$$J(x_0, 0) = \min_{\substack{u_j \in U_j \\ j=0,1\ldots N-1}} \left[\sum_{j=0}^{N-1} \{L(x_j, u_j, j)\} + G(x_N, N) \right]$$

$$s.t. \tag{1}$$

$$x_{j+1} = f(x_j, u_j, j) + \sigma_{j+1}\xi_{j+1}$$

$$j = 0, 1, \ldots N-1$$

$$J(x_N, N) = G(x_N, N) \tag{2}$$

$$J(x_k, k) = \min_{u_k \in U_k} \mathcal{E}J(x_{k+1}, k+1) + L(x_k, u_k, k) \tag{3}$$