**3 individual physics task:**

Edited at 1pm 26.11.2016.

s is your student number. k = n mod 10000. T = n mod 100.

1. Physics deals with circuits and logic, thus, join the world championship in physics and scores the best you can there: http://azspcs.net/

2. T kilowatts of electric power is sent to a town from a power plant. The transmission lines have the total resistance of 0.1T Ohms. Calculate the power loss if the power is transmitted at:

(a) 0.03k Volts

(b) s Volts

3. Calculate the series and the parallel circuits with e.m.f. of T Volts and the resistors L+1, 2 and 3 ohms respectively.

4. Find the frequency and the period of the harmonic oscillator for k μH and T μF.

5. A man 0.25k mm tall stands in front of a vertical plane mirror. His eyes are 10 cm bellow the top of his head. What are the sizes and the best location of the smallest possible mirror so that he can see his entire body?

6. For convex mirror with a radius of curvature of 0.002k meters, determine the location of the image and its magnification for an object 0.0012k meters from the mirror.

7. A spy satellite camera can recognize T cm objects from the altitude of n meters. If diffraction was the only limitation (the wave length Lambda = 0.1k nanometers), determine what diameter lens the camera has.

8. Suppose a star has a surface temperature of 4k degrees. What color would this star appear?

9. Calculate the energy of a photon for Lambda = 0.05k nanometers.

10. Prepare to Dota2 Gaming Competition. Try to win millions US$.

http://www.dota2.com/international/overview

https://en.wikipedia.org/wiki/The\_International\_(Dota\_2)

11. Develop your project into a research paper.

Your digital signature:

Calculate your secret random number between 1 and k as your digital signature.

d =RANDBETWEEN(1, k)

https://www.random.org/integers/

Do NOT share your d with anybody, including me.

My mode is 421, give your 3d mod 997 = . . . . . . . . . here d is your secret digital signature.

421d mod 997 = secret key.

http://www.dcode.fr/modular-exponentiation-calculus

Create new email account with password DiGsIg777, here instead of 777 must be the secret key.

Write the secret key only in the password to the new email, do not share the secret key we anybody, including me.

**Deadline: 30.11.2016.**