Distribution Assignment

2.

a) $P(n > 50000) = 1 - P(x < 50000)$

$$Z = \frac{50000 - 38000}{10000}$$

$$= \frac{12000}{10000}$$

$$= \frac{12}{10}$$

$$= 1.2$$

$$= 0.8849$$

$P(n > 50000) = 1 - 8849$

$= 0.1151$

B) $P(n > 38,500 \ \& \ n < 41,000) =$

$P($

$= P(n < 41,000) - P(n > 38,500)$

$Z \ \text{score} \quad 41000: \quad \frac{41000 - 38000}{10000}$

$P(n < 4107 \quad \frac{3000}{10000} = 0.3 \quad = 0.617$

$P(n > 38500) = \frac{38500 - 38000}{10000} \quad = \frac{500}{10000} = 0.05$

$P(n < 4100) - P(n > 38000) = 0.617 - 0.519$

$= 0.098 //$

c) $\frac{3}{n}$ 30,000   &   50,000

$P(30,000 < n < 50,000)$

$= P(50,000) - P(30,000)$

$= \dfrac{50000 - 38000}{10000} = \dfrac{12000}{1000} = 1.2$

$P(50,000) = 0.1151$ 0.88493

$P(30,000) = \dfrac{30000 - 38000}{10000}$

$= \dfrac{-8000}{10000} = \dfrac{-8}{10} = -0.8$

$P(30,000) = .21186$

$= 0.1151 = 0.21186$

$= 0.88493 - 0.21186$

$= 0.67307$

3) Unbiased die tossed 300 times

4) X follows poisson distribution with parameter 25

5) test consists of 25 MCQs
   Every question has 4 options
   Exactly 5 wrong & Exactly 20 correct

$$n = 25$$

success rate = 0.25 (only 1 choice of 4 choices)

failure = 0.75 (other 3 choices)

$$p(x = 25) = 25C_{20} * ((0.25)^n{}_{20}) * ((0.75)^n{}_5)$$

$$25C_{20} \left(\frac{1}{4}\right)^{20} * \left(\frac{3}{4}\right)^5$$

$$P(6 \text{ wrong}) = 1 - \text{"}$$

6) $$mean = 4$$
   $$\text{man} = 4$$

$$P(x \text{ (on stand)} = 0) = e^{-m} \frac{m^n}{n!}$$

$$= \frac{e^{-4} 4^0}{0!}$$

$$\text{Note } 0! = 1$$

$$= e^{-4}$$

mean = 3

7) (a) $$P(x(1) = 0)$$

$$= \frac{e^{-3} \cancel{3^0}}{0!}$$

$$= e^{-3} // $$

5) Test control 25 mcqs

Every Question has 4 options

Exactly 5 ways = Exactly 20 correct

$n = 5$

Success rate: $\frac{1}{4}$ (only 1 choice should be correct)

failure rate = $\frac{3}{4}$ (other 3 choices)

$P(x = 5) = 25_{C_5} \left(\frac{1}{4}^{\wedge 20}\right) * \left(\frac{3}{4}\right)^{\wedge 20}$

2(b)) $1 - P\left(x_1 + x_2 \leq 2\right)$

$= 1 - \left(P(x_1 + x_2 = 0) + P(x_1 + x_2 = 1)\right)$

Q.1 To determine probability of atmost
2 students out of 5 will get deeph

12. P(getting defect bulb) = 30% = $\frac{30}{100}$ = 0.3

P(not getting defective bulb) = 70% = 0.7

P(two bulbs defective out of 6)

$$= {}^6C_2 * (0.3)^2 * (0.7)^{5-2}$$

$$= \frac{6 \times 5}{2 \times 1} * 0.09 * 0.2401$$

$$= 15 * 0.09 * 0.2401$$

$$= 0.324135$$

$$= 32\%$$