1. S → AaAb

   S → Bb

   A → ε
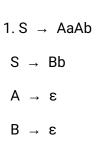
   B → ε

(a) Compute the FIRST sets for A, B, and S.

(b) Compute the FOLLOW sets for A, B and S.

(c) Is the CFG G LL(1)? Justif

2. Given the CFG G = {S, {S, U,V, W}, {a, b,c,d}, P } with P given as shown below:

   S → UVW

   U → (S) | aSb | d

   V → aV | ε

   V → cW | ε

a) Construct its a table-based LL(1) predictive parser;

b) Give the parsing actions for the input string "(dc)ac".

3. Given the Syntax-Directed Definition below construct the annotated parse tree for the input expression: "int a, b, c".

   D → T L

   T → int

   T → float

   L → L1, id

4. Construct a Syntax-Directed Translation scheme that takes strings of as, bs and cs as input and produces as output the number of substrings in the input string that correspond to the pattern a(a|b)*c+(a|b)*b. (For example the translation of the input string "abbcabcababc" is "3".

   Abbcabcababc---1

   Abbcabcababc---2

   Abbcabcababc---3)