For questions 1-4, symbolize the English sentence using the abbreviation scheme provided. (4 marks each)

1. Jane, who is either tired or sick, will stay home if and only if Lu, who is tired and sick, will not stay home.

   P: Jane will stay home. Q: Lu will stay home. R: Jane is tired. S: Jane is sick.
   T: Lu is tired. Z: Lu is sick.

   $(R \vee S) \wedge (T \wedge Z) \wedge (P \leftrightarrow \sim Q)$

   Can be put in official, or more parentheses around the conjunctions

   Conjuncts can be in any order

2. John going to the party is necessary for Sally to go to the party, provided that Sally not going to the party is sufficient for at most two of Lu, Sanjay, and Pia to go to the party.

   P: John goes to the party. Q: Sally goes to the party. R: Lu goes to the party. S: