

Q2 (i) :

Stain removed claim =  $p = 70\% = 0.7$ 

$$q = 0.3$$

number of tested garments = 15

$$P(X < 12) = \sum_{n=0}^{11} \binom{15}{n} (0.7)^n (0.3)^{15-n}$$

$$P = 0.703$$

$$P(n=10) = \binom{15}{10} (0.7)^{10} (0.3)^5$$

$$P(n=10) = 0.2063 \quad \text{the claim is not correct}$$

Find mean =  $\mu$  ?

$$\mu = np$$

$$\mu = (15)(0.7)$$

$$\boxed{\mu = 10.5}$$

Find variance =  $\sigma^2$  ?

$$\sigma^2 = npq$$

$$\sigma^2 = (15)(0.7)(0.3)$$

$$\boxed{\sigma^2 = 3.15}$$

Q2 (ii)

$$P(C_1) = 0.2$$

$$P(C_2) = 0.5$$

$$P(C_3) = 0.3$$

$$g_1 = 1$$

$$g_2 = 3$$

$$g_3 = 4$$

$$n = 8$$

$$P(g_1 = 1, g_2 = 3, g_3 = 4) = \frac{n!}{g_1! g_2! g_3!} (C_1)^{g_1} (C_2)^{g_2} (C_3)^{g_3}$$

$$= \frac{8!}{1! 3! 4!} (0.2)^1 (0.5)^3 (0.3)^4$$

$$P = 0.0567$$

Q2 (iii)

~~number~~ number of defective = 28

$$\lambda = 34$$

$$P(28) = \frac{e^{-34} (34)^{28}}{28!}$$

$$P(28) = 0.0427$$

Date 20

$$Q_2(iv) \quad \mu = 65$$

$$\sigma = 8$$

(a) Scored higher than 75

$$P(X > 75) = ?$$

$$Z = \frac{75 - 65}{8}$$

$$Z = 1.25$$

$$P(Z > 1.25) = 1 - P(Z < 1.25)$$

$$P(Z > 1.25) = 1 - 0.8944$$

$$P(Z > 1.25) = 0.1056$$

$$P(Z > 1.25) = 10.56\%$$

(b) Scored between 50 and 85

$$P(50 < X < 85)$$

$$Z_1 = \frac{x - \mu}{\sigma}$$

$$Z_1 = \frac{50 - 65}{8}$$

$$Z_1 = -1.875$$

$$Z_2 = \frac{x_2 - \mu}{\sigma}$$

$$= \frac{85 - 65}{8}$$

$$= 2.50$$



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$$P(-1.87 < Z < 2.50) = P(Z < 2.50) - P(Z < -1.87)$$

$$= 0.9637$$

$$\boxed{P = 96.37\%}$$

(c) Less than 50 and failed

$$P(X < 50)$$

$$Z = \frac{50 - 65}{8} = -1.875$$

$$P(Z < -1.87) = 0.0309$$

$$\cancel{P = 0.30}$$

$$\boxed{P = 3.07\%}$$