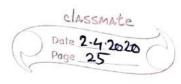THEOREM : DESTINY

$\forall e$ EXP

① $e$ simplifies to a normal form

② the normal form is unique

③ the normal form is one of
   VAL, DIV/0, ATM

④ if the category of normal form is $\alpha$,
   where
   $\alpha \in \{$ VAL, DIV/0, ATM $\}$

   then for every intermediate expression

   $e_i$ in $e = e_0 \rightarrow e_1 \rightarrow \ldots e_n,$

   $e_i \in \alpha^*$

PROOF

① is due to strong termination of →

② is due to ① and confluence of →

③ is due to partitioning theorem of normal forms of →

④ is due to the preservation lemma for VAL*, DIV/0*, ATM*