {  
3     processing();  
4     flock($fp, LOCK_UN);  
5 } else {  
6     problem();  
7 }  
8 fclose($fp);
```

a) The *processing()* function is called within the critical section.

93. There is a form given below which content is sent to a PHP script. Select correct statements.

```
1 <form action="skrypt.php" method="post"  
2     enctype="multipart/form-data">  
3     <p>  
4         <input type="file" name="plik" />  
5         <input type="text" name="comment" />  
6         <input type="submit" value="wyslij" />  
7     </p>  
8 </form>
```

a) `$_POST['comment']` holds the text input value.

94. What does the following code do?

```
1 <?php  
2 $wiek=array('ala' => 12,'ela' => 22,'franek' => 54);  
3 foreach ( $wiek as $k => $w )  
4     echo $k.' '. $w." \n";  
5 ?>
```

a) There will be three lines on the standard output; a line is a byte sequence which ends with a new line character.

95. How long would it take to run the following PHP code? It is assumed that the script is run as a web application at some URI and the PHP interpreter is run by a web server.

```
1 <?php  
2     echo 'start';  
3     sleep(6);  
4 ?>
```

a) Exactly 6 seconds.

96. Which of the following methods return an element indicated by a unique identifier in JavaScript?

a) `document.getElementById('form')`

97. What is an outcome of the following JavaScript code if it is properly placed between other elements in a XHTML document?

```
1 car=new Array();  
2 car[0]=new Object();  
3 car[0].make='Fiat';  
4 car[0].vin='123';
```

```

5 car[1]=new Object();
6 car[1].make='Ford';
7 car[1].vin='456';
8
9 for ( idx in car ) {
10     for ( prop in car[idx] ) {
11         document.write( car[idx][prop] );
12     }
13 }

```

a) There will be a string *Fiat123Ford456* placed where the code is.

98. Select correct statements regarding the following JavaScript code.

```

1 function updateAjax () {
2     xmlhttp = new XMLHttpRequest();
3     xmlhttp.onreadystatechange = function () {
4         if ( xmlhttp.readyState==4 && xmlhttp.status==200) {
5             document.getElementById("stime").innerHTML=xmlhttp.responseText;
6         }
7     }
8     xmlhttp.open("GET","date.php",true);
9     xmlhttp.send();
10    window.setTimeout("updateAjax()",1000);
11 }
12 window.setTimeout("updateTime(); updateAjax();",5000);

```

a) There is a synchronous AJAX connection programmed.

99. There is an XML document and a corresponding DTD. Select correct statements.

a) The DTD is not required to check if the document is well formed.

7 Numerical methods

100. In a hypothetical binary floating-point arithmetic system, negative numbers are represented within an interval: $\langle -b, -a \rangle$. We want to represent a number smaller than $-b$ and having infinite continued fraction so we use instead nearest number represented in the considered system. What kind of numerical error we obtain?

a) Truncation error

101. A necessary and sufficient convergence condition for an iterative method solving a linear system of equations (like Jacobi method or Gauss–Seidel method) is:

a) The spectral radius of the iteration matrix is less than 1.

102. Which of the following methods are direct methods for solving linear systems?

a) Jacobi method

103. Which of the following methods use properties of polynomial interpolation.

a) The secant method, and Newton's method for root-finding problem.

104. The condition numbers of Hilbert matrices are very high, so we can say that:

a) The Hilbert matrices are well-conditioned matrices.

105. Which of the following conditions must a cubic spline interpolant satisfy (at the interpolation points)?

a) The interpolating function goes exactly through the interpolation points.

106. Which of the following statements (regarding polynomial interpolation using a monomial basis) are true?

- a) Polynomial interpolation with monomial basis is a well-conditioned problem.
- 107.** How do we call errors that arises from taking a finite number of steps in a computation to approximate an infinite process?
a) Rounding errors
- 108.** If a small change in the input argument results in a small change of the output value of the function:
a) The problem is well-conditioned.
- 109.** The bisection method (root-finding method) is guaranteed to converge to a root of function $f(x)$ in interval $[a, b]$ if:
a) Function $f(x)$ is a continuous function on the interval $[a, b]$.
- 110.** Newton method for finding roots of function $f(x)$ in interval $[a, b]$, sufficiently close to the root, has the rate of convergence:
a) Quadratic
- 111.** In numerical analysis, the Newton–Cotes quadrature rules are a group of formulae for numerical integration. Which of the following methods/rules belongs to group of basic Newton–Cotes quadrature.
a) Euler method
- 112.** Runge’s phenomenon is a problem that occurs in which of following interpolation methods?
a) Spline interpolation using polynomials of degree 1 and using nodes that are distributed equidistant on the interval.
- 113.** In linear algebra, Gaussian elimination is an algorithm for solving systems of linear equations. Which of the following statements regarding the Gaussian elimination are true?
a) The Gaussian elimination is an iteration method.
- 114.** To prevent or minimise Runge’s phenomenon in the interpolation task one can apply:
a) Spline interpolation rather than interpolation based on Lagrange polynomials

8 Programming of microcontrollers and microprocessors

- 115.** What addressing mode is used in instruction `ADDL (%ebx),%eax`?
a) immediate
- 116.** Which instruction is equivalent in operation to `SHL $1,%eax` instruction?
a) `SHR $1,%eax`
- 117.** Which rule can be used for conversion to an integer number in FPU (Floating Point Unit)?
a) round to nearest
- 118.** How many times (in 32-bit mode) a loop based on `LOOP` instruction will be repeated, if the content of `%ecx` register is equal to 0 just before the start?
a) 0
- 119.** How many times (in 32-bit mode) the content of `%ah` register will be stored to memory using `REP STOSB` instruction, if, before its execution, the content of `%ecx` register is equal to x ?
a) 0
- 120.** What will be the content of the `%eax` register after a sequence of following instructions?

1	<code>MOVL \$0xFFFF0000,%eax</code>
2	<code>NEG %eax</code>

a) 0x00000000

121. What will be the content of the %al register after a sequence of following instructions?

