

⑤

$$\frac{\delta}{\delta \xi(t)} \int dt' V(\xi(t'))$$

$$= \int dt' \frac{\delta V(\xi(t'))}{\delta \xi(t)} + \int dt' V(\xi(t')) \frac{\delta}{\delta \xi(t)}$$

$$\left[\begin{aligned} & \frac{\delta V(\xi(t'))}{\delta \xi(t)} \\ &= \lim_{\varepsilon \rightarrow 0} \frac{V(\xi(t') + \varepsilon \delta(t'-t)) - V(\xi(t'))}{\varepsilon} \\ &= \frac{dV(\xi(t'))}{d\xi(t')} \delta(t'-t) \end{aligned} \right]$$

$$\downarrow \\ = \frac{dV(\xi(t))}{d\xi(t)} + \int dt' V(\xi(t')) \frac{\delta}{\delta \xi(t)}$$

$$= \frac{\alpha}{i\hbar} \int D\xi \overline{\Phi[\xi]} \frac{dV(\xi(t))}{d\xi(t)} \Phi[\xi]$$

$$\therefore \frac{d^2}{dt^2} \int Dx \overline{\Phi[x]} x(t) \Phi[x]$$

$$= \frac{-i\hbar}{m\alpha} \cdot \frac{\alpha}{i\hbar} \int D\xi \overline{\Phi[\xi]} \frac{dV(\xi(t))}{d\xi(t)} \Phi[\xi]$$