



Mi Universidad

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Nombre del tema: Ejercicios Prácticos de Muestreo.

Parcial: Unidad I

Nombre de la Materia: Estadística Inferencial.

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Nombre de la Licenciatura: Psicología

Cuarto Cuatrimestre.

1. En un municipio se pretende realizar una encuesta sobre la opinión de las personas de un producto nuevo de limpieza el cual cuenta con 45000 casas de casa, por lo tanto, entrevistar a todas sería tedioso y costoso, por lo cual se ha tomado la decisión de obtener una muestra. No existen datos anteriores para estimar el valor de p (trabájelo como un error de estimación de 3%).

$$N = 45000$$

$$p = 50\% = 0.5$$

$$q = 1 - p = 1 - 0.5 = 0.5$$

$$B = 3\%$$

$$n = 1,084.36 \quad \text{f}$$

$$D = \frac{B^2}{4} = \frac{(0.03)^2}{4} = 0.000225$$

$$n = \frac{Npq}{(n-1)D + pq} = \frac{(45000)(0.5)(0.5)}{(44999)(0.000225) + (0.5 \times 0.5)}$$

$$n = 45000 \times 0.5 \times 0.5 = \frac{1}{4} [(44999 \times 0.000225) + (0.5 \times 0.5)]$$

$$n = 1,084.36 \quad \text{f}$$

2. En un municipio se pretende realizar una encuesta sobre la opinión de las personas de un producto de limpieza, el cual cuenta con 20000 casas de casa, por lo tanto, una encuesta llevada a cabo el año pasado arrojó que el 72.5% de las personas están satisfechas con este producto (trabájelo con un error de estimación de 5%).

$$N = 20000$$

$$p = 72.5\% = 0.725$$

$$q = 1 - p = 1 - 0.725 = 0.275$$

$$B = 5\% = 0.05$$

$$n = 314 \quad \text{f}$$

$$D = \frac{B^2}{4} = \frac{(0.05)^2}{4} = 0.000625$$

$$n = \frac{Npq}{(n-1)D + pq} = \frac{(20000)(0.725)(0.275)}{(19999)(0.000625) + (0.725 \times 0.275)}$$

$$n = 20000 \times 0.725 \times 0.275 = \frac{1}{4} [(19999 \times 0.000625) + (0.725 \times 0.275)]$$

$$n = 314 \quad \text{f}$$

$$3^{\circ} N = 50000$$

$$p = 76\% = 0.76$$

$$q = 1 - p = 1 - 0.76 = 0.24$$

$$B = 4\% = 0.04$$

$$n = \underline{452} \ell$$

$$D = \frac{B^2}{4} = \frac{(0.04)^2}{4} = 0.0004$$

$$n = \frac{Npq}{(N-1)D + pq} = \frac{(50000)(0.76)(0.24)}{(49999)(0.0004) + (0.76 \times 0.24)}$$

$$n = 50000 \times 0.76 \times 0.24 = \div ((49999 \times 0.0004) + (0.76 \times 0.24))$$

$$n = 451.88 \quad \simeq \quad n = \underline{452} \ell$$

$$4^{\circ} N = 10000$$

$$p = 50\% = 0.5$$

$$q = 1 - p = 0.5 - 1 = 0.5$$

$$B = 5\% = 0.05$$

$$n = \underline{385} \ell$$

$$D = \frac{B^2}{4} = \frac{(0.05)^2}{4} = \frac{0.0025}{4} = 0.000625$$

$$n = \frac{Npq}{(N-1)D + pq} = \frac{(10000)(0.5)(0.5)}{(9999)(0.000625) + (0.5 \times 0.5)}$$

$$n = 10000 \times 0.5 \times 0.5 = \div ((9999 \times 0.000625) + (0.5 \times 0.5))$$

$$n = 384.65 \quad \simeq \quad n = \underline{385} \ell$$

$$5^{\circ} N = 25000$$

$$p = 55\% = 0.55$$

$$q = 1 - p = 0.55 - 1 = 0.45$$

$$B = 2\% = 0.02$$

$$n = \underline{2'252.12} \ell$$

$$D = \frac{B^2}{4} = \frac{(0.02)^2}{4} = \frac{0.0004}{4} = 0.0001$$

$$n = \frac{Npq}{(N-1)D + pq} = \frac{(25000)(0.55)(0.45)}{(24999)(0.0001) + (0.55 \times 0.45)}$$

