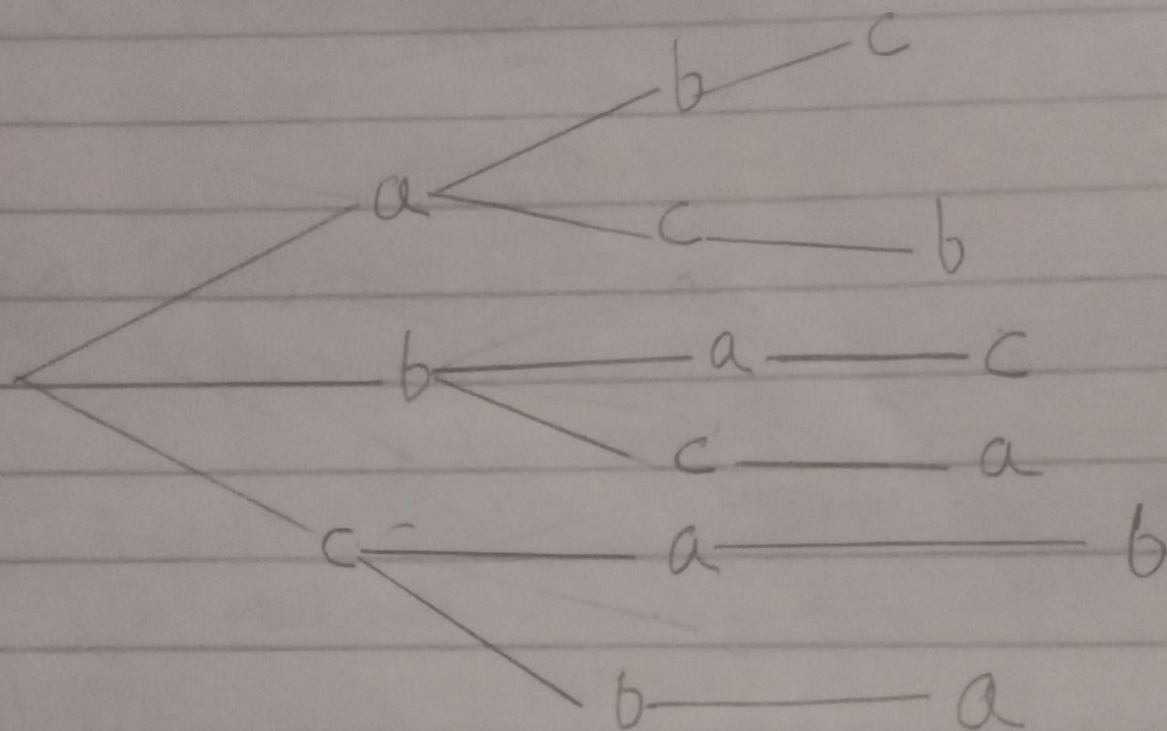


Subject:

$$1) \quad {}^{12}C_4 \cdot {}^8C_4 \cdot {}^4C_4 = \frac{12!}{4!(12-4)!}$$

$$\frac{8!}{4!(8-4)!} \cdot \frac{4!}{4!(4-4)!} = 495 \times 70 \times 1$$
$$= 34650$$

2)



$$3) \quad P(A) = {}^4C_{12} \cdot {}^3C_{11} = 0,109$$

$$P(B) = {}^8C_{12} \cdot {}^7C_{11} = 0,381$$

$P(\text{at least one item is defective})$

$$= 1 - P(B) = 1 - 0,381 = 0,619$$

$$4) S = {}^{15}C_3 = \frac{15!}{3!(15-3)!} = 455$$

$$P(\text{none defective}) = \frac{{}^{10}C_3}{455} = 0,2637$$

$$P(\text{one items is defective}) = \frac{{}^5C_1 \cdot {}^{10}C_2}{455}$$

$$= 0,4945$$

$$P(\text{at least one defective}) = 1 - P(\text{none defective}) = 1 - 0,2637 = 0,7363$$

5)	A = boys	girls	boys	total
	B = mansoura	20	10	30
	Mansoura	10	5	15

$$P(A \cup B) =$$

$$P(A) + P(B) - P(A \cap B) = \frac{10}{30} + \frac{15}{30} - \frac{5}{30} = \frac{20}{30}$$

$$8) \sum P(X) = 1$$

$$K^2 - 8 = 1 \Rightarrow K = 3$$

$$9) P(A \cup B) = P(A) + P(B) = 0,45 + 0,35 = 0,8$$

$$P(\bar{A} \cap \bar{B}) = 1 - P(A \cup B) \\ = 1 - 0,8 = 0,2$$

7) $S = 6 \times 6 = 36 \Rightarrow$ one rolling

Outcomes add to 7 :-

$(1,6), (2,5), (3,4), (4,3), (5,2), (6,1)$

$P(\text{rolling a 7}) = \frac{6}{36}$
not

$P(\text{not rolling a 7}) = 1 - \frac{6}{36} = \frac{30}{36} = \frac{5}{6}$

$P(\text{rolling a 7 all three times rolling}) =$

$\frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} = \frac{125}{216}$

$P(\text{at least rolling a 7 all three times}) =$
 $1 - \frac{125}{216} = \frac{91}{216}$

6) $P(A') = 1 - P(A) = 1 - \frac{3}{8} = \frac{5}{8}$

$P(B') = 1 - P(B) = 1 - \frac{1}{2} = \frac{1}{2}$

$P(\bar{A} \cap \bar{B}) = 1 - P(A \cup B) = 1 - \frac{3}{8} = \frac{5}{8}$

$P(\bar{A} \cup \bar{B}) = 1 - P(A \cap B) = 1 - \frac{1}{2} = \frac{1}{2}$