

CRITICAL THINKING

1. Describe the difference(s) between symptom, first level and higher level causes as they apply to problem solving. (6 pts)

Symptoms - not actual causes but signs of existing problems

First level - causes that lead directly to the problem

Higher level - causes that lead directly to the first level causes

2. Critical thinking involves the several skills describe/define the following
- Open-mindedness **receptive to new ideas**
 - Confidence in reasoning **reasons for confidence, ask others ?, self-evaluation**
 - Inquisitiveness **ask questions**
3. FMECA (failure mode effect and criticality analysis) is a problem prevention tool. There are three general phases to the analysis, describe each (6 pts)
- Identify
 - Analyze
 - Act

Phase	Question	Output
Identify	What can go wrong?	Failure descriptions Causes Failure Modes Effects
Analyze	How likely is a failure? What are the consequences?	Failure rates RPN (risk priority number)
Act	What can be done? How can we eliminate the causes? How can we reduce the severity	Design solutions Test plans Manufacturing changes Error proofing Etc.