## Practice Test 2

## Choose any 3 of the following problems :

1. Six integer numbers, $a_{1}, a_{2}, a_{3}, a_{4}, a_{5}$, and $a_{6}$ are chosen randomly. Prove that $\prod_{1 \leq i<j \leq 6}\left(a_{i}-a_{j}\right)$ is divisible by 10 .
2. Solve for $x:|x+1|+5-x^{2} \geq 0$
3. Let $F_{0}=0, F_{1}=1, F_{2}=1, \ldots, F_{99}$ be the first 100 Fibonacci numbers (recall that $F_{n}=F_{n-1}+F_{n-2}$ for $n \geq 2$ ). How many of them are even?
4. A circle is divided into six sectors. Then the numbers $1,0,1,0,1,0$ are written into the sectors as shown below. We may increase any two neighboring numbers by 1 . We may repeat this step as many times as we want. Is it possible to equalize all the numbers?

