5 individual task in physics:

Edited at 4pm 16.1.2018.

s is your student number. k = s mod 10000. T = s mod 100. m = s mod 35. a = s mod 25.

L = s mod 10. $d\_{2}=\frac{T-L}{10}$. e = s mod 8. m7 = s mod 7. m6 = s mod 6. m5 = s mod 5. m4 = s mod 4. m3 = s mod 3.

m2 = s mod 2.

L = 0: 1. What color must be a refrigerator?

L = 1: 2. What clothe is warmer, black or white?

L = 2: 2.2. Why does the cat sit like this?



L = 3: 2.3. Is it Schrodinger’s cat?

L = 4: 2.4. What colors and surface areas are people and animals in hot and cold countries?

L = 5: 3. What color is the Sun?

3.2. Suppose a star has a surface temperature of 4k degrees. What are the wavelength and the color this star appears?

http://physics16.weebly.com/uploads/5/9/8/5/59854633/color4black4body.txt

3.3.

m4 = 0: What visible light is the fastest? Why?

m4 = 1: What visible light is the most noticeable? Why?

m4 = 2: What visible light has the most energy? Why?

m4 = 3: What visible light is the most absorbed? Why?

L = 6: 4. What is quantum money?

L = 7: 4.2. Are massless or mass-full particles used in quantum information? Why?

5. Find V1 for the transformer if V2 = T volts, N1 = k and N2 = s.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/transformer.txt

5.2. 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

http://physics16.weebly.com/uploads/5/9/8/5/59854633/losses4transmitting4power.txt

5.3. A circular coil of wire has a diameter of 0.002k cm and contains 10 loops. The current in each loop is 3A, and the coil is placed into 2TESLA external magnetic field. Determine the maximum and minimum torque exerted on the coil by the field.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/torque.txt

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

http://physics18.weebly.com/uploads/5/9/8/5/59854633/series\_parallel\_circuits.txt

6. Find the electrical current i in the circuit for R = T, L = 1/k, C = 1/s, ω = k, and εm = T.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/2054\_ch21a.pdf

6.2. 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?

http://physics16.weebly.com/uploads/5/9/8/5/59854633/height4mirror.txt

6.3. 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.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/mirror.txt

6.4. 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.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/satellite4spying.txt

7. Find the frequency and the period of the harmonic oscillator. L = k μH and C = T μF.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/rlc4circuit4natural4frequency4period.txt

8. Find energy and momentum of photon of s Hz frequency.

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

http://physics16.weebly.com/uploads/5/9/8/5/59854633/energy4photon.txt

9.2. Determine the wavelength of an electron that has been accelerated through the potential difference of T Volts.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/wavelength4electron.txt

10. Calculate the wavelength of k grams desk moving T centimeters per second.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/waves4matter.txt

11. What is the matter wave length of T gram book?

12. Find the energy level and angular momentum for hydrogen according to the Bohr Model.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/bohr.txt

13. Find the annihilation energy of k grams of matter.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/energy4binding.txt

L = 8: 14. What is Doppler Effect?

https://en.wikipedia.org/wiki/Doppler\_effect

L = 9: 15. How does radar work?

https://en.wikipedia.org/wiki/Radar

L = 0: 16. Explain implosion.

https://en.wikipedia.org/wiki/Nuclear\_weapon\_design

L = 1: 17. What is the Fat Man?

https://en.wikipedia.org/wiki/Fat\_Man

L = 2: 18. Explain the tunneling effect.

https://en.wikipedia.org/wiki/Quantum\_tunnelling

L = 3: 19. What is photon polarization?

https://en.wikipedia.org/wiki/Photon\_polarization

L = 4: 20. How is photon polarization used in quantum computing and quantum cryptography?

https://en.wikipedia.org/wiki/Quantum\_computing

https://en.wikipedia.org/wiki/Quantum\_cryptography

L = 5: 21. Explain quantum teleportation.

L = 6: 22. Explain the Big Bang.

https://en.wikipedia.org/wiki/Big\_Bang

L = 7: 23. What is the Standard Model of Physics?

https://en.wikipedia.org/wiki/Standard\_Model

24. If your velocity would be $v=\left(1-\frac{1}{e+2}\right)c$ then how would your height, mass, and time change?

L = 8: 25. Explain the Theory of Everything.

https://en.wikipedia.org/wiki/Theory\_of\_everything

L = 9: 31. Give the structure of neutron and proton.

