Quality Management and Metrology (MEC-E1090)

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Question 1.

ISO 9001 Standard **PDCA-cycle**.

Question 2.

Given the following **GRR analysis** report:

(a) what is the **PT** ratio?
(b) what the **%RR**?
(c) Are they acceptable?
(d) What ought to be improved to increase **precision**?
(e) Can you use the gage to measure parts for **specification compliance**? Why or why not?
(g) Can you use the gage to measure parts for **statistical process control**? Why or why not?

Gage R&R

Source	VarComp	% Contribution (of VarComp)
Total Gage R&R	0.6306	0.89
Repeatability	0.0833	0.12
Reproducibility	0.5472	0.78
Operator	0.4917	0.70
Operator*Part	0.0556	0.08
Part-To-Part	69.8886	99.11
Total Variation	70.5192	100.00

Source	StdDev (SD)	Study Var (6* SD)	%Study Var (%SV)	% Tolerance (SV/Tol)
Total Gage R&R	0.794075	4.76445	9.46	39.70
Repeatability	0.288675	1.73205	3.44	14.43
Reproducibility	0.739745	4.43847	8.81	36.99
Operator	0.701189	4.20714	8.35	35.06
Operator*Part	0.235702	1.41421	2.81	11.79
Part-To-Part	8.359943	50.15966	99.55	418.00
Total Variation	8.397571	50.38543	100.00	419.88

Question 3.

Gauge Blocks; calibration of the blocks and calibration with the blocks

Question 4.

Suppose supplier A has provided a sample of 20 parts which upon inspection show a **Cp of 1.21** and a **Cpk of 1.15.** Another Supplier B has provided a sample of 20 parts with upon inspection show a **Cp of 1.62** and a **Cpk of 0.91.**

Which supplier would you rather work with and why?

Question 5.

How are **Corrective Actions** and **Preventive Actions** different and why do you need to do **Root Cause Analysis** for managing **Continuous Improvement**?

Question 6.

What are **Xbar** and **R charts** and how useful they are:

1. When your product quality levels have a **Cp = 0.8** and **Cpk = 0.7**?
2. When your product quality levels have a **Cp = 1.5** and **Cpk = 1.2**?