$$n = 25000 \times 0.55 \times 0.45 = \div ((24999 \times 0.0001) + (0.55 \times 0.45))$$

$$n = \underline{2'252.12} \ell$$

$$\begin{aligned}
 6\% \quad N &= 15\,000 \\
 p &= 66\% = 0.66 \\
 q &= 1-p = 1-0.66 = 0.34 \\
 B &= 3\% = 0.03 \\
 n &= \underline{936} \ell
 \end{aligned}$$

$$D = \frac{B^2}{4} = \frac{(0.03)^2}{4} = 0.000225$$

$$n = \frac{Npq}{(N-1)D + pq} = \frac{(15\,000)(0.66)(0.34)}{(14\,999)(0.000225) + (0.66 \times 0.34)}$$

$$\begin{aligned}
 n &= 15\,000 \times 0.66 \times 0.34 = \frac{339900}{((14\,999 \times 0.000225) + (0.66 \times 0.34))} \\
 n &= 935.21 \approx n = \underline{936} \ell
 \end{aligned}$$

$$\begin{aligned}
 7\% \quad N &= 250\,000 \\
 p_1 &= 65\% = 0.65 \\
 q_1 &= 1-0.65 = 0.35 \\
 B_1 &= 2\% = 0.02
 \end{aligned}$$

$$D_1 = \frac{B^2}{4} = \frac{(0.04)^2}{4} = 0.0001$$

$$n_1 = 2,254.49 = \underline{2,255} \ell$$

$$p_2 = 50\% = 0.5$$

$$q_2 = 1-0.5 = 0.5$$

$$B_2 = 3\% = 0.03$$

$$D_2 = \frac{B^2}{4} = \frac{(0.03)^2}{4} = 0.000225$$

$$n_2 = \underline{1,107} \ell$$

$$n_1 = \frac{Npq}{(N-1)D + pq} = \frac{(250\,000)(0.65)(0.35)}{(249\,999)(0.0001) + (0.65 \times 0.35)}$$

$$n_1 = 2,254.49 \approx n_1 = \underline{2,255} \ell$$

$$n_2 = \frac{Npq}{(N-1)D + pq} = \frac{(250\,000)(0.5)(0.5)}{(249\,999)(0.000225) + (0.5 \times 0.5)}$$

$$n_2 = 1,106.19 \approx n_2 = \underline{1,107} \ell$$

$$8\% \quad N = 35000$$

$$p_1 = 55\% = 0.55$$

$$q_1 = 1 - 0.55 = 0.45$$

$$B_1 = 5\% = 0.05$$

$$n_1 = 391.58 \approx n_1 = \underline{392} \ell$$

$$D_1 = \frac{B^2}{4} = \frac{(0.05)^2}{4} = 0.000625$$

$$p_2 = 52\% = 0.52$$

$$q_2 = 1 - 0.52 = 0.48$$

$$B_2 = 3\% = 0.03$$

$$n_2 = 1,075.28 \approx n_2 = \underline{1,076} \ell$$

$$D_2 = \frac{B^2}{4} = \frac{(0.03)^2}{4} = 0.000225$$

$$\frac{n_1 = NPq}{(N-1)D + Pq} = \frac{(35000)(0.55)(0.45)}{(34999)(0.000625) + (0.55 \times 0.45)}$$

$$n_1 = 35000 \times 0.55 \times 0.45 = \div ((34999 \times 0.000625) + (0.55 \times 0.45))$$

$$n_1 = 391.58 \approx n_1 = \underline{392} \ell$$

$$\frac{n_2 = NPq}{(N-1)D + Pq} = \frac{(35000)(0.52)(0.48)}{(34999)(0.000225) + (0.52 \times 0.48)}$$

$$n_2 = 35000 \times 0.52 \times 0.48 = \div ((34999 \times 0.000225) + (0.52 \times 0.48))$$

$$n_2 = 1,075.28 \approx n_2 = \underline{1,076} \ell$$