Class Test-04

1. Let $\boldsymbol{X}$ equal the daily sell of foods in kg by the super shops. Suppose the variance of $\boldsymbol{X}$ is $\mathbf{225}$ kg. To estimate the mean $\boldsymbol{\mu}$ of $\boldsymbol{X}$, an agency took a random sample of $\mathbf{25}$ super shops and found they sold in a total of $\mathbf{2000}$ kg of foods in a day. Find an approximate confidence interval for $\boldsymbol{\mu}$ with $\mathbf{20}$% significance. **[3]**

2. A company produces electric bulbs whose average life time is **185** days and variance **75** days. It is claimed that, in a newly developed process the mean life time can be increased.
   (a) Design a decision rule for the process at the **0.01** significance to test **80** bulbs. **[2.5]**
   (b) If the new process has increase the mean life time to **190** days. Find $\boldsymbol{\alpha}$ and $\boldsymbol{\beta}$ for the estimated mean **188** days for **65** samples. **[3]**
   (c) If the estimated average life time for **40** samples is **189** days, find the ***p*-value** of the claim of the manufacturer. **[1.5]**