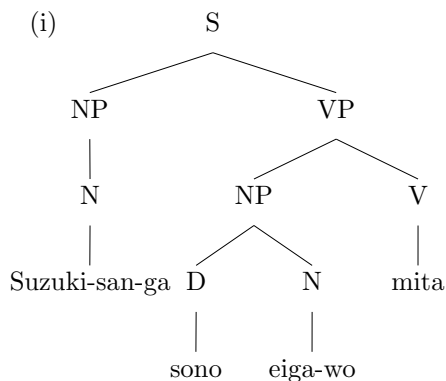**Chapter 2, Problem 4: CFG for Japanese**

A. As noted in the problem, many different CFGs are consistent with the data given, and some will scale up better than others. Any CFG that works is given full credit. We will give a CFG here that is similar to the CFG for English given in the text, in order to highlight the main differences illustrated in this problem: In Japanese, verbs come at the end of the sentence, and it has POSTPOSITIONS (like *e* 'to') which follow their objects rather than prepositions (cf. English *to*). Since no evidence is given in the problem for a NOM constituent, we won't posit one. We will assume that the object of a postposition is an NP (rather than a N), although nothing in the sentences given requires this.

$S \rightarrow NP \ VP$

$NP \rightarrow (D) \ (A) \ N$

$VP \rightarrow (NP) \ V$

$VP \rightarrow PP \ VP$

$PP \rightarrow NP \ P$

B. (i)

```
                        S
            ┌───────────┴───────────┐
           NP                       VP
            │               ┌────────┴────────┐
            N              NP                  V
            │          ┌────┴────┐             │
     Suzuki-san-ga     D         N            mita
                       │         │
                     sono     eiga-wo
```

(ii)

```
                        S
            ┌───────────┴───────────┐
           NP                       VP
            │               ┌────────┴────────┐
            N              NP                  V
            │          ┌────┼────┐             │
     Suzuki-san-ga     D    A    N            mita
                       │    │    │
                     sono omoshiroi eiga-wo
```

(i)

```
                      S
           ┌──────────┴──────────┐
          NP                     VP
           │             ┌───────┴───────┐
           N            PP               VP
           │         ┌───┴───┐            │
    Suzuki-san-ga   NP       P            V
                     │        │           │
                     N        e          itta
                     │
                  Toukyou
```