Physics – Foundation Programme

Topics and conditions for the test #1 – part mathematics & SI units.

Date: the 11th November, 2024

Topics worth to review (+ reference to lecture number L#)

- Algebraic expressions
  - simplification of AE (L2)
  - order of operations (L1)
  - expressions with integer exponents (L2) – operations, simplification
  - prime factorization, the greatest common factor (GCF) and the least common multiple (LCM) (L1 and L2)
- Solving equations (L3)
  - linear equations
  - system of linear equations
  - quadratic equations
- Logarithms and exponential functions (L4)
  - transformation between the exponential and the logarithmic form
  - evaluation of logarithms using the change-of-base formula
- Scientific notation (L1 and L2)
  - transformation between standard notation and scientific notation
- Significant digits and rounding (L1)
- Calculations with percents (L1)
- Trigonometric functions (L5)
  - Finding values of trigonometric functions for a right triangle
  - Determination of the amplitude and the period a trigonometric function
- Vectors (L6)
  - Adding vectors by use of the Law of Cosines

- - Determining components of vectors
    - Resolving vectors
- System of units SI (L7)
    - SI base units
    - Expressing derived units using base units
    - Prefixes for SI units
- Some assignments will be formulated via verbal form rather than via mathematical expressions. Please, look at assignments involving
    - work efficiency and mixing of solutions (L3);
    - radioactive decay – half lifetime (L4)
    - angle of elevation and depression (L5)
    - distance from a starting point after an object/live being consecutively moves in two different directions (the prospector in forest case, a crawling ant, etc.) (L6)
    - Resolving force vector for an object on a ramp (L6)

Conditions

- 10 test questions with answer range "a – e" each (i.e. you choose one out of 5 options for each question, only one answer being correct)
- Non-graphic calculators are allowed and strongly encouraged to be used during the test.
- Usage of any other electronic devices than a calculator is forbidden during the test.