

Name: _____
Time: 60mins

Class : ____ ()

Date: _____

Open Book Test

If there is any error, write down the corresponding error.

1. A sequence $\{F_n\}$, $F_1 = 1$, $F_2 = 1$, $F_n = F_{n-1} + F_{n-2}$, for $n > 2$, where n is positive integer.
Write a program to find F_n , $1 \leq n \leq 20$.

Sample : (*Italic words are inputted by the user*)

Enter a number (1-20):3 F3 = 2

```
program f1;  
var I,A,B:longint;  
begin  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
end.
```

You cannot declare any more variables.

2. What is the output of the program:

Program Q2; Var I,j:integer; Begin For I:=1 to 4 do begin For j:=1 to 4 do Write((I+j-2)mod 5 +1, ' '); Writeln; End; End.

3. Read the following program carefully:

```
Program Q3a;  
Var a,b,c:integer;  
Begin  
Readln(a,b,c);  
Writeln((a+b+abs(a-b))); {*}  
End
```

a) By modifying and adding one arithmetic operator and number in the line marked {*} so that the program returns the smaller one of a and b.

b) Modify {*} so that it returns the greatest one of a , b and c.

4a. This program is to output the a^b number:

```
var a,b:integer;  
begin  
readln(a,b);  
writeln( _____ A _____ );  
end.
```

What should A be?

b. An integer-array A, storing (9, 5, 23, 6, 2, 65, 4, 27, 2).
This program is to sort A in ascending order. (*All variables are well defined.*)

```
For j:=1 to 9 do  
Begin  
A_Part_Of_Sorting_Procedure_Either_Bubble_Insertion_Selection;  
If j=3 then  
begin  
For k:=1 to 8 do write(a[k], ' ');  
writeln(a[9]);  
end;  
end;
```

Write down the sorting algorithm used if the following output is :

“5 9 23 6 2 65 4 27 2” _____

“2 2 4 6 9 65 23 27 5” _____

“5 2 6 4 9 2 23 27 65” _____

5. Consider the following program :

Line 1	Program Q5;
Line 2	Var I,j,k:integer;
Line 3	begin
Line 4	For I:=1 to 32767 do
Line 5	For j:=1 to 30 do
Line 6	For k:=1 to 10 do write('*');
Line 7	End.

- (a) How many stars "*" are printed?
 (b) Add one semi-colon (;) only in line 4,5 or 6 so that there is/are:
 (i). 10 stars only
 (ii). 300 stars only
 (iii). 1 star only
 (c) Add only a pair of brackets "{ }" at one line of the program so that there is no star printed.

Line 4	For I:=1 to 32767 do
Line 5	For j:=1 to 30 do
Line 6	For k:=1 to 10 do write('*');

- (d) Given a computer needs 1 second to print a star and 1 second to run the loop "for k:=1 to 1 do;"

How many seconds does the computer need to print

- (i). 0 star using the program in **c**
 (ii). 10 stars using the program in **b(i)**
 (iii). 1 star using the program in **b (iii)**

	Answer
5a	
bi	
bii	
biii	
di	
dii	
diii	

6. The output of procedure n(lev) is shown as follows:

```

Procedure n(lev:integer);
Begin
If lev>0 then n(lev-3)
Else if lev<0 then n(lev+2);
Write(lev);
End;
    
```

N(lev)	Output of N(lev)
N(0);	0
N(1);	0-21
N(2);	0-21-12
N(-1);	0-21-1
N(-2);	0-2

Write down the output of:

N(7);	
N(8);	
N(7);N(-7);writeln;N(8);	
N(0);writeln('N(2)');N(-2);writeln;N(1);	

Question 7a: (Circle Correct Answer)

If p,q,r are Boolean , what is the outputted value?

```
writeln(((p and q) or (q and r) or (q and not p)) and (p and not(q or not r)));
```

TRUE / FALSE / Cannot be determinated / Syntax error

Question 7b: (Circle Correct Answer)

Which of the following statement is always equal to FALSE ? (var x,y,z:Boolean)

- A. $(ord(x)+ord(y)+ord(z)=2) = (x \text{ xor } y \text{ xor } z)$
- B. $(ord(x)+ord(y)+ord(z)=3) = (x \text{ or } y \text{ or } z)$
- C. $(ord(x)+ord(y)\geq 1) \triangleleft (x \text{ or } y \text{ and } z)$
- D. $(ord(x)+ord(y)+ord(z)\leq 3) \triangleleft (x \text{ or } y \text{ or } z \text{ or } (z \text{ xor } not\ z))$
- E. $(ord(x)+ord(y)+ord(z)=2) = (x \text{ xor } y \text{ and } x \text{ xor } z)$

Question 8:

```

Program Q8;
Var I,j,k:integer;
Begin
I:=1;
For j:=1 to 10 do
For k:=1 to j do
I:=I+1;
End.
    
```

What is the value of i after the end of the program? _____

- 11) Read the following program carefully:

```
Var a:array[1..10] of integer;  
    I,j,count:integer;  
Begin  
For I:=1 to 10 do a[I]:=I;  
Count:=0;  
For j:=1 to 10 do  
For a[j]:=1 to 10 do  
For I:=1 to a[j] do inc(count);  
Writeln(count);  
End.
```

How many lines are there in the output? _____

actually, understanding questions is also a practice...even in OI, the questions may not be so clear....XD
(By one of your shadow trainer)

End of Paper