Name and surname: **Date: October 24, 2019**

EXAM 4 (duration: 40 minutes)

DatZ1143: Discrete mathematics for computing
Instructor: Abuzer Yakaryılmaz
Autumn 2019

Questions

(There are 7 questions on 2 pages with total 10 points.)

It is given that $\sum_{j=1}^{n} j = \frac{n(n+1)}{2}$.

1) Calculate the summation $\sum_{i=1}^{40} 3i - 2$. Your final answer must be a single integer. (2 points)

2) Calculate the following **infinite** summation:

$$5^2 + 5^1 + 5^0 + \frac{1}{5^1} + \frac{1}{5^2} + \frac{1}{5^3} + \cdots + \frac{1}{5^n} + \cdots \ .$$

Your final answer must be either a single number or the summation of two numbers. (2 points)

3) What are the quotient and reminder when 85 is divided by 9?
(i.e., $85 = q \cdot 9 + r$, where $0 \leq r < 9$. Find q and r.) (1 point)

4) What are the quotient and reminder when -85 is divided by 9?
(i.e., $-85 = q \cdot 9 + r$, where $0 \leq r < 9$. Find q and r.) (1 point)

5) What are the values of $gcd(30, 105)$ and $lcm(30, 105)$? (2 points)

6) Split the numbers in $\{6, 10, 21, 35\}$ into two sets such that the numbers in each set are relatively prime. (1 point)

7) Which pairs in $\{-77, -53, -24, 24, 53, 77\}$ are congruent to each other modulo 7? (1 point)