MKS21QA Fall 2016 Final Exam

Write your name and period on the separate solution sheet. **Write all of your answers on the separate solution sheet.** You may use this question sheet as scrap paper -- it will be collected but not graded. This is a 50 point test, with 4 points extra credit.

1. [3pts] What value will be printed by the following commands? (choose the best answer)
```
Let a [12  5  3  45]
Let i 0
Let answer item 0 a
Repeat length a [
      If (item i a) < answer [set answer item i a]
      Set i i + 1
]
Print answer
```

   A) 0   **B) 12**   **C) 5**   **D) 3**   **E) 45**

2. [3pts] If the following commands are executed:
```
Ask patches [
   Ifelse abs pxcor = abs pycor
   [  set pcolor white]
   [  set pcolor black]
]
```
Which of the following shapes will you see: (choose the best answer)

    A) one diagonal back line   **B) one diagonal white line**

    C) a single white patch   **D) a white "+"**   **E) a white "X"**

3. [3pts] If turtle F and turtle G use different turn methods as follows:
```
to TurnF
     rt random 3
     lt random 3
end
to TurnG
     rt (random 5) - 2
End
```

Which of the following is true?   (choose the best answer)

    A) Turtle F has a higher chance to remain at the same heading, compared to G.

    B) Turtle G has a higher chance to turn right, compared to F

    C) Turtles F and G will have the same possible outcomes, and probabilities.

    D) Turtle F has more possible resulting directions compared to Turtle G.

4. [6pts] Write code to create 100 turtles, placing those turtles on random locations such that no two turtles are on the same patch, and no turtle is on a red patch. (assume at least 100 patches are non-red, and there are no existing turtles).

5. [6pts] Write code (you needn't make it into a procedure) to ask the two turtles: turtle 4 and turtle 19, to swap their colors.

6. [4pts] Create the **My-Median** reporter that will be given a list of numbers which are already in increasing order, and that the list has an odd number of elements (like 3 numbers or 157 numbers in it). The reporter should calculate and give back the median of the list. Yes, Netlogo has a median function. No, you may not use it.

```
To-report My-Median [my-list]
      ; your excellent code
end
```

7. [6pts] Create a procedure called **Border** that will create a red border around the Netlogo world, a single patch wide. Do not assume that the world has 33 x 33 patches, but you may assume that the patch in the center of the world has coordinates (0,0).

8. [5pts] The named colors, (like red, green, blue, sky, magenta, etc.) in the Netlogo color palette have the values: 5, 15, 25, 35, 45, 55, 65, 75, 85, 95, 105, 115, 125, 135. Create a reporter called **RandomColor** that will report a random one of these colors with equal probability. You may not use either of the commands, *one-of* or *n-of*.

9. [8pts] Assume that we have two breeds: Zombies and Humans. The zombies and humans have a somewhat difficult time coexisting (except on Mr. K's t-shirts). Write the procedure called **FantasyOfK** that compares the number of zombies and humans on each patch, and decides what to do based on these actions:
-More zombies than humans on the patch makes the humans on the patch die.
-More humans than zombies on the patch makes the zombies on the patch die.
-The same number of zombies and humans on the patch:
      80% chance: All the zombies AND humans on the patch die
      20% chance: that they all survive.

10. [6pts] Create a **Go** (forever) procedure that does the following: if the mouse cursor is in the Netlogo world and the mouse button is down, it should be dragging turtle 0 around wherever it goes, except when the mouse is pointing at a red patch. Turtle 0 cannot be dragged onto a red patch.

11. [4 points Extra credit] Create a procedure called **PatchBorder** that will draw a border around every patch in the world (do not assume that it's necessarily a 33 x 33 world). The desired color of the border will be given as a parameter:

```
To PatchBorder [border-color]
      ; your superb code
End
```