1.

SALÁRIO ANUAL	NÚMERO DE FUNCIONÁRIOS (f_i)	x_i	fac	$x_i f_i$	$(x_i - \bar{x})^2$
$<0,10]$	250	5	250 *	1250	285,61
$<10,20]$	300 *	15	550	4500	47,61
$<20,30]$	200	25	750	5000	9,61
$<30,40]$	120	35	870	4200	171,61
$<40,50]$	60	45	930	2700	533,61
$<50,60]$	40	55	970	2200	1095,61
$<60,70]$	20	65	990	1300	1857,61
$<70,80]$	10	75	1000	750	2819,61
TOTAL	1000	—	—	21900	—

i) $\bar{x} = \frac{\sum_{i=1}^{8} x_i f_i}{n} = \frac{21900}{1000} = 21,9$

ii) $M_0 = 10 + \left(\frac{300-250}{(300-250)+(300-200)}\right) \cdot 10 = 10 + \left(\frac{50}{150}\right) \cdot 10 = 10 + \frac{500}{150} = \frac{150+50}{15} = \frac{200}{15}$

$M_0 = 13,33$

iii) $P_1 = \frac{1000}{4} = 250$ $\quad Q_1 = 0 + \left(\frac{250-0}{250}\right) 10 = \frac{250}{250} \cdot 10 = 10$

iv) $s^2 = \frac{\sum_{i=1}^{8} (x_i - \bar{x})^2 f_i}{n-1} = \frac{249390}{999} = 249,64$

$s_x = \sqrt{s_x^2} = \sqrt{249,64} = 15,79$

$CV = \frac{15,79}{21,9} \cdot 100 = 72,1\%$

2- i) V = Tomou vacina = 0,8

V^c = Não tomou vacina = 0,2

C = Ficou curada

$P(C/V) = \frac{1}{2}$ $\quad P(C/V^c) = \frac{1}{30}$ R: 0,4067 ou 40,67%

$P(C) = P(C/V).P(V) + P(C/V^c).P(V^c)$

$= \frac{1}{2}.0,8 + \frac{1}{30}.0,2 = \frac{0,8}{2} + \frac{0,2}{30} = \frac{12+0,2}{30} = \frac{12,2}{30} = 0,4067 = 40,67\%$

ii) $P(V/C) = \frac{P(V \cap C)}{P(C)} = \frac{P(V).P(C/V)}{P(C)} = \frac{0,8.1.30}{2.12,2} = \frac{24}{24,4} = 0,9836 = 98,36\%$

R: 0,9836 ou 98,36%

3- i) $P(400) = \frac{10}{10000} = 0,001$ ou 0,1%

ii) $P(0) = 1 - \frac{10}{10000} + \frac{50}{10000} + \frac{400}{10000} = 1 - \frac{460}{10000} = 0,954$ ou 95,4%

iii) $E(\text{Bruto}) = (0,001 \times 400 + 0,005 \times 200 + 0,04 \times 100) = 0,4 + 1 + 4 = 5,40$

R = R$ 5,40

iv) 8 - 5,40 = 2,60 por bilhete, logo, 2,60.10000 = 26.000

R = R$ 26.000 de lucro total!

4- i) $P(X=0) = \binom{10}{0}(0,3)^0(0,7)^{10} = 1.1.0,028 = 0,028$ R: 0,028 ou 2,8%

ii) $P(X=0) = 0,028$

$P(X=1) = \binom{10}{1}(0,3)^1(0,7)^9 = 10.0,3.0,7^9 = 0,121$

$P(X \geq 2) = 1 - 0,028 - 0,121 = 0,851$

R 0,851 ou 85,1%

5_i) $N = \text{Não acerta} = \frac{1}{4} = 0{,}25$

Acerta $= 0{,}75$

$n = 4$

$P(X=0) = \binom{4}{0}(0{,}75)^0 \cdot (0{,}25)^4 = 0{,}0039$

$P(X=1) = \binom{4}{1}(0{,}75)^1 (0{,}25)^3 = 0{,}0468$

$P(X=2) = \binom{4}{2}(0{,}75)^2 (0{,}25)^2 = 0{,}2109$

$P(X \leq 2) = P(X=0) + P(X=1) + P(X=2) = 0{,}2616 = \underline{26{,}16\%}$

ii) $E(X) = n.p = 4.0{,}75 = 3$ ← A cada pesquisador

Logo, $3.500 = \underline{1500}$ pessoas

6_i) $P(X=0) = \dfrac{\binom{4}{0}\binom{46}{8}}{\binom{50}{8}} = 0{,}486$ $\quad P(X=1) = \dfrac{\binom{4}{1}\binom{46}{7}}{\binom{50}{8}} = 0{,}398$

R: 0,398 ou 39,8%

ii) $P(X \geq 2) = 1 - P(X=0) - P(X=1)$

$= 1 - 0{,}486 - 0{,}398 = 0{,}116$

R: 0,116 ou 11,6%

iii) $V(X) = npq\left(\frac{N-n}{N-1}\right) = 8.\left(\frac{4}{50}\right)\left(\frac{46}{50}\right)\left(\frac{50-8}{49}\right) = 0{,}505 - 1$ ou 50,5%

7_i) $P(X=0) = \dfrac{(5)^0 \cdot e^{-5}}{0!} = \dfrac{1.e^{-5}}{1} = 0{,}0067$ ou 0,67%

ii) $P(X=1) = \dfrac{5^1 e^{-5}}{1!} = 5e^{-5} = 0{,}0337$ ou 3,37%

$P(X>1) = 1 - P(X=0) - P(X=1)$

$= 1 - 0{,}0067 - 0{,}0337$

$= 0{,}9596$ ou 95,96%