P3 2016

1. $E\{X\}=10 \quad E\{XY\}=60$, X, Y indep.

$\Rightarrow E\{Y\}=\frac{60}{10}=6$

$\sigma_X = 10 \quad \sigma_Y = 10$

$E\{X^2+Y^2\} = \sigma_X^2 + E\{X\}^2 + \sigma_Y^2 + E\{Y\}^2$

$= 100 + 100 + 100 + 36 = 336.$

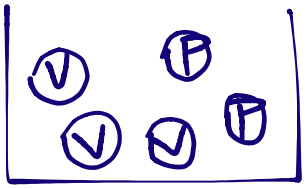
2. $E\{XY \mid Y=2\} = ?$

	$Y=2$	XY	$P(XY \mid Y=2)$
$X=1$	$6k$	2	$0,6$
$X=2$	$3k$	4	$0,3$
$X=3$	$1k$	6	$0,1$
	$10k$		

$E\{XY \mid Y=2\} = 2\times 0,6 + 4\times 0,3 + 6\times 0,1$

$= 1,2 + 1,2 + 0,6 = 3,0.$

3. $D=6mm \quad P(C=12 \mid D=6)=\frac{0,4}{0,5}=0,8$

4. 

$P(X=2,Y=0)=\frac{3}{5}\times\frac{2}{4}=\frac{3}{10}$

$P(X=1,Y=1)=\frac{3}{5}\times\frac{2}{4}$

Sem reposição

$+\frac{2}{5}\times\frac{3}{4}$

$=\frac{3}{5}=0,6.$

$P(X=0,Y=2)=\frac{2}{5}\times\frac{1}{4}=\frac{1}{10}.$

Y \ X	0	1	2
0	0	0	0,3
1	0	0,6	0
2	0,1	0	0

$E\{XY\}=1\times 0,6$

$E\{X\}=1\times 0,6+2\times 0,3$

$=1,2$

$E\{Y\}=1\times 0,6+2\times 0,1$

$=0,8$

$Cov(X,Y)=0,6-1,2\times 0,8$

$=0,6-0,96=-0,36.$

5. $E\{Y=y_4\}=0,25$

$E\{X=x_3\}=0,3$

$E\{X=x_2\}=0,16+b$

$\Rightarrow (0,16+b)\cdot 0,25=0,05$

$0,16+b=0,2$

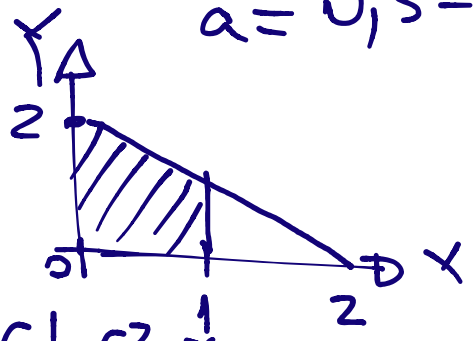
$\Rightarrow b=0,04.$

$E\{X=x_1\}=0,35+a$

$(0,35+a)\cdot 0,25=0,125$

$a=0,5-0,35=0,15.$

Q1.



a) $\int_0^1 \int_0^{2-x} \alpha x y \, dy \, dx = 1$

$\alpha \int_0^1 x \int_0^{2-x} y \, dy \, dx = \alpha \int_0^1 x \frac{(2-x)^2}{2} dx$

$= \frac{\alpha}{2} \int_0^1 [4x - 4x^2 + x^3] dx$