

# Counting Problems

1) "unusual"

a) # of unique subsets is  $2^5 = 32$

$\{ "U", "N", "S", "A", "L" \} \rightarrow$  So each can be either 1 or 0.

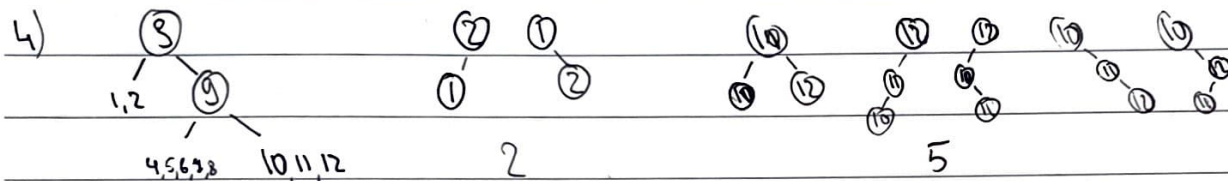
b) # of different strings is  $5P_5 = 120$

Because of repeating "u"s, they count for one. (Question asks for different strings)

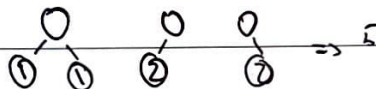
2)  $({}_{12}C_2 \cdot ({}_4C_2)^2) \cdot ({}_4C_1 \cdot {}_4C_1) = 123,552$  ways

3) 16 songs to play for 7 couples but 1 couple will only listen to 1 song.

${}_{16}C_1 \cdot {}_{15}C_6 = 16 \cdot 5005 = 80,080$



$\begin{matrix} 0 & 0 & 0 \\ \swarrow \searrow & \swarrow \searrow & \swarrow \searrow \\ 2 & 2 & 9 & 1 & 1 & 3 \\ (2,2) & 5 & 5 \end{matrix} = 14$



Total possibilities =  $(14)(5)(2) = 140$

5)

${}_{10}P_4 = 5040$

all 4 work

Total # combinations =  $5040 + 720 = 5760$

${}_{10}P_3 = 720$

one on break