

HOUSE No. 1490

By Mrs. Hicks of Wayland, petition of Lucile P. Hicks, Carol C. Amick, Argeo P. Cellucci and Robert A. Durand for legislation to prohibit the Metropolitan District Commission from constructing a water treatment plant at the Sudbury River without considering the findings of its long range water supply study. Housing and Urban Development.

The Commonwealth of Massachusetts

In the Year One Thousand Nine Hundred and Eighty-Six.

AN ACT PROHIBITING THE METROPOLITAN DISTRICT COMMISSION FROM CONSTRUCTING A WATER TREATMENT PLANT AT THE SUDBURY RIVER WITHOUT CONSIDERING THE FINDINGS OF ITS LONG RANGE WATER SUPPLY STUDY.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

- 1 The metropolitan district commission shall not construct a
- 2 water treatment plant at the Sudbury reservoir, nor shall said
- 3 commission cause the diversion of any water from the Sudbury
- 4 river into waters under the control of the commission without first
- 5 considering the final findings of the commission's long range water
- 6 supply study environmental impact report.

PHYSICS 551 - QUANTUM MECHANICS

PROBLEM SET 10

1. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the probability of finding the particle in the region $0 < x < \frac{a}{4}$.

2. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the expectation value of the momentum $\langle p \rangle$.

3. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the expectation value of the energy $\langle E \rangle$.

4. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the probability of finding the particle in the region $\frac{a}{4} < x < \frac{3a}{4}$.

5. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the expectation value of the position $\langle x \rangle$.

6. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the expectation value of the momentum squared $\langle p^2 \rangle$.

7. A particle of mass m is confined to a one-dimensional infinite potential well of width a . The wave function is given by $\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{n\pi x}{a}\right)$ for $0 < x < a$ and zero elsewhere. Calculate the expectation value of the energy squared $\langle E^2 \rangle$.