$$P^{5} = P^{2+3} = P^{2} \times P^{3}$$

$$P = P' = P' \times P' = \begin{bmatrix} 0.8 & 0.19 & 0.01 \\ 0.6 & 0.34 & 0.06 \\ 0 & 0 & 1 \end{bmatrix} \times \begin{bmatrix} 0.8 & 0.19 & 0.01 \\ 0.6 & 0.34 & 0.06 \\ 0 & 0 & 1 \end{bmatrix}$$

$$P^{3} = P^{7+1} = P^{7} \times P^{1} = \begin{bmatrix} 0.754 & 0.2166 & 0.0294 \\ 0.684 & 0.2296 & 0.0864 \end{bmatrix} \times 0.0296$$

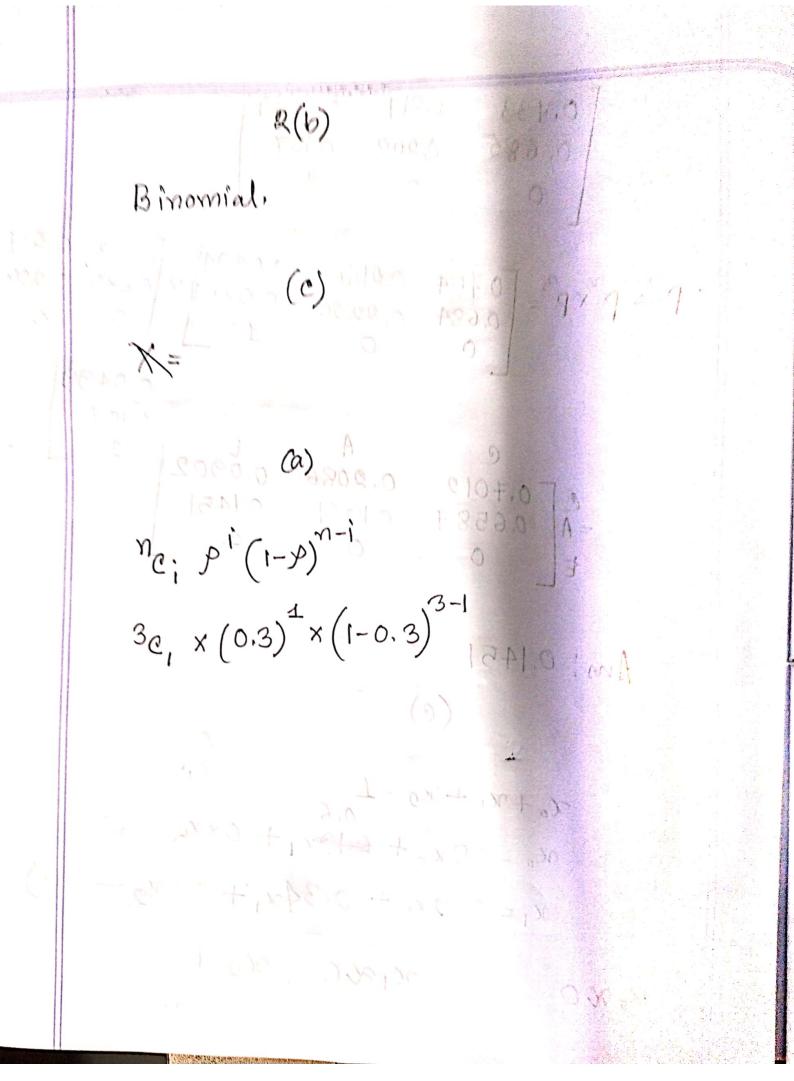
$$= \begin{bmatrix} 0.733 & 0.217 & 0.0499 \\ 0.685 & 0.208 & 0.107 \\ 0 & 0 & 1 \end{bmatrix}$$

$$0.685 & 0.208 & 0.107 \\ 0.75 = P^{x}P^{3} = \begin{bmatrix} 0.754 & 0.2166 & 0.0294 \\ 0.684 & 0.2296 & 0.0864 \\ 0 & 0 & 1 \end{bmatrix}$$

