Name: _____

CS 145 Images and Imagination

Exam 1

Score:

1. (max 6) _____
2. (max 6) _____
3. (max 12) _____
4. (max 39) _____
5. (max 12) _____
6. (max 8) _____
7. (max 8) _____

Total: (max 91) _____

Score based on a scale of 100: _____

1. (2 pts each, 6 pts total) The following Processing code draws a bright blue rectangle.

```
colorModel(HSB,100);
fill(65,100,100) ;
rect(0,0,100,100);
```

Suppose you are given the following options for replacing the above fill command:

a. fill(100,100,100);
b. fill(65, 100, 30);
c. fill(65, 30,100);
d. fill(90,65,100);

i. Which option(s) will result in a light blue rectangle? _____
ii. Which option(s) will result in a deep, dark blue rectangle? _____
iii. Which option(s) will result in a color that is not blue? _____

2. (2 pts each, 6 pts total) The following Processing code also draws a rectangle.

```
colorModel(RGB,255);
fill(0,0,0) ;
rect(0,0,100,100);
```

Suppose you are given the following options for replacing the above fill command:

```
a. fill(0,0,0);
b. fill(255,255,255);
c. fill(0,100,0);
d. fill(0,0,255);
e. fill(255,0,0);
f.  fill(125,125,125);
```

i. Which option will result in a white rectangle? _____
ii. Which option will result in a gray rectangle? _____
iii. Which option will result in a red rectangle? _____

3. (3 pts each, 12 pts total) Given the following options for drawing a line in Processing:

   a. `line(width/2, 0, width/2, height);`
   b. `line(0, width/2, 0, height, width/2);`
   c. `line(height/2, 0, height /2, width);`
   d. `line(0, 0, width/2, height/2);`
   e. `line(width,0, 0, height);`
   f. `line(0, height/2, width, height/2);`
   g. `line(width, 0, width, height);`
   h. `line(0, 0, width, height);`

   i. Which option (if any) will draw a horizontal line across the middle of the window? _____

   ii. Which option (if any) will draw a vertical line down the middle of the window? _____

   iii. Which option (if any) will draw a diagonal line from the top left to the bottom right of the window? _____

   iv. Which option (if any) will draw a diagonal line from the top right to the bottom left of the window? _____

4. (3 pts each, 39 pts total) For each loop shown on the next page, give one of the following answers:
   - Infinite : If the loop loops forever (thus producing no picture).
   - Not shown: If the picture of the loop is not one of the options shown.
   - #n: Where n is the number of the image generated by that loop. The numbers are shown in the bottom right corner of each image (#1 to #11).

   For all, assume the size and color of the window is set using *only* the following commands:

```
size(120,100);
background(175);
```

Be very careful, take your time – these can be tricky!

____ a)
```
for (int i = 0; i < width; i=i+20) {
   rect(i, i, 10,10);
}
```

____ b)
```
for (int i = 0; i > width; i=i-20) {
   rect(0,0, i,i);
}
```

____ c)
```
for (int i = 0; i < width; i=i+20) {
   rect(0,i, 10,10);
}
```

____ d)
```
for (int i = width; i > 0; i++) {
  rect(0,0, i,i);
}
```

____ e)
```
for (int i = 0; i < width; i=i+20) {
   rect(0,i, i,10);
}
```

____ f)
```
for (int i = 0; i < width; i=i+20) {
   rect(0, i, width-i,10);
}
```

____ g)
```
for (int i = 0; i < 5; i=i+1) {
   rect(20*i, 0, 10,10);
}
```

____ h)
```
for (int i = height; i > 0 ;i=i-10) {
   rect(0, 0, i,i);
}
```

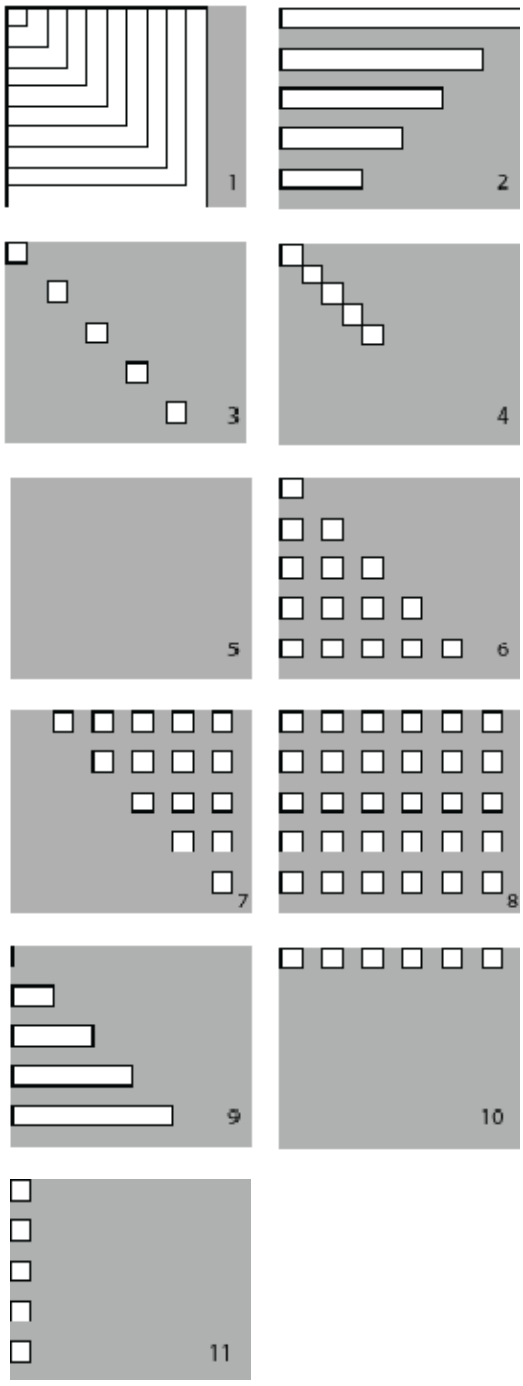
____ i)
```
for (int i = 0; i < width; i=i+20) {
   rect(0,0, i,i);
}
```

____ j)
```
for (int i = 0; i < 5; i=i+1) {
   rect(10*i,10*i, 10,10);
}
```

____ k)
```
for (int i = 0; i < width; i=i+20) {
   for (int j=i; j < height; j=j+20) {
       rect(i,j, 10,10);
   }
}
```

____ l)
```
for (int i = 0; i < width; i=i+20) {
   for (int j=0; j < height; j=j+20) {
      rect(i,j, 10,10);
    }
}
```

____ m)
```
for (int i = 0; i < width; i=i+20) {
   for (int j=0; j < i; j=j+20) {
      rect(i,j, 10,10);
   }
}
```



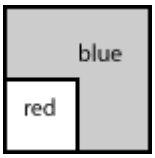
5. (4 pts each, 12 pts total) Suppose you have code that draws a rectangle in a random place in the window (see code below). You want the rectangle's fill color to depend on its randomly chosen location (i.e. x,y). To set the color, you decide to use a conditional statement (e.g. if-else). What would this conditional statement have to be in order to set the color as follows.

   a. The rectangle will have a blue fill color if its (x,y) position falls in the *lower half* of the window, and red otherwise.

```
int x = random(width);
int y = random(height);
// add your code here:
```


```
rect(x,y,20,20);
```

   b. The rectangle will have a red fill color if its position falls in the *lower left quadrant* of the window, and blue otherwise.



   c. The rectangle will have a red fill color if its position falls in the *top third*, green in the *middle third*, and blue in the *bottom third*.

6. (2 pts each, 8 pts total) Assuming n is declared and initialized as:

```
int n = 0;
```

What is the value of the variable n after each the following commands (or indicate if the command triggers an error.)

i. `n = 2 * n;` _____

ii. `n = 2 + 3 * 8;` _____

iii. `n = 3/6;` _____

iv. `n = 20 % 3;` _____

7. (8 pts) Identify all lines which would generate an error when running the code.

```
Line 1.       int s = 300.0;
Line 2.       float b = 100.0;
Line 3.       b = random(255);
Line 4.       background(50,50,50);

Line 5.       void setup() {
Line 6.         size(s,s);
Line 7.         float r = random(255);
Line 8.       }

Line 9.       int w;
Line 10.      void draw() {
Line 11.        w = 40;
Line 12.        fill(r,0,b);
Line 13.        rect(mouseX, mouseY, w, w);
Line 14.      }
```

Answer: _____