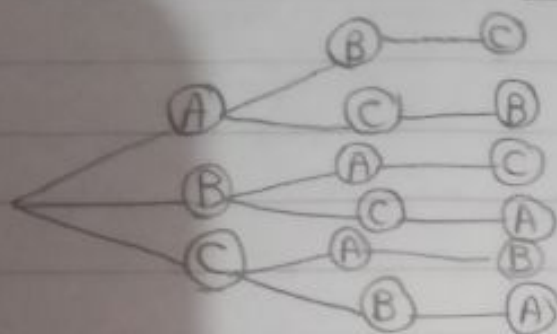


$$1) {}^{12}C_4 \cdot {}^8C_4 \cdot {}^4C_4 = 34650$$

2)



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

$$P(B) = {}^8C_{12} \cdot {}^7C_{11} = ,0381$$

$$P(\text{At least one item is defective}) = 1 - ,381 = ,619$$

$$4) P(\text{none defective}) = \frac{{}^{10}C_3}{455} = ,2637$$

$$P(\text{one item is defective}) = \frac{{}^5C_1 \cdot {}^{10}C_2}{455} = ,4945$$

$$P(\text{At least one defective}) = 1 - ,2637 = ,7363$$

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

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

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

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

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

$$(v) P(A \cap B^c) = \frac{3}{8} - \frac{1}{2} = -\frac{1}{8} = 0$$

$$(vi) P(B \cap A^c) = \frac{1}{2} - \frac{1}{2} = 0$$

$$7) P(\text{rolling a 7 all three rolling}) = {}^5C_6 \times {}^5C_6 \times {}^5C_6 = \frac{125}{216}$$

$$8) k^2 - 8 = 1 \quad \therefore k = 3$$

$$9) P(A^c \cap B^c) = 1 - (,35 + ,45) = ,2$$