$$0.04999 \\ 0.107 \\ 0.6587 & 0.1961 & 0.1451 \\ 0 & 0 & 1 \end{bmatrix}$$

$$0.04999 \\ 0.107 \\ 1 \\ 0.6587 & 0.1961 & 0.1451 \\ 0 & 0 & 1 \end{bmatrix}$$

$$0.04999 \\ 0.107 \\ 1 \\ 0.67 \\ 1 \\ 0.107$$



3(a) 01=[17] Book 1 -> 2hrs x 2 -> 5hows (1) (1) E 3 - 3 hows, X X = time needed to find the answer and write it in the seript DONE! + + Y=#of book P { Y=13 = P { Y=23 = P { Y-33=13 E[XIY=1] = 2 + E[X] E[X|Y=2] =5 E[X|Y=3] = 3+E[X] ., E[X] = E[X | Y=]. P{Y=1} + E[X | Y=2]. P{Y=2} + E[X1Y=3]. P{Y=3}  $\Rightarrow E[X] = (2 + E[X]) \times \frac{1}{3} + 5 \times \frac{1}{3} + (3 + E[X]) \times \frac{1}{3}$ \$3E[X] = 2+E[X]+5+3+E[X]

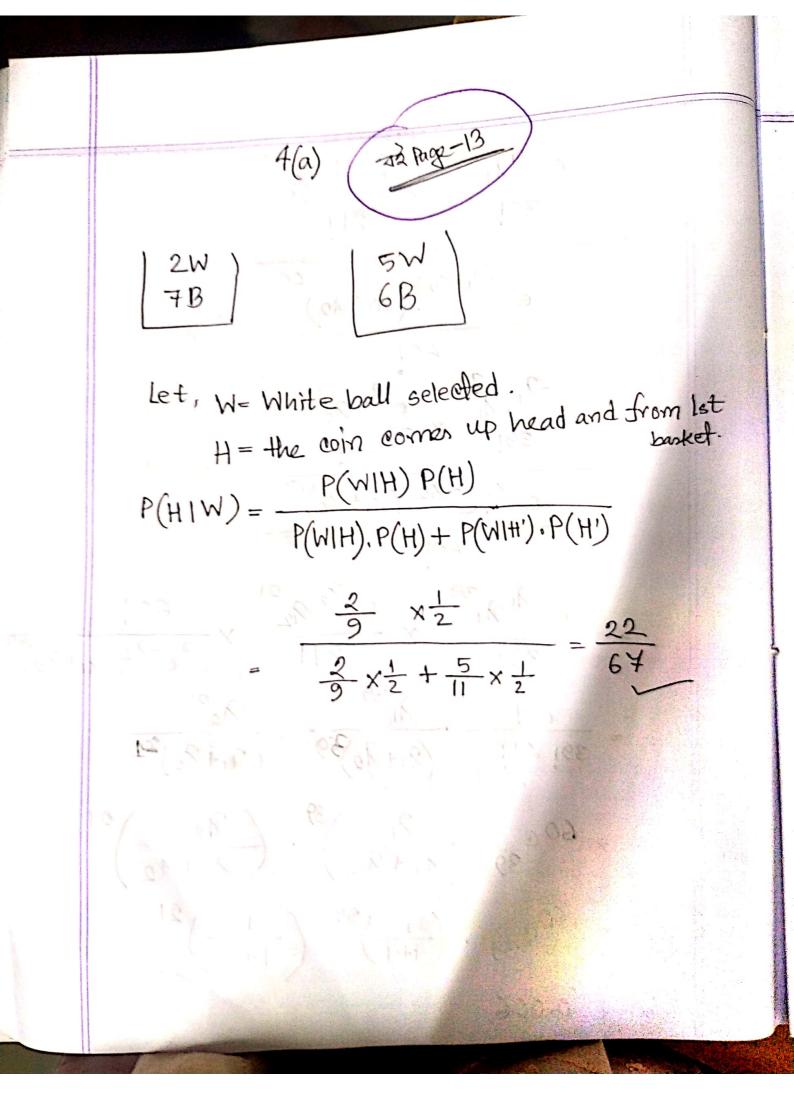
$$n_2 = 1$$

(M)

