b) We run M-H sampler u (eg) time and collect
M samples $\{c[m], ..., \{c[m]\}\}$ for $m=1,...,M$ after mixing

$P(c_i | v_1,...,v_n) = P(c_i = k | v_1,...,v_n)$ for $k=1,...,K$

Let $g(c_i) = 1[c_i = n]$

$\hat{g}(\{c[1],...,\{c[M]\}) = \frac{1}{M} \sum_{m=1}^{M} g(\{c[m]\})$

c) For Gibbs sampling to work, it must be the that

$A(c'|c) = 1 = \min(1,1)$

$= \dfrac{P(v_i|c_{-j}) \cdot P(v_i|c_{=i})}{P(v_i|c_{=i}) \cdot P(v_i|c_{-j})}$

This will not work, because these is no
guarantee this quantity $= 1$