P.S 7 Q3

Given 10% refusal rate for women
20% refusal rate for men

Sample employment rate, women = 0.86
Sample employment rate, men = 0.92

⇒ A) for women

$$Pr(R=1|E) \cdot f_1(E) \leq f_w(E) \leq Pr(R=1|E) \cdot f_1(E) + Pr(R=0|E) \cdot 1$$

$$0.9 \times 0.86 \leq f_{women}(E) \leq 0.9 \times 0.86 + 0.1 \times 1$$

Percent = $77.4\% \leq f_{women}(E) \leq 87.4\%$

Bounds on employment rate for women = $[77.4\%, 87.4\%]$

$= [0.774, 0.874]$

⇒ B) Men

$$Pr(R=1|E) \cdot f_1(E) \leq f_{men}(E) \leq Pr(R=1|E) \cdot f_1(E) + Pr(R=0|E)$$

$$0.8 \times 0.92 \leq f_{men}(E) \leq 0.8 \times 0.92 + 0.2$$

$$0.736 \leq f_{men}(E) \leq 0.9360$$

Bounds on employment rate for men = $[73.6\%, 93.6\%]$

$[0.736, 0.936]$

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3c) Combined Sample

Assumption where men and women are half of sample.

$$P_r(R=1|E) \cdot f_E(E) = \frac{1}{2}[0.9 \times 0.86 + 0.8 \times 0.92]$$

$$= \frac{1}{2}[1.51] = 0.755 \,|\, 75.5\%$$

$$P_r(R=0|E) \cdot 1 = \frac{1}{2}[0.1 + 0.2]$$

$$= 0.15 \,|\, 15\%$$

$$P_r(R_T=1|E) \cdot f_c(E) \leq f_{combined}(E) \leq P_r(R=1|E) \cdot f_1(E) + P_r(R=0|E) \cdot 1$$

$$0.755 \leq f_{combln}(E) \leq 0.755 + 0.15$$

Bounds of employment rate on the entire combined sample $= [0.755, 0.905]$

$= [75.5\%, 90.5\%]$.