L = 0: 33. Use the quantum computer.

https://www.research.ibm.com/ibm-q/

33.5. Calculate the remaining mass (it is NOT 0) of the decaying substance after k seconds if the decay ratio is T and initial mass is s. Calculate the half-life.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/code4nuclear4decay4half4life.txt

33.6. Perform correlation and regression analyses of the periodic table for T+2 elements and for m7 + 3 elementary particles.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/correlations4periodic4table.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/regression4periodic4table.txt

http://physics16.weebly.com/uploads/5/9/8/5/59854633/evergy4lifetime.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/regression4elementary4particles4energies4life4times.txt

m3 = 0: 33.7. What particles mediate electromagnetic interaction?

A. electrons

B. protons

C. positrons

D. photons

m3 = 1: 33.8. What particles mediate strong interaction?

A. neutrons

B. gluons

C. photons

D. protons

m3 = 2: 33.9. How many times is Electromagnetic Force weaker than the Strong Force?

A. 137

B. 758

C. 3592

D. 126434

33.10. Thermodynamics:

m4 = 0: Write Ideal Gas equation.

m4 = 1: Give isothermal process equation.

m4 = 2: Give isobaric process equation.

m4 = 3: Give isochoric process equation.

33.11. Optics:

m5 = 0: Explain plane mirror.

m5 = 1: Explain convex mirror.

m5 = 2: Explain concave mirror.

m5 = 3: Explain converging lens.

m5 = 4: Explain diverging lens.

33.12. Maxwell equations:

m2 = 0: Explain Maxwell equations.

m2 = 1: Give the solution to the simplified Maxwell equations.

L = 1: 33.17. What is Nuclear magnetic resonance quantum computer?

https://en.wikipedia.org/wiki/Nuclear\_magnetic\_resonance\_quantum\_computer

L = 2: 33.18. Explain cosmology.

https://en.wikipedia.org/wiki/Cosmology

L = 3: 33.22. Explain extraterrestrial life.

https://en.wikipedia.org/wiki/Extraterrestrial\_life

33.33. Thermodynamics:

m4 = 0: Explain Heat Engine.

m4 = 1: What is thermodynamics of air-conditioning?

m4 = 2: Give thermodynamics laws.

m4 = 3: Explain real gas.

L = 4: 33.34. What is Compton Effect?

https://en.wikipedia.org/wiki/Compton\_scattering

L = 5: 33.35. Explain Hole Effect.

https://en.wikipedia.org/wiki/Hall\_effect

L = 6: 33.36. Explain inertial reference frame.

L = 7: 33.37. What is General relativity?

L = 8: 33.38. Explain the Dark Matter.

L = 9: 33.39. What is Dark Energy?

L = 0: 33.40. Explain Critical Density of the Universe.

L = 1: 33.41. Give the equation for the critical density of the Universe.

L = 2: 33.42. Is the density of our Universe smaller, the same or larger than the critical density?

L = 3: 33.43. Explain the fundamental physical constants.

L = 4: 33.45. Explain Bose-Einstein Condensate.

L = 5: 33.46. What happens if the temperature = 0K?

L = 6: 33.47. Explain the physical vacuum.

L = 7: 33.49. Is North Korea capable of creating a hydrogen bomb?

L = 8: 33.49. What is the probability of the nuclear war and how to prepare to that?

L = 9: 33.50: Explain Heisenberg Uncertainty Principle.

33.51. Find the energy of the photon with the frequency of s Hz.

E2 = (mc2)2 + (pc)2.

L = 0: 33.52. Give the structure of neutron.

L = 1: 33.53. Give the structure of proton.

L = 2: 33.54. How can we travel faster than the speed of light?

L = 3: 33.55. Explain the Universe expanding faster than the speed of light.

L = 4: 33.56. What is tachyon?

https://en.wikipedia.org/wiki/Tachyon

L = 5: 33.57. Explain quantum computing and quantum communication.

L = 6: 33.58. What is a lepton?

L = 7: 33.59. Define a hadron.

L = 8: 33.60. What is the mass of neutrino?

L = 9: 33.61. Why do the particles making mesons do not annihilate?

34. Improve your project.

Deadline: January 2018.