**PHYS 232 Assignment # 7 due Wednesday April 22*,* 2020 at 10 am**

1. Submit your solutions of the following 2 problems on Ritaj by **Wednesday April 22*,* 2020 at 10 am**
2. Submit maximum 2 pages (one page per problem)
3. Label the files by your name + problem number:

For example: SamirSalim1.jpg …etc….

1. Use the method of iteration to estimate the energy of the first excited state of an electron moving in a potential well of width L = (0.1+ 0.02N) nm and height U0 = (200 + 6N) eV where N is the last digit in your student number. For example if your student number is 1181405 then N=5 and

$L=\left(0.1+0.02×5\right) nm =0.2 nm$ , $U\_{0}=\left(200+6×5\right) eV =230 eV$

You must do at least 4 iterations. If the result (to 3 significant figures) does not converge fast you may need to do more than 4 iterations. Start the first iteration by assuming $δ=0$ and give the first 5 digits of all calculated values. Give your final answer to 3 significant figures.

Submit your **typed** solution in the form of a table as follows (no need to show the detailed calculations):

|  |  |
| --- | --- |
| Student name |  |
| Student number |  |
| L (in nm) |  |
| U0 (in eV) |  |
|  | $δ $(in nm) | E2 (in eV) |
| First iteration | 0.0000 |  |
| Second iteration |  |  |
| Third iteration |  |  |
| Fourth iteration |  |  |
| Fifth iteration |  |  |
| Sixth iteration |  |  |
|  |  |  |
| Answer | E2 =  |

 (45%)

1. Show that

ψ(x) = (A x2 + B) exp [ - mωx2/(2ħ) ]

is a solution of the Schroedinger equation for the Harmonic Oscillator. What is the corresponding energy? What is the relation between A and B?

(45%)

**+10%** for good hand-writing and clear and well-organized solutions.

**You are expected to work alone. Academic honesty is very important. Cheating will make you lose grades.**