

PART A : THEORY

1. List - Formation Rule :

$$\frac{\tau \text{ is a type}}{\text{LIST}(\tau) \text{ is a type}} \quad (\text{LIST FORMATION})$$

Category: Formation Rule

2. List - Cons Rule :

$$\frac{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e_1 : \tau \quad \Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e_2 : \text{LIST}(\tau)}{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash \text{LIST-CONS}(e_1, e_2) : \text{LIST}(\tau)} \quad (\text{LIST-CONS})$$

Category: Introduction Rule

3. List - Empty Rule :

$$\frac{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e : \tau}{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash \text{LIST-EMPTY}(e) : \text{LIST}(\tau)} \quad (\text{LIST-EMPTY})$$

Category: Introduction Rule

4. List - Null Rule

$$\frac{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e : \text{LIST}(\tau)}{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash \text{LIST-NULL}(e) : \text{BOOL}} \quad (\text{LIST-NULL?})$$

Category: Elimination Rule

5. List-Car Rule :

$$\frac{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e : \text{LIST}(\tau)}{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash \text{LIST-CAR}(e) : \tau} \quad (\text{LIST-CAR})$$

Category : Elimination Rule

6. List - Cdr Rule :

$$\frac{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash e : \text{LIST}(\tau)}{\Gamma_{\xi}, \Gamma_{\phi}, \Gamma_{\rho} \vdash \text{LIST-CDR}(e) : \text{LIST}(\tau)} \quad (\text{LIST-CDR})$$

Category : Elimination Rule