```
1 MOVW $0xFF00,%ax
2 ADCB %ah,%al
3 ADCB %ah,%al
```

a) 0x01

122. What kind of diagram shows the electrical connections in the microcontroller based system?

a) block diagram

123. What kind of microcontroller memory typically stores user program code?

a) DRAM

124. Which parts of microcontrollers do not exist in microprocessors?

a) DRAM

125. Is the machine language identical with the assembly language?

a) yes - only for microcontrollers

126. What tool is used to convert code written in assembly language into machine code?

a) assembler

9 Concurrent and distributed programming

127. Mark correct functional object definition in Erlang.

a) F1 = fun(X) = X+1 end.

128. Mark value of a given Erlang expression: [1,2,3] -- [3,2,3,5].

a) [1]

129. Erlang type system is:

a) dynamic - checked during compilation

130. How to make an Erlang process executing F1 function?

a) Pid is spawn_exec(F1).

131. How to send a message to Erlang process with a given PID?

a) Pid send Mesg.

132. Which communication model is used in Erlang?

a) shared memory

133. Erlang interprocess communication is based on:

a) rendezvous

134. Value of the given Erlang expression is: lists :map(fun(X) -> {X,X+1} end,[1,2,3])

a) {{1,2},{2,3},{3,4}}

135. What is the purpose of the protected object in Ada language?

a) Speedup code execution.

136. How to denote parameter direction in Ada language?

a) Symbols -> and <- in declaration.

137. Type system in Ada is?

a) optional

138. How tasks communicate in Ada?

a) FIFO queue.

10 Computer networks

139. A version 4 IP broadcast address for IP network that includes host 110.104.1.10 and has a mask of 255.0.0.0, is:

a) 110.104.1.0

140. An IP datagram field called "Time to live", that prevents from packet routing loops, has a value expressed in:

a) Time in seconds, in which an IP packet can still be forwarded.

141. The name of frame used in IEEE 802.11 technology and send by an Access Point device for information broadcasting about wireless network, is: a) Link

142. UDP protocol port number identifier, send in each UDP datagram, has a bit-length of:

a) 8 bits

143. An IPv6 value (together with mask) indicating all hosts in the Internet, is:

a) ::/0

144. The IP routing rule called 'Longest prefix match' will cause, that IP datagram destination address of 200.200.200.1 in an IP routing table consisting prefixes (CIDR notation): 200.200.200.0/18, 200.200.200.0/20, 200.200.200.0/22, 200.200.200.0/24 will be fixed to:

a) 200.200.200.0/18

145. The maximum IPv4 packet length (in bytes), is:

a) 1500

146. MPLS (MultiProtocol Label Switching) router, that receives MPLS-labelled packets from another one, is called:

a) Designated router

147. iBGP (internal Border Gateway Protocol) router, that allows to reduce iBGPs sessions number between BGP routers (allows to avoid use of iBGP Full-mesh topology), is called:

a) BGP Mirror

148. A number of CoS (Class of Service) classes, defined by a basic QoS (Quality of Service) mechanisms (IEEE 802.1p) in the Ethernet, is:

a) 255

149. A variant of STP (Spanning Tree Protocol, IEEE 802.1d), that allows use of Ethernet VLAN (Virtual LAN) spanning tree aggregation (using the same spanning tree for whole group of VLANs), is called:

a) PVSTP (Per VLAN Spanning Tree Protocol)

150. Kinds (groups) of physical devices defined in a ZigBee technology, are:

a) Switch Fabric, ZigBee Matrix

151. The name of routing information migration process between different dynamic IP routing protocols in IP routers is:

a) IP Forwarding

- 152.** Symbols (acronyms) for popular kinds of fiber-optics cable plugs in computer networks, are:
a) RT, RR, LT
