Grade 12 GS

Probability ex 14

By Mr.Kassem Hodeib

K.H

K.H

K.H

Exercise 14: "If then question or two actions:

An urn U contains **six** balls: **four** red balls and **two** blue balls.

A bag S contains **five** bills: **one** 50 000 LL bill, **two** 20 000 LL bills and **two** 10 000 LL bills.
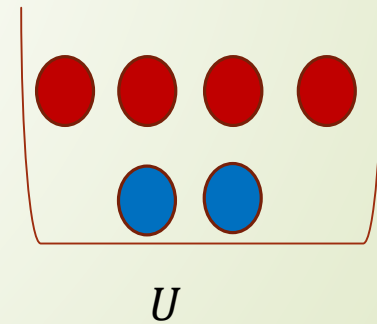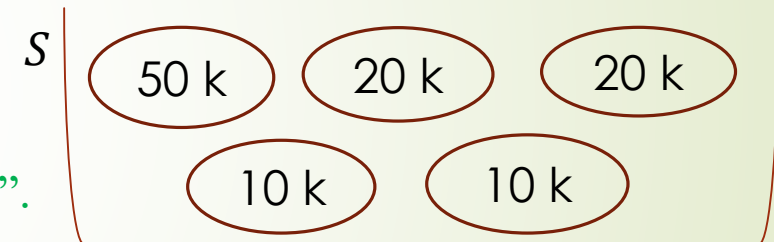
Part A: One ball is randomly drawn from U

If this ball is red, then **two** bills are drawn successively without replacement at random from S.
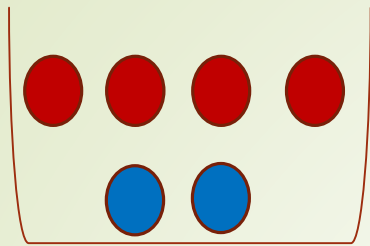
If this ball is blue, then **three** bills are drawn simultaneously at random from S.

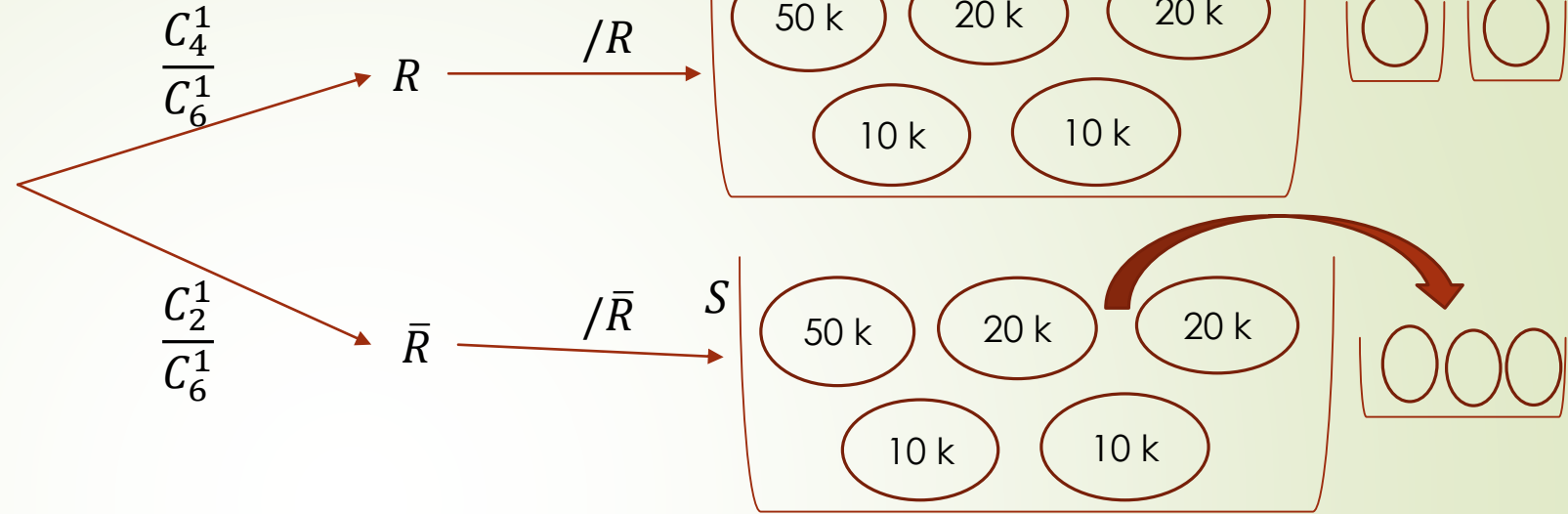Consider the following events:

   R: "the drawn ball is red".

   A: "the sum of the values of the bills drawn is 70 000 LL".

S

50 k   20 k   20 k

10 k   10 k

U

K.H

U

- *one ball drawn from* U:

$\dfrac{C_4^1}{C_6^1}$ → R → $/R$ → S

50 k 20 k 20 k 10 k 10 k

$\dfrac{C_2^1}{C_6^1}$ → $\bar{R}$ → $/\bar{R}$ → S

50 k 20 k 20 k 10 k 10 k

1) a- Calculate the probability $P(A/R)$ and deduce that $P(A \cap R)$=2/15.

- $P(A/R)= \dfrac{1}{5} \times \dfrac{2}{4} \times 2! \ = \dfrac{1}{5}$ • $P(A \cap R)= \ P(A/R) \times P(R) = \dfrac{1}{5} \times \dfrac{4}{6} = \dfrac{2}{15}$

b- Calculate P(A∩$\bar{R}$) and deduce P(A).

- $P(A \cap \bar{R})= \ P(A/\bar{R}) \times P(\bar{R}) = \dfrac{C_2^2 \times C_1^1}{C_5^3} \times \dfrac{2}{6} = \dfrac{1}{30}$

- P(A)= $P(A \cap R) + P(A \cap \bar{R}) = \dfrac{2}{15} + \dfrac{1}{30} = \dfrac{1}{6}$

3) Knowing that the sum of the values of the drawn bills is 70000 LL, what is the probability that the ball selected from U is red?

- $P(R/A) = \dfrac{P(R \cap A)}{P(A)} = \dfrac{\frac{2}{15}}{\frac{1}{6}} = \dfrac{4}{5}$

Part B:

In this part, **two** bills are drawn successively with replacement at random from the bag S.

Calculate P(sum of drawn bills $\geq$ 70000).

- $P(S \geq 70 \text{ k})) = P(sum\ is\ 70k) + \text{P(Sum is } 100\ k)$

  $= P(50k\ 20k\ or\ 20k\ 50k) + \text{P}(50k\ 50k)$

  $= \left(\dfrac{1}{5} \times \dfrac{2}{5} + \dfrac{2}{5} \times \dfrac{1}{5}\right) + \dfrac{1}{5} \times \dfrac{1}{5} = \dfrac{1}{5}$

S | 50 k | 20 k | 20 k
| 10 k | 10 k