H.W2 S.W.E محمد عبد الله محمد بدوي

① $\frac{12!}{4!^3 \cdot 3!} = 5775$

② a < b-c abc, c-b acb
b < a-c bac, c-a bca
c < a-b cab, b-a cba
$n=3 \quad n! = 3! = 6$

③ i; $P(A) = \frac{1}{3} \cdot \frac{3}{11} = \frac{1}{11}$ $P(B) = \frac{2}{3} \cdot \frac{7}{11} = \frac{14}{33}$

ii; P(at least one item is detective) $= 1 - P(B) = 1 - \frac{14}{33} = \frac{19}{33}$

④ i; $\frac{10C3}{15C3} = \frac{24}{91}$

ii; $\frac{(6C1) \cdot (10C2)}{15C3}$

iii: $\frac{(15C3) - (10C3)}{15C3} = \frac{67}{91}$

⑤ $P(\text{boy}) = \frac{10}{30} = \frac{1}{3}$
$P(\text{from Mansoura}) = \frac{15}{30} = \frac{1}{2}$
$P(\text{boy and Mansoura}) \frac{5}{30} = \frac{1}{6}$
$P(\text{boy or from Mansoura}) \frac{1}{3} + \frac{1}{2} - \frac{1}{6} = 5/6$

⑥ i: $P(A^c) = 1 + P(A) = 1 - \frac{3}{8} = \frac{5}{8}$
ii: $P(B^c) = 1 - P(B) = 1 - \frac{1}{2} = \frac{1}{2}$
iii: $\frac{3}{8} + \frac{1}{2} - \frac{1}{2} = \frac{3}{8}$ $P(A^c \text{ intersection } B^c) = 1 - P(A \text{ union } B)$ is $1 - \frac{3}{8} = \frac{5}{8}$

iv: $P(A^c \text{ union } B^c) = 1 - P(A \text{ intersection } B) = 1 - \frac{1}{2} = \frac{1}{2}$

v: $P(A \cap B') = P(A) - P(A \cap B) = \frac{3}{8} - \frac{1}{2}$ $\frac{3}{8} - \frac{4}{8} = \frac{1}{8}$

vi: $P(B \text{ inversection } A^c) = P(B) - P(A \text{ inversption } B) = \frac{1}{2} - \frac{1}{2} = 0$

⑦ $E = \{(1,6), (2,5), (3,4), (4,3), (5,2), (6,1)\}$

$|E| = 6$ $\quad P(E) = \frac{6}{36} = \frac{1}{6}$

$|S| = 36$ $\quad P(E^c) = 1 - (\frac{1}{6})^3 = \frac{125}{216}$

⑧ $\sum P(x) = k^2 - 8 \mid k^2 = 9$

$1 - k^2 - 8 \mid k = 3$

⑨ $P(A' \cap B') = P((A \cup B)') = 1 - P(A \cup B)$

$P(A \cup B) = P(A) + P(B) = 0,35 + 0,45 = 0,8$

$P(A' \cap B') = 1 - 0,8 = 0,2$