- 153.** What is defined by the IEEE 802.1Q standard?
a) Private VLANs over Ethernet.
- 154.** A protocol, allowing remote host IP address translation to a host MAC address, is called:
a) MLD (Multicast Listener Discovery)
- 155.** What kind of information is placed in Extended Unique Identifier (EUI) field of an IPv6 address?
a) A correspondent IP version 4 address of a host.
- 156.** A default Administrative Distance value in an IP routing table (Cisco, Juniper, Hewlett-Packard) for a RIP (Routing Information Protocol)-originated rules is:
a) 15
- 157.** In a Fibre Channel (deployed in SAN networks) a Switch Fabric port, capable of working in an Arbitrated loop topology, has a type of:
a) E
- 158.** Two sub-layers defined inside ISO-OSI model layer 2, are:
a) LLC (Logical Link Control) and MAC (Media Access Control)
- 159.** An Effective Isotropic Radiated Power (EIRP) of a wireless device transmitter (expressed in dBm) can be calculated from power in Watts with a use of following formula:
a) $EIRP = 1 / (P * 1mW)$
- 160.** A RACK standard network device height unit, equivalent to 1.75 inch (or about 44.45 mm), is marked with:
a) h
- 161.** A kind of network area in an OSPF (Open Shortest Path First) dynamic IP routing protocol domain, which doesn't receive any kind of external IP routes, is called:
a) internal
- 162.** A parameter called "Window size", transmitted in a TCP (Transmission Control Protocol) acknowledgment datagram, is used to:
a) announce a length of next datagram to be transmitted, as well as all subsequent ones.
- 163.** Two kinds of network areas defined in an IS-IS (Intermediate System to Intermediate System) dynamic IP routing protocol, are:
a) stub and backbone

11 Operating systems

- 164.** Which statement is true about associative memory?
a) Data address is generated by the processor
- 165.** To avoid time dependent errors, the maximum number of processes that may be inside the critical section is
a) 8
- 166.** The strategy, which allows a process that meets the execution conditions be temporarily suspended, is called:
a) preemptive scheduling

- 167.** The privilage instruction:
a) is used in the systems without the interruption mechanism
- 168.** Inter-process communication:
a) is required for all processes
- 169.** Within the virtual memory organization, the dynamic address translation:
a) requires hardware support for paging system
- 170.** Initial value of the general semaphore that implements the critical section is:
a) -1
- 171.** The process of transferring the data, which will be finally routed to a peripheral device, to the secondary storage and transferring them to the device at a more convenient time is called:
a) multiprogramming
- 172.** Producer-consumer problem can be solved by using:
a) semaphores
- 173.** The CPU, after receiving information about the interruption from the I/O devices
a) stops for a specified period of time
- 174.** Which of the following problems does the Dijkstra's Banker's algorithm solve?
a) mutual exclusion
- 175.** If the virtual address in the program is 16 bit and the page size is 0.5 K, what is the maximum number of pages we can address?
a) 16
- 176.** The operating system is:
a) hardware routines collection
- 177.** In the memory management system, DATUM and LIMIT registers...
a) mark the beginning and end of the program
- 178.** If the operating system wants to execute more than one program at a given time, it has to:
a) have virtual memory
- 179.** Public key encryption within asymmetric encryption
a) allows anyone to encode a message
- 180.** Files buffering is realized in order to:
a) increasing the efficiency of access to the auxiliary memory