翻译文法设计为：

E → TE’ ①

E’ → +T{GEQ(+)}E’ ② | -T{GEQ(-)}E’ ③ | ε ④

T → FT’ ⑤

T’ → \*F{GEQ(\*)}T’ ⑥ | /F{GEQ(/)}T’ ⑦ | ε ⑧

F → i {PUSH(i)} ⑨ | (E) ⑩

LL(1)分析表为：

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | i | + | - | \* | / | ( | ) | # |
| E | ① |  |  |  |  | ① |  |  |
| E’ |  | ② | ③ |  |  |  | ④ | ④ |
| T | ⑤ |  |  |  |  | ⑤ |  |  |
| T’ |  | ⑧ | ⑧ | ⑥ | ⑦ |  | ⑧ | ⑧ |
| F | ⑨ |  |  |  |  | ⑩ |  |  |

待翻译的表达式为：a\*(a+b)/c\*(c-d)#

则分析表为：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SYN | x | w | 操作 | SEM | QT |
| #E | E | a | PUSH① |  |  |
| #E’T | T | a | PUSH⑤ |  |  |
| #E’T’F’ | F | a | PUSH⑨ |  |  |
| #E’T’Pa | a | a | NEXT(w) |  |  |
| #E’T’P |  | \* |  | a |  |
| #E’T’ | T’ | \* | PUSH⑥ | a |  |
| #E’T’MF\* | \* | \* | NEXT(w) | a |  |
| #E’T’MF | F | ( | PUSH⑩ | a |  |
| #E’T’M)E( | ( | ( | NEXT(w) | a |  |
| #E’T’M)E | E | a | PUSH① |  |  |
| #E’T’M)E’T | T | a | PUSH⑤ |  |  |
| #E’T’M)E’T’F’ | F | a | PUSH⑨ |  |  |
| #E’T’M)E’T’Pa | a | a | NEXT(w) |  |  |
| #E’T’M)E’T’P |  | + |  | aa |  |
| #E’T’M)E’T’ | T’ | + | PUSH⑧ | aa |  |
| #E’T’M)E’ | E’ | + | PUSH② | aa |  |
| #E’T’M)E’AT+ | + | + | NEXT(w) | aa |  |
| #E’T’M)E’AT | T | b | PUSH⑤ | aa |  |
| #E’T’M)E’AT‘F | F | b | PUSH⑨ | aa |  |
| #E’T’M)E’AT‘Pb | b | b | NEXT(w) | aa |  |
| #E’T’M)E’AT‘P |  | ) |  | aab |  |
| #E’T’M)E’AT‘ | T‘ | ) | PUSH⑧ | aab |  |
| #E’T’M)E’A |  | ) |  | a | (+ , a , b , t1) |
| #E’T’M)E’ | E’ | ) | PUSH④ | at1 |  |
| #E’T’M) | ) | ) | NEXT(w) | at1 |  |
| #E’T’M |  | / |  |  | (\* , a , t1 , t2) |
| #E’T’ | T’ | / | PUSH⑦ | t2 |  |
| #E’T’DF/ | / | / | NEXT(w) | t2 |  |
| #E’T’DF | F | c | PUSH⑨ | t2 |  |
| #E’T’DPc | c | c | NEXT(w) | t2 |  |
| #E’T’DP |  | \* |  | t2c |  |
| #E’T’D |  | \* |  |  | (/ , c , t2 , t3) |
| #E’T’ | T’ | \* | PUSH⑥ | t3 |  |
| #E’T‘MF\* | \* | \* | NEXT(w) | t3 |  |
| #E’T’MF | F | ( | PUSH⑩ | t3 |  |
| #E’T’M)E( | ( | ( | NEXT(w) | t3 |  |
| #E’T’M)E | E | c | PUSH① | t3 |  |
| #E’T’M)E’T | T | c | PUSH⑤ | t3 |  |
| #E’T’M)E’T’F | F | c | PUSH⑨ | t3 |  |
| #E’T’M)E’T’Pc | c | c | NEXT(w) | t3 |  |
| #E’T’M)E’T’P |  | - |  | t3c |  |
| #E’T’M)E’T’ | T’ | - | PUSH⑧ | t3c |  |
| #E’T’M)E’ | E’ | - | PUSH③ | t3c |  |
| #E’T’M)E’ST- | - | - | NEXT(w) | t3c |  |
| #E’T’M)E’ST | T | d | PUSH⑤ | t3c |  |
| #E’T’M)E’ST’F | F | d | PUSH⑨ | t3c |  |
| #E’T’M)E’ST’Pd | d | d | NEXT(w) | t3c |  |
| #E’T’M)E’ST’P |  | ) |  | t3cd |  |
| #E’T’M)E’ST’ | T’ | ) | PUSH⑧ |  |  |
| #E’T’M)E’S |  | ) |  | t3 | (- , c , d , t4) |
| #E’T’M)E’ | E’ | ) | PUSH④ | t3t4 |  |
| #E’T’M | ) | ) | NEXT(w) |  | (- , t3 , t4 , t5) |
| #E’T’ |  | # |  | t5 |  |
| #E’T’ | T’ | # | PUSH⑧ | t5 |  |
| #E’ | E’ | # | PUSH④ | t5 |  |
| # | # | # | OK | t5 |  |

综上，上述表达式的四元式表示为：

(+ , a , b , t1)

(\* , a , t1 , t2)

(/ , c , t2 , t3)

(- , c , d , t4)

(- , t3 , t4 , t5)

运行结果截图为：

