6.3.1.(1)$EX_1=0(1-p)+1p=p$, 故X_1是p的无偏估计

(2)$EX_1^2=0^2(1-p)+1^2p=p\neq p^2$, 故$X_1^2$不是$p$的无偏估计

(3)$EX_1X_2=0^2(1-p)^2+1(1-p)p0+1(1-p)p0+1^2p^2=p^2$, 故$X_1X_2$是$p^2$的无偏估计

6.3.3.$EX=VarX=\lambda$

$EX^2=(EX)^2+VarX=EX+\lambda^2$

即为$E(X^2)-E(X)=\lambda^2$

即$\lambda^2=\overline{X}^2-\frac{\overline{X}}{n}$

6.3.5.由题意得, $k_1+k_2=1$

$Var(k_1\hat{\theta}_1+k_2\hat{\theta}_2)=k_1^2Var\hat{\theta}_1+k_2^2Var\hat{\theta}_2=2k_1^2Var\hat{\theta}_2+(1-k_1)^2Var\hat{\theta}_2$

$=(3k_1^2-2k_1+1)Var\hat{\theta}_2$

由二次函数性质得$k_1=\frac{1}{3}$, 故$k_2=\frac{2}{3}$

6.3.6.$MSE(\hat{\theta}_1)=6, MSE(\hat{\theta}_2)=1^2+2=3$

因此$\hat{\theta}_2$比较好

6.4.2.保证枢轴量的分布已知且不依赖于任何未知参数

6.5.2.由公式得，σ^2未知, μ置信水平为0.95的置信区间为

$[2.705-\frac{0.029}{\sqrt{16}}t_{0.975}(15), 2.705=\frac{0.029}{\sqrt{16}}t_{0.975}(15)]$

即为[2.6895, 2.7205]

6.5.4.由公式得，σ^2未知, μ置信水平为0.95的置信区间为

$[6720-\frac{220}{\sqrt{10}}t_{0.975}(9), 6720+\frac{220}{\sqrt{10}}t_{0.975}(9)]$

即为[6562.618, 6877.382]

6.5.6.由公式得, μ未知，σ置信水平为0.95的置信区间为

$[\sqrt{\frac{(9-1)11^2}{\chi^2_{0.975}(8)}}, \sqrt{\frac{(9-1)11^2}{\chi^2_{0.025}(8)}}]$

即为[7.4300, 21.0736]

6.5.7.$\overline{x}=2.8, s=0.223$

由公式得，对于期望值和方差分别作置信水平为0.95的区间估计结果如下

$[2.8-\frac{0.223}{\sqrt{15}}t_{0.975}(14), 2.8+\frac{0.223}{\sqrt{15}}t_{0.975}(14)], [\frac{14\times0.223^2}{\chi^2_{0.975}(14)}, \frac{14\times0.223^2}{\chi^2_{0.025}(14)}]$

即为[2.6762, 2.9238], [0.0268, 0.1244]

6.6.3.由如下公式$[\overline{X}-\overline{Y}-t_{1-\frac{\alpha}{2}}(m+n-2)S_W\sqrt{\frac{1}{m}+\frac{1}{n}},\overline{X}-\overline{Y}+t_{1-\frac{\alpha}{2}}(m+n-2)S_W\sqrt{\frac{1}{m}+\frac{1}{n}}]$
可得平均参数之差的置信区间为$[-2.245,-1.855]$

6.6.4.由公式得$[\frac{0.245^2/0.357^2}{F_{0.975}(5,5)},\frac{0.245^2/0.357^2}{F_{0.025}(5,5)}]$
即$[0.0659,3.3675]$