$\mathcal{E}_1$

Función Hamiltoniana o Hamiltoniano

Obs.
$$x_i \equiv x_i(\{q\},t)$$
$$\Downarrow$$
$$\dot{x}_i \equiv \dot{x}_i(\{q\},\{\dot{q}\},t)$$
$$\Downarrow$$
$$L \equiv L(\{\dot{x}\},\{x\},t) \Longrightarrow L \equiv L(\{\dot{q}\},\{q\},t)$$

DEF
$$H = \sum_{j=1}^{s} \Pi_{q_j}\dot{q}_j - L \qquad \text{(Hamiltoniano)}$$

Obs.
$$\frac{dH}{dt} = \dot{H} = \sum_{j=1}^{s} \dot{\Pi}_{q_j}\dot{q}_j + \sum_{j=1}^{s} \Pi_{q_j}\ddot{q}_j - \frac{dL}{dt}$$

con
$$\frac{dL}{dt} = \sum_{j=1}^{s} \underbrace{\frac{\partial L}{\partial q_j}}_{\dot{\Pi}_{q_j}} \dot{q}_j + \sum_{j=1}^{s} \underbrace{\frac{\partial L}{\partial \dot{q}_j}}_{\Pi_{q_j}} \ddot{q}_j + \frac{\partial L}{\partial t}$$

$\dot{\Pi}_{q_j}$ ← de la ec. de movimiento

Π_{q_j} ← por def.

$\therefore \quad \frac{dH}{dt} = -\frac{\partial L}{\partial t}$

si L no depende explícitamente de t

$\Downarrow$

$H = \text{cte.}$ de movimiento.

<u>Obs.</u> ligaduras escleronomos.

independientes de t

$\Downarrow$

$$f(\{x\}) = 0$$

si ligaduras son escleronomos

$\Downarrow$

$$H = E = T + V$$