

Indian Statistical Institute, Bangalore
MS (QMS) First Year
Second Semester - Advanced Statistical Process Control

Final Exam
Maximum marks: 50

Date: May 11, 2022
Duration: 3 hours

1. [2 + 8 = 10]

a) Define the method of item-by-item sequential sampling plan.

b) Derive the first 3 plans of an item-by-item sequential sampling plan satisfying

$$P_1 = 0.01, \alpha = 0.05, P_2 = 0.09, \beta = 0.10$$

2. [3 + 5 + 2 + 10 = 20]

a) Define the concept and implementation steps of Taguchi's β -correction technique.

b) Derive the formula of β .

c) State the range when process correction is not required.

d) Compute the β -correction table from the continuous 16 observation for 5 different observation of mean which require correction.

25, 20, 20, 20, 25, 25, 27, 25, 25, 22, 29, 26, 25, 29, 28, 30

3. [2 + 4 = 6]

a) When to apply chain sampling plan.

b) Draw the OC curve of the chain sampling plan for $n=6$, $i=4$ and report the AQL and AOQL values.

4. [2 + 6 = 8]

a) Define CSP I, II and III plans.

b) Calculate the value of AQL and AOQL for the CSP I plan $AOQ(\%) = 0.018$, $f = \frac{1}{2}$, $i = 1540$

5. Write short notes on the following:- [3 x 5 = 15]

a) Acceptance Rejection v/s Rectification Sampling plan

b) Taguchi's concept of Loss Function.

c) Process Correction v/s Process Adjustment

d) Which sampling plan protects customer more (with justification)

$n = 20$, $c = 2$, v/s $n = 100$, $c = 3$

e) How to verify effectiveness of sampling inspection?