

Pauta Control 2 Probabilidades y Estadísticas Primavera 2009

a) u : corte

$$f_u = 1 \quad (0,5)$$

L_p = largo de la barra que contiene a p

$$L_p = \begin{cases} 1 - u & p > u > 0 \\ u & 0 < p < u < 1 \end{cases} \quad (1,0)$$

$$\begin{aligned} E(L_p) &= \int_0^1 L_p * f_u du && (1,5) \\ &= \int_0^p (1 - u) du + \int_p^1 u du \\ &= p - p^2 + \frac{1}{2} \end{aligned}$$

b) $x_i \rightarrow U(0, 80)$ Experimento i -esimo

$$f_x = \frac{1}{80} \quad (0,5)$$

$$\begin{aligned} P(\max > 40) &= 1 - P(\max < 40) && (1,0) \\ &= 1 - \prod_{i=1}^{100} P(x_i < 40) \end{aligned}$$

$$P(x_i < 40) = \int_0^{40} f_x dx = \int_0^{40} \frac{1}{80} dx = \frac{1}{2} \quad (1,0)$$

$$P(\max > 40) = 1 - \prod_{i=1}^{100} \frac{1}{2} = 1 - (1/2)^{100} \quad (0,5)$$