1. 

2. Webster 1.6

Mean \( \bar{x} = \frac{\sum X_i}{n} = \frac{15}{5} = 3.00 \)

S.D. \( \sigma = \sqrt{\frac{\sum (X_i-\bar{x})^2}{n-1}} = \sqrt{\frac{4+4+0+4+4}{4}} = \sqrt{8} = 2.83 \)

Webster 1.2

90% sensitivity
80% specificity

5 people have disease
60 people do not

\( TP + FN = 5 \quad TN + FP = 60 \)

\( 0.9 = \frac{TP}{TP+FN} = \frac{TP}{5} \Rightarrow TP = 4.5 \) (since people not divisible)

\( TP + FN = 5 \Rightarrow FN = 0.5 \) (pick 0 or 1)

\( 0.8 = \frac{TN}{TN+FP} = \frac{TN}{60} \Rightarrow TN = 48 \)

\( TN + FP = 60 \Rightarrow FP = 12 \)
3. Truth temp = 60.0°F
   Average relative accuracy
   \[ \frac{1}{N} \sum_{i=1}^{N} |x_i - x_{mi}| = \frac{1}{6}(0.5+0.2+0.7+0.1+0.0+0.5) \]
   \[ = \frac{2}{6} = 0.33°F \]

4. Invasiveness level is penetrating, by our definition.
   (commonly called "minimally invasive" in practice)

5. Lack of proven benefit to patient
   - High cost
   - Low reliability
   - Difficult to use
   - Insufficient resources to pass regulatory hurdles
   - Not compatible with existing equipment