Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) For a 1D quantum mechanical simple harmonic oscillator the potential is:
   - symmetric
   - anti-symmetric
   - has inversion symmetry

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   symmetric
   has inversion symmetry

2) In the bracketing/bisection method that is used to determine the eigenvalues, with every iteration, the difference between the maxima ($E_{\text{max}}$) and minsima ($E_{\text{min}}$) of energy
   - increases
   - decreases
   - remains same

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   decreases

3) Which of the following properties should a wavefunction satisfy?
   - The wavefunction and its first derivative should be continuous
   - The wavefunction should have discontinuity
   - Only the first derivative of the wave function should be continuous
   - None of the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   The wavefunction and its first derivative should be continuous

Using the Numerov algorithm solve the one dimensional problem for a potential given by $V = bx^4 + cx^2$, where $b = 1$ and $c = 6$ and answer the following questions:

4) How many minima does the above potential have?
   - Zero
   - One
   - Two
   - Three

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Two

5) The ground state energy, correct up to two places after decimal is given by

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   -6.64
   -6.75
   6.64
   6.75

6) Which of the following statements are true about the probability density of a particle in its ground state in the above mentioned potential:
   - A minima at $x = 0$
   - Is symmetric
   - Is same for all values of $x$ and is zero
   - Is same for all values of $x$ and has a non-zero value

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   A minima at $x = 0$
   Is symmetric