University of Tehran

Department of Electrical and Computer Engineering

Modern Physics – Dr. Mohammad Abdolahad

Spring 2023

Assignment 2: Numerical Solution of the Schrodinger Equation

Due Date: 2023.06.14

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1. Using the method you proposed in assignment 1, numerically solve the Schrödinger equation for a harmonic oscillator with arbitrary specifications. Plot the obtained wave function for the first, twenty-fifth, and hundredth energy levels in a single figure. Also, plot the energy diagram as a function of the wave number for the first 100 energy levels, both numerically and analytically, and compare the results. Analyze the outcome. Compare the behavior of the electron's wave function at higher and lower energy levels.

Please upload the explanations and the required outputs in a PDF file, along with the code used in MATLAB in txt format, compressed in a file, to the system.