

U.G. 5th Semester Examination - 2021**STATISTICS****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : STAH-DSE-T-1****(Statistical Quality Control)**

Full Marks : 50(40+10)

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable. Notations and symbols have their usual meaning.*

1. Answer any **five** questions: 2×5=10
 - a) What is the rationale of Shewhart's control charts?
 - b) Why is product control important?
 - c) Define OC curve of a sampling plan.
 - d) Distinguish between defects and defectives.
 - e) What are rational subgroups?
 - f) What is sampling inspection plan?
 - g) Explain the meaning of LTPD.
 - h) What is average total inspection?
2. Answer any **two** questions: 5×2=10
 - a) Explain clearly chance causes and assignable causes of variation in process control.

- b) While preparing the control chart for process mean, how one can estimate the process standard deviation if it is unknown? State whether the estimate is valid when the underlying distribution is not normal.
- c) How can you determine a single sampling inspection plan when the consumer risk and LTPD are specified?
- d) Write a note on ISO quality standard.

3. Answer any **two** questions: 10×2=20

- a) Develop control limits on p-chart for equal sample sizes. State the problem when sample sizes vary. Give a method to judge the nature of the state of the process in this case. 10
- b) Derive the control limits for a manufacturing process where each item is observed for the number of defects it contains. How do you take care of the situation when the subgroup sizes are not equal? 5+5
- c) Describe an acceptance-rectification type single sampling inspection plan for attribute. Give an outline of the average outgoing quality-based method for determining the plan parameters involved in the single sampling inspection plan. 5+5

[Turn over]

- d) Describe double sampling inspection plans. Give an outline of methods for determining the constants involved in double sampling plan.

4+6

[Internal Assessment: 10]