$$P\{X=39 \mid X+Y=60\} = \frac{P\{X=39, X+Y=60\}}{P\{X+Y=60\}}$$

$$P_{X}=39, Y=21$$

$$\frac{e^{-\lambda_{1}} \frac{39}{39!} \times \frac{e^{-\lambda_{2}} \frac{2!}{2!!}}{2!!}}{\frac{e^{-(\lambda_{1}+\lambda_{2})} (\lambda_{1}+\lambda_{2})^{60}}{60!}} \times \frac{e^{-\lambda_{1}} \frac{39}{\lambda_{2}} \times \frac{e^{-\lambda_{2}} \frac{2!}{\lambda_{2}}}{2!!}}{\frac{e^{-\lambda_{1}} e^{-\lambda_{2}} (\lambda_{1}+\lambda_{2})^{60}}{60!}} \times \frac{e^{-\lambda_{1}} \frac{39}{\lambda_{2}} \times \frac{e^{-\lambda_{2}} \frac{2!}{\lambda_{2}}}{2!!} \times \frac{60!}{e^{-\lambda_{2}} (\lambda_{1}+\lambda_{2})^{60}}}{\frac{60!}{39!} \frac{\lambda_{1}}{\lambda_{1}} \times \frac{39}{\lambda_{2}} \times \frac{\lambda_{2}}{\lambda_{1}+\lambda_{2}}} \times \frac{60!}{\frac{\lambda_{1}+\lambda_{2}}{\lambda_{1}}} \times \frac{60!}{\frac{\lambda_{1}+\lambda_{2}}$$



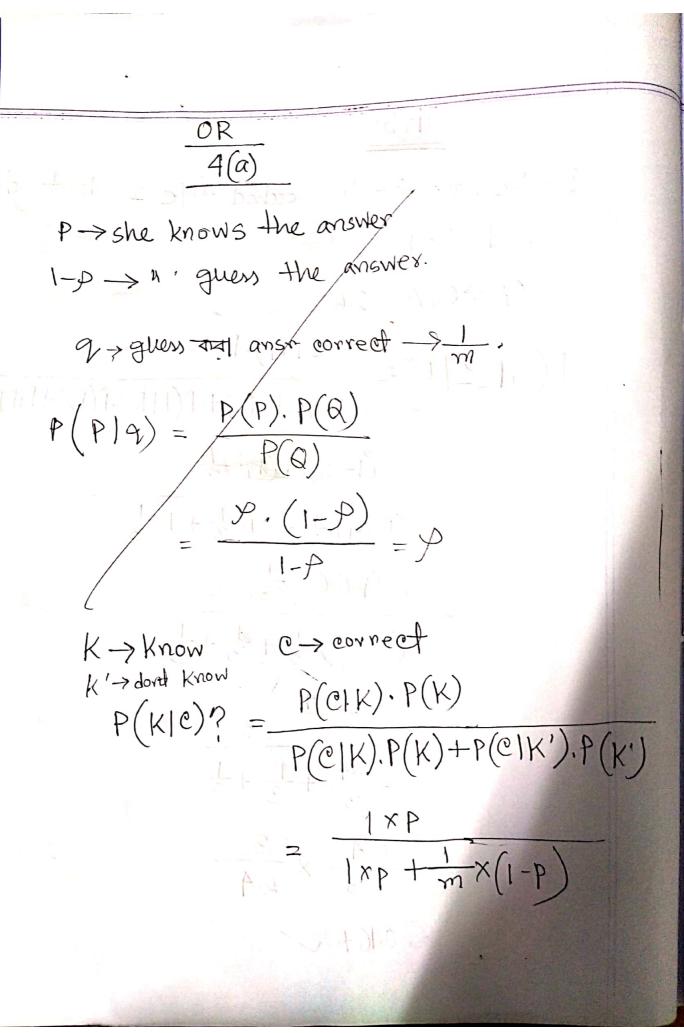
E = We have abready searched file 1 but did not find the letter 'm'

$$P(F_{i} \neq 1 | E) = \frac{P(E|F_{i}).P(F_{1})}{P(E|F_{1}).P(F_{1}) + P(E|F_{2}).P(F_{2}) + P(E|F_{3}).P(F_{3})}$$

$$=\frac{(1-0.6)\cdot\frac{1}{3}+\frac{1}{3}+\frac{1}{3}}{(1-0.6)\cdot\frac{1}{3}+\frac{1}{3}+\frac{1}{3}}$$

$$= \frac{0.4}{3} + \frac{1}{3} + \frac{1}{3}$$

$$=\frac{0.4}{3}\times\frac{3}{2.4}$$



4(b)

1st basket >> 2 W

7 800

1000

Concrete math book 1-1

Probability book

X→ No. of mispelled words

 $\left(\frac{7}{800} \times \frac{1}{2}\right) + \left(\frac{13}{1000}\right) \times \frac{1}{2}$