**Faculty of Physics-Mathematics and Computer Sciences**

**Discrete Mathematics 2015-2016**

**Pre–test**

1. Suppose we have two large integers, say 180 and 320. Find their greatest common divisor?**(1 point)**
2. Suppose that  is defined recursively by  and that . Find .**(1 point)**
3. Suppose . How many subsets of set ? **(1 point)**
4. Let  be defined by  and let . Evaluate g(A). **(1 point)**
5. How many functions are there from {a,b,c,d} to {3,4,5}.**(1 point)**
6. Let  and  , find  and ? **(1 point)**
7. How many integers from 50 through 300 are multiples of 3 or multiples of 5? **(1 point)**
8. A password consists of 3 digits (each digit can be 0 through 9). How many such passwords have at least one digit repeated? **(1 point)**

**Post–test**

1. Suppose we have two large integers, say 3500 and 4500. Find their greatest common divisor?**(1 point)**
2. Suppose that  is defined recursively by  and that . Find .**(1 point)**
3. Use Venn diagrams to prove that A ∩ (B ∪ C)=(A ∩ B) ∪ (A ∩ C)? **(1 point)**
4. Let  be defined by  and let . Evaluate g(A). **(1 point)**
5. How many functions are there from {1,2,3,4,5} to {a,b,c}.**(1 point)**
6. Let f(x) = x + 2 and g(x) = 2x + 1, find  and ? **(1 point)**
7. How many integers from 400 through 1600 are multiples of 4 or multiples of 6? **(1 point)**
8. A password consists of 5 digits (each digit can be 0 through 9). How many such passwords have at least one digit repeated? **(1 point)**

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|  | **Pre - test** | | | | | | | |  | **Post - test** | | | | | | | | |
| N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |  | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
|  | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
|  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 0 | 1 |  | 0 | 0 |  | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
|  | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |  | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
|  | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |  | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |  | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
|  | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
|  | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |  | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
|  | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |  | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
|  | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |  | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
|  | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |  | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
|  | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |  | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
|  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |