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

Final Exam — Date: April 21, 2025
Maximum marks: 60 — Duration: 3 hours

1. [4 + 8 = 12]

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

b) Derive first 3 plans by using
$$P_1 = 0.02, \propto = 0.05, P_2 = 0.12, \beta = 0.10$$
State the stopping rule of sequential inspection.

2. [4 + 10 = 14]

a) State the difference between zero acceptance number (zero defect plan) and a chain sampling plan.

b) Compare both the plans and state when to use which plan.

$n = 5, i = 2$ (Chain sampling) $\quad n = 5, c = 0$ (Zero defect plan)

3. [3 + 5 + 12 + 2 = 22]

a) Define the method of implementation of Taguchi's β-correction procedure for process correction.

b) Arrive at the β-correction factor for a continuous characteristic.

c) Calculate the value of β from the following data ($\propto = 0.05$)

95 100 105 105 110 108 112 115 118 112 120 116 120 122 118 119

The target value is 110. Fine the amount of connection when average is 120, 125, 85.

d) State the difference between process control v/s process adjustment.

4. [3 + 5 + 2 = 10]

a) Define the method of CSP1, CSP2 and CSP3 plans.

b) Calculate AQL, LTPD value for the CSP1 plan $i = 50, f = \frac{1}{5}$.

c) State when this method of inspection does not benefit the industry.

5. [4 + 4 = 8]

a) State the concept of Taguchi's loss function for various type of characteristics.

b) State the method by which one can find out if the followed sampling plan is protecting the customer.