1) Basic equation of the relational database processing is:
A) DBS = DBMS + RQBE
B) DBS = DBMS + DB
C) DBS = DBMS + SD
D) DBS = DBMS + SQL
E) none of the previous answers A, B, C, D is correct

2) Data normalization technique eliminates in the relational database processing
A) redundancy of tables
B) data redundancy
C) redundancy of records
D) redundancy of views
E) none of the previous answers A, B, C, D is correct

3) Low level assembly language is:
A) C
B) Java
C) Python
D) Smalltalk
E) None of the previous answers A, B, C, D is correct

4) Unlike non-object programming languages, each object oriented programming language must have:
A) Graphical user interface
B) Support for Mac OSX operating system.
C) Libraries for working with relational databases.
D) Libraries for working with .NET Framework.
E) None of the previous answeres A, B, C, D is correct

5) Difference between class and collection:
A) Collection is a grouping of objects.
B) There is no difference, both are the same thing.
C) Each class contains a collection.
D) Collections are not used in object programming.
E) none of the previous answers A, B, C, D is correct

6) Object programming:
A) requires MS Windows
B) utilizes principles of modern databases
C) is based on principles of UNIX/Linux/MacOS
D) requires graphical user interface
E) none of the previous answers A, B, C, D is correct

7) What is used to describe the data structure of an entity?
A) Relationships with other entities.
B) Data flow diagram.
C) Atributes.
D) Cardinality markers.
E) None of the previous answeres A, B, C, D is correct

8) What is the system life cycle?
   A) Critical analysis of the system performance.
   B) Cyclical changes to the features of the system.
   C) Sum of all costs related to the system.
   D) Sequence of typical steps during the creation of the system, from initial idea to deployment
   E) None of the previous answers A, B, C, D, is correct

9) Process in data flow diagram is:
   A) an analytical tool
   B) a tool for expressing control flows in the system
   C) a way of finding the system requirements
   D) where the data transformation takes place
   E) None of the previous answers A, B, C, D is correct

10) An item in the Unix file system directory consists of:
   A) filename and all relevant system information about the file
   B) filename and the pointers to those file system blocks, in which the file is stored
   C) filename and the access rights to the file
   D) filename and its i-node number
   E) none of the previous answers A, B, C, D is correct

11) In Unix you translate and run the following program:
```
main()
{    fork();
     fork();
     while(1);
}
```
   A) 4 processes are created and they will be in the blocked state
   B) 4 processes are created and they will be in the ready to run state or in the running state
   C) 2 processes are created and they will be in the running state
   D) 1 process is created in the blocked state
   E) none of the previous answers A, B, C, D is correct

12) Unit testing:
   A) is a way of testing the functionality of small parts of the application (methods, classes)
   B) testing method conducted by teams (units) of testers
   C) is a way of testing the functionality of the application as a whole
   D) is in no way related to software development
   E) none of the previous answers A, B, C, D is correct

13) State of the object:
   A) describes the data part of the object (particular data values stored inside it)
   B) can be used to determine if two objects are identical
   C) represents the behaviour of the object
   D) allows inheritance
   E) none of the previous answars A, B, C, D is correct

14) Which of the following statements is INCORRECT?
   A) Each object has its own identity
   B) State describes the data inside the particular object
   C) Attributes declared as private cannot be accessed from outside the object.
   D) Object doesn't contain any data, just methods.
   E) None of the previous answers A, B, C, D is correct.

15) Liskov substitution principle says that:
   A) where an instance of a class T is expected, an instance of any of class T's subclasses can be used and the functionality of the application does not change
   B) each object can be replaced by any other object
   C) methods of one object can be replaced by overriden version of the method from a superclass
   D) we cannot send multiple messages to one object
   E) none of the previous answers A, B, C, D is correct.

16) We have a number X = $(147)_{10}$ in a decimal numeric system. In a octal numeric system a value of the X number is:

A) This number cannot be represented in octal numeric system
B) $(18,375)_8$
C) $(147)_8$
D) $(223)_8$
E) None of the previous answers A, B, C, D is correct

17) Let us have the following statements:
„Mates is sad or has a bad mood."
„Mates is not sad."
From the statements logically follows …

A) … statement „Mates has not a bad mood."
B) … statement „Mates is sad and has a bad mood too."
C) … statement „If Mates is not sad, he has not a bad mood."
D) … statement „Mates has a bad mood."
E) none of the previous answers A, B, C, D is correct

18) We have a logic circuit with inputs a_i, b_i, c_i and outputs c_{i+1} a s_i. In the table below there is a description of circuit behaviour. The circuit is:

a_i	b_i	c_i	c_{i+1}	s_i
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

A) decoder 2x4
B) parity generator
C) a 1-bit arithmetic adder
D) sequential J-K circuit
E) none of the previous answers A, B, C, D is correct

19) We have a logic circuit which represented PROM 4x3. The content of this memory is (address: content):
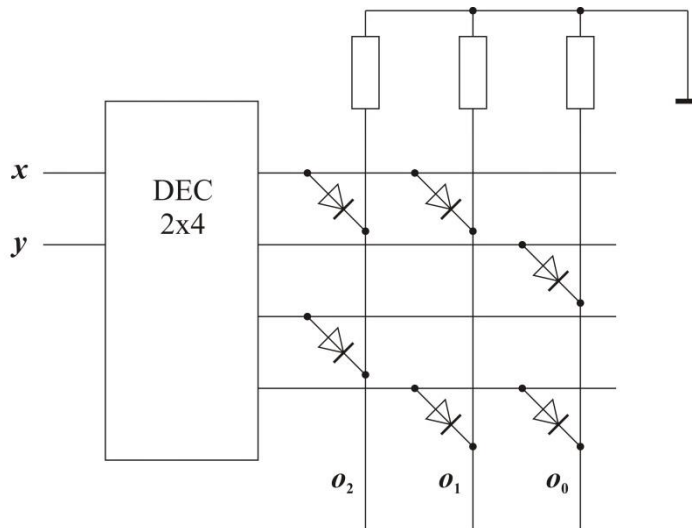
A) 00:02, 01:01, 02:01, 03:02
B) 00:02, 01:02, 02:02
C) 00:0A, 01:09, 02:05
D) 00:06, 01:01, 02:04, 03:03
E) none of the previous answers A, B, C, D is correct

20) The simplified conjunctive normal form (CNF) of the Boolean function f (see table) is:

x	y	z	f
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

A) $xz' + y'z$
B) $(x + z)(y' + z')$
C) $xy + y'z'$
D) $(x' + z)(y' + z)$
E) none of the previous answers A, B, C, D is correct