A.(a) i $u = (2*a)/b - b/(2*a)$ ✓

A.(a) ii $z = Math.pow(Math.sqrt(x+y)/(Math.pow(x,n)+Math.pow(y,n)-1), n)$ ✓

A.(b) i $x=4$

$(x+5)\%3 + y*2 = (2.0+5)\%3 + 6*2 = 7.0\%3 + 12$

$= 1.0 + 12 = \boxed{13.0}$ (-3)

A.(b) ii $(y/x + x*m) * (y\%x) = (6/4 + 4*2.0) * (6\%4)$

$= (1+8.0) * (2) = 9.0 * 2 = \boxed{18.0}$ ✓

B.(a) first blank: new Scanner (System.in) ✓

second blank: next Double() ✓

third blank: %.4f ✓

B.(b) 1,2,3,5,4,6 and ✓

2,1,3,4,5,6 ✓

C.(a)ii The expressions !(A&&B) and !A&&!B are not logically equivalent. This is because they are not equal for every possible value pair of A and B. For instance, if A was true and B was false, !(A&&B) would evaluate to true and !A&&!B would evaluate to false. ✓

C.(b) !(A&&B)||(A&&B) ✓

D(a) The maximum number is 7
This occurs when $x = -1$ and $y = -1$.

D(b) The code segment in Listing 2 is suboptimal because it checks both x and y at a time instead of doing one by one, causing unnecessary comparisons. For example, it occurs when $x = 1$ and $y = -1$. The relational expression $(x < 0 \;\&\&\; y > 0)$ on line 5 is calculated unnecessarily. We know from line 3 that since $x \geq 0$ is true and $y > 0$ is false, so it should be 4th quadrant already.

D.(c) $\bar{E} = \frac{2+4+5+7+6}{5} = \frac{24}{5} = \boxed{4.8}$

$\frac{25}{5} = 5$

D.(d)

```
if (x==0 || y==0){
    System.out.println("(x,y) is on an axis");}
else if (x>0){
    if (y>0){
        System.out.println("(x,y) is in the 1st quadrant.");}
    else{
        System.out.println("(x,y) is in the 4th quadrant.");}}
else{
    if (y>0){
        System.out.println("(x,y) is in the 2nd quadrant.");}
    else{
        System.out.println("(x,y) is in the 3rd quadrant.");}}
```

D.(e)

# of Relational Expressions	Branch of If-Statement
1 or 2	1st (line 2)
4	2nd (line 5)
4	3rd (line 7)
4	4th (line 10)
4	5th (line 12)

$\bar{E} = \frac{2+4+4+4+4}{5} = \frac{18}{5} = \boxed{3.6}$

$\frac{19}{5} = 3.8$

-1