$$5.34 \quad E(x) = \begin{bmatrix} -1 & 0.5 + 0.5 + 1 \\ 8 & 4 & 2 & 8 \end{bmatrix}$$

$$\frac{1}{4} - \frac{1}{4} - \frac{1}{2} + \frac{1}{4} = \frac{1}{2} - \frac{1}{4} = \frac{2-1}{4} = \frac{41}{4}$$

$$E(xy) = \frac{2}{8} + \frac{0.5}{4} + \frac{0.5}{2} + \frac{2}{8} = \frac{4}{8} + \frac{0.5}{4} + \frac{1}{2}$$

$$\frac{1}{2} + 0.5 \left(\frac{1+2}{4}\right) = \frac{1}{2} + 0.5 \left(\frac{3}{4}\right)$$

$$E(x^2) = \frac{1}{8} + \frac{0.25}{4} + \frac{0.25}{2} + \frac{1}{8} = 0.4375$$

$$E(4^2) = \frac{4}{8} + \frac{1}{4} + \frac{1}{2} + \frac{24}{8} = 1.75$$

$$V(4) = \mathcal{E}(4^{2}) - (\mathcal{E}(4))^{2}$$

$$= 1.75 - 0.0625 = 1.6875$$

$$7 \text{ Covationic:}$$

$$Cov(x, 4) = \mathcal{E}(x4) - \mathcal{E}(x) \mathcal{E}(4)$$

$$= 0.875 - (0.125)(0.25) = 0.875 - 0.03125$$

$$= 0.84375$$

$$7 \text{ Connelation coefficient:}$$

$$P(xy) = \frac{\text{Cov}(x, 4)}{\sqrt{V(x)V(4)}} = \frac{6x4}{6x64}$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

$$= 0.84375$$

56.42185)(1.6875)

0.84375

= 0.84375 = 1

| | | 6 | | | |
|--|--|---------------|-------------------------------|--|--|
| 5.65 | $\mu = 2$ | V/R)= 0.1 | 3040 3 - N - 1800 | The second secon | |
| | | 14 | 04 +3 | A. | |
| | E(x1)=2 | V(x)) = | 0.1 | | |
| | E(x2)=2 | V (x2) | = 0.1 | | |
| | | ODENIA | | 30 mm | |
| | E(Total) | = E(xi) + E(| X2) | | |
| | | - 2+2=4 | | | |
| | | | - | | |
| 0.87 | * (Total)= | 160x172+ | (6(x2)) = 0.12+0 | .12 | |
| 124 | 8 154 88 | 7 (20.7) | | | |
| | | = [0:01+0:0 | $1 = \int 0.02 =$ | 0.161621 | |
| * | / 0625 | | | J | |
| | | | Uniteres at L | | |
| | n) Menn of | THE TOIME | thickness of th | 10 | |
| | halves | | | | |
| | | | 8 1 - 1 8 | | |
| | Variante | of the 1 | otal thickness | y is | |
| and the second s | (Standard Devia | bon) = 0.14 | 1421. | | |
| | | . / + | (71.) | | |
| and the same of th | b) P (T74.3). | 1-1-6 | (Total) 7 4.3- (Otal) 0.14 | 4 | |
| Commence of the Commence of th | | 0(| (otal) 0.14 | 1421 | |
| The second secon | E 1 10 10 10 10 10 10 10 10 10 10 10 10 1 | | | | |
| | = P(Z) | 2. 12132) = 1 | -P(ZK 2.12132) | | |
| Armony on the product have been been been a particular to the particular to the particular to the particular to | | | - 0.983414 = 0.01 | 6586 | |
| A | | | | | |
| | Millianne state of the state of | | | | |

| 7.7 | µ= 2500 | 63.8 | | | |
|---------------|--|--|--|--|--|
| | 6= 50 | | | | |
| TWO I SECURED | EMPE VON) = 0-1 | | | | |
| 4.1 | n=5 (= 50 | According to the latest the lates | | | |
| | 52500 | | | | |
| | | | | | |
| | $6_{x} = 6 = 50 = 50 = 22.36$ 22.421 $\sqrt{5}$ $\sqrt{5}$ 2.236 | | | | |
| | | | | | |
| | P(2499 < x < 2510) = P(2499 - 2500) < x - 22 | 2500 | | | |
| | 22.421 22 | .621 | | | |
| 1541 | = 100+100 = 0 c2 = 0 cp | | | | |
| | < 2510-2500 | | | | |
| | DIM 15 Aunthor Leich W. 22-42/1017 (0) | 17 | | | |
| | believe is a second | | | | |
| | = P/-1 < Z < 10) = P/-0'0446< | Z | | | |
| . 51 | $= P\left(\frac{-1}{22.421} < \frac{7}{22.421}\right) = P\left(\frac{-0.044}{6} < \frac{6}{22.421}\right)$ | | | | |
| | 150 = (490 of the Co. (446) 12) | | | | |
| | | | | | |
| | = I (0.446) - I (-0.0446) | | | | |
| | MAN O THEND | | | | |
| | = 0.673645 - 0.480061 = 0.193584 × 0.193 | | | | |
| | | | | | |
| | | | | | |

7.36 a) Prove $\hat{P} = \frac{x}{n}$ is an unbiased estimate of p. Assuming an event K indicates kth went as either success(\$1) on failure(0). Me = 1(p) +0(1-p) Potal number of success X is the sum of all the events of Ge. E(X)= M, +M2+...HE+...Mn $E(\hat{p})$ $E(\hat{p}) = \pm E(x) = \pm n cnp = p$ i P = x is an unbiased estimator of

D Vanismite of each event of 18

$$V(G_1) = F(G_1^2) - (F(G_1))^2$$

Assume $F(G_1^2) = I^2(P) + O^2(I-P) = P$
 $V(G_1) = P - P^2 = P(I-P)$

Vanismite of $X = V(G_1) + V(G_2) + V(G_3) + \cdots + V(G_n)$
 $= np(I-P)$

Univer $\hat{P} = \frac{1}{2} = \frac{1}{2} \sqrt{(\hat{P})} = \frac{1}{2} \sqrt{(\hat{P})} = \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{(\hat{P})} = \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{(\hat{P})} = \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{(\hat{P})} = \frac{1}{2} \sqrt{(\hat{P})} + \frac{1}{2} \sqrt{$

E(Ô2) = M + 3M = M

So, both $E(\hat{\theta}_i)$ and $E(\hat{\theta}_2)$ are unbiased estimator of μ .

Vaniance q estimators:

$$V(\hat{\theta}_1) = V\left[\begin{array}{c} x_1 + x_2 \\ 2 \end{array}\right] = \frac{1}{4} 6^2 + \frac{1}{4} 6^2$$

$$=\frac{2}{4}6^{2}=\frac{1}{2}8^{2}$$

$$V(\hat{\theta}_2) = V\left(\frac{x_1 + 3x_2}{\varphi}\right) = \frac{1}{16} \frac{6^2 + 9}{16} 6^2$$

$$\frac{10^{6}}{16} = \frac{5}{8} + \frac{5}{8}$$

$$V(\hat{\theta}_1) = \frac{1}{2} \delta^2$$
, $V(\hat{\theta}_2) = \frac{5}{8} \delta^2$