HW 2 Osama Refaat (SE)

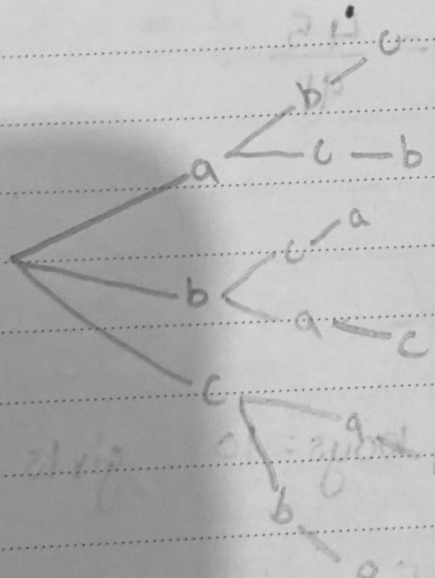
1) First test $12C_4 = \frac{12!}{4!8!} = 495$

second test $8C_4 = 70$

third = 1

So there are $1 \times 70 \times 495$ (34650) ways.

2)



3) 12 items total $P(D) = \frac{4}{12}$

i) $P(A) = \frac{4}{12} \times \frac{3}{11} = \frac{1}{11}$

$P(B) = \frac{8}{12} \times \frac{7}{11} = \frac{14}{33}$

ii) $\left(\frac{8}{12} \times \frac{4}{11}\right) + \left(\frac{4}{12} \times \frac{8}{11}\right) + \frac{4}{12} \times P(A)$

$= \frac{19}{33}$

4) 15 items Defective = 5

i) $\frac{10}{15} \times \frac{9}{14} \times \frac{8}{13} = \frac{24}{91}$

ii) $\left(\frac{10}{15} \times \frac{9}{14} \times \frac{5}{13}\right) \times 3 = \frac{45}{91}$

iii) $1 - \frac{24}{91} = \frac{67}{91}$

5) total students = 30 boys = 10 girls = 20

boys from mansoura = 5 girls from mansoura = 10

	boys	girls	
from mans	5	10	
not	5	10	
total	10	20	= 30

Answer $= \frac{10}{30} + \frac{15}{30} - \frac{5}{30}$

$= \frac{2}{3}$

6) $P(A) = \frac{3}{8}$ $P(B) = \frac{1}{2}$ $P(A \cap B) = \frac{1}{2}$

i) $P(A^c) = 1 - \frac{3}{8} = \frac{5}{8}$

ii) $P(B^c) = 1 - \frac{1}{2} = \frac{1}{2}$

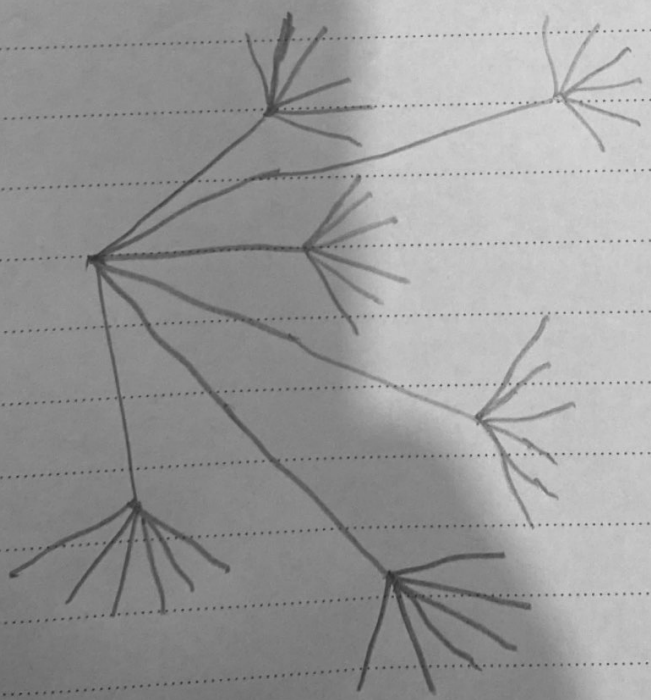
iii) $P(A^c \cap B^c) = P(A \cup B)^c \Rightarrow 1 - \left(\frac{3}{8} + \frac{1}{2} - \frac{1}{2}\right) = \frac{5}{8}$

iv) $P(A^c \cup B^c) = P(A \cap B)^c \Rightarrow 1 - \frac{1}{2} = \frac{1}{2}$

v) $P(A \cap B^c) = \frac{1}{8}$

vi) $P(B \cap A^c) = 0$

7)



$= 1 - \frac{125}{216} = \frac{91}{216}$

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8) $\Sigma P(x) = k^2 - 8$

$1 = k^2 - 8$

$k^2 = 9$

$k = 3$

9) $P(A) = 0.35 \quad P(B) = 0.45$

$P(A' \cap B') = P(A \cup B)' = 1 - (0.35 + 0.45) = \frac{1}{5}$