

5 ① $H = \frac{p^2}{2mR^2} - e\mathcal{E}R \cos(\theta)$

5 ② סיבובים, סיבובים
הכרה שלגית סיבובים

10 ③ $H = \left(\begin{array}{c|c} \{E_n\} & \\ \hline & \{E_n\} \end{array} \right) + \left(\begin{array}{c|c} V_{nm}^{even} & \\ \hline & V_{nm}^{odd} \end{array} \right)$

$$E_n = \frac{1}{2mR^2} n^2$$

$$V^{even} = -\frac{1}{2} e\mathcal{E}R \begin{pmatrix} \frac{0}{\sqrt{2}} & \frac{\sqrt{2}}{2} & & \\ & 0 & 1 & \\ & 1 & 0 & 1 \\ & & & 1 & 0 & \dots \end{pmatrix}$$

$$V^{odd} = -\frac{1}{2} e\mathcal{E}R \begin{pmatrix} 0 & \frac{1}{2} & & \\ 1 & 0 & \frac{1}{2} & \\ & \frac{1}{2} & 0 & \frac{1}{2} \\ & & \frac{1}{2} & 0 & \dots \end{pmatrix}$$

10 ④ $E_0 = 0 + \frac{(e\mathcal{E}R/\sqrt{2})^2}{0 - (\frac{1}{2mR^2})} + \dots$

10 ⑤ $E_{(n>1)}^{[2]} = \frac{(e\mathcal{E}R/2)^2}{(\frac{1}{2mR^2})} \left(\frac{1}{n^2 - (n+1)^2} + \frac{1}{n^2 - (n-1)^2} \right)$

⚡

$$\frac{2}{4n^2 - 1}$$