2. **COL703: Major-Q2 09:50-10:10, late submission accepted till 10:15, 5+(1+4) = 10 marks**

   Let Σ be a non-empty signature containing two or more function sysmbols.

   (a) Prove that two terms s and t are unifiable iff for every position $p \in pos(s) \cap pos(t)$, $rootsym(s|_p) \neq rootsym(t|_p)$ implies at least one of the symbols $rootsym(s|_p)$ or $rootsym(t|_p)$ is a variable.

   (b) Let $S = \{s_1, \cdots, s_n\}$ be a set of terms with $n > 2$. Then

      i. S is unifiable iff _____.
      Complete this sentence.

      ii. Prove your statement of the above part.