Name: $\qquad$
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## Algorithms and basics of programming

Test
XX December 2023

Time frame: 45 minutes.

1. What is the output of this algorithm in the case of the following inputs? (5 points)

| input |  | output |
| :---: | :---: | :---: |
| $\mathbf{A}$ | $\mathbf{B}$ |  |
| 6 | 6 |  |
| 2 | 3 |  |
| 3 | 2 |  |
| 5 | 3 |  |
| 125 | 81 |  |

```
function QWERT(C)
    A = 0
    while C>0 do
        if (C%2)==0 then
            A = A+C
        else
            A = A-C
            endif
        C = C-1
    enddo
    return A/2
end function
input A
input B
output QWERT(2*A+2*B)
```

2. The following algorithm has several problems. Give 3 test cases when we cannot apply this code due to the following different kinds of problems. ( 6 points)
input $a, b, c$
if $b>=0$ then
while $\mathrm{b}!=0 \mathrm{do}$
$\mathrm{c}=\mathrm{c}+1$
$\mathrm{b}=\mathrm{b}-2$
output c
enddo
else
$d=(a+b) /(c+a)$
output d/b
endif

| nature of problem <br> (in case of the given input |  |  | input |
| :--- | :--- | :---: | :---: |
| the algorithm does not <br> terminate (infinite) |  |  |  |
| algorithm causes runtime <br> operation error |  |  |  |
| code terminates, but does not <br> provide any output |  |  |  |

3. Write an algorithm with pseudocode, which contains a function definition having 3 parameters! The function returns by 0 if any of the 3 parameters is 0 . If all the parameters are different from 0 , it returns an arbitrary non-zero value. Call the function by parameters given by the user and display the result in the main program unit. (7 points)
4. Write an algorithm with pseudocode, which prints the smallest prime number which is greater than the positive integer value given by the user. (10 points)

5. Write an algorithm with pseudocode, which rearrange the $N$ integer elements of an already initialized array called A. After the rearrangement the evennumbers must be at the beginning of the array while the odd values must be at the end of the array (after the even values). (12 points)

