7.10) $P(D=d) = C\,\frac{2^d}{d!}$, $d = 1, 2, 3, 4$

a) $C = ?$

$$\sum_{\forall i} p(d_i) = 1 \Rightarrow C\frac{2^1}{1!} + C\frac{2^2}{2!} + C\frac{2^3}{3!} + C\frac{2^4}{4!} = 1$$

$$C\left[2 + 2 + \frac{4}{3} + \frac{2}{3}\right] = 1 \Rightarrow C = \frac{3}{18} = \frac{1}{6}$$

b) $E(D) = \sum_{\forall i} d_i\, p(d_i)$

$$\frac{1}{6}\left[1*2 + 2*2 + 3*\frac{4}{3} + 4*\frac{2}{3}\right] = \frac{1}{6}\left[\frac{18+12+8}{3}\right] = \frac{38}{18} = \frac{19}{9}$$

c) $T \rightarrow$ lucro ; $K \rightarrow$ produção ; $D \rightarrow$ demanda

falta: 0 — K — D

excesso: 0 — D — K

$$T = \begin{cases} 5K, & \text{se } D > K \\ 5D - 3(K-D), & \text{se } D \le K \end{cases}$$

K = 0

D	1	2	3	4
$p(d_i)$	3/9	3/9	2/9	4/9
L	0	0	0	0

$E(L \mid K=0) = 1*0 = 0$

K = 1

$p(l_i)$	1			
L	5	5	5	5

$E(L \mid K=1) = 1*5 = 5$

K = 2

$p(l_i)$	1			
L	(5*1 − 3*1) 2	(5*2) 10	(5*2) 10	(5*2) 10
$p(l_i)$	3/9	$\frac{3+2+1}{9} = \frac{6}{9}$		

$E(L \mid K=2) = 2*\frac{3}{9} + 10*\frac{6}{9} = 7{,}3$

K = 3

L	(5*1 − 3*2) −1	(5*2 − 3*1) 7	(5*3) 15	(5*3) 15
$p(l_i)$	3/9	3/9	$\frac{2+1}{9} = 3/9$	

$E(L \mid K=3) = (-1)\cdot\frac{3}{9} + 7\cdot\frac{3}{9} + 15\cdot\frac{3}{9} = 7$

K = 4 deve ter $E(L \mid K=4) < E(L \mid K=3)$, pois L vai decrescendo quando K aumenta

K ÓTIMO :

$E(L \mid K=2) = 7{,}3$