

2021

STATISTICS — HONOURS — PRACTICAL

Paper : DSE-A-1P

(Statistical Quality Control)

Full Marks : 30

The figures in the margin indicate full marks.

1. A paper mill uses a control chart to monitor the imperfection in finished rolls of paper. Production output is inspected for 20 days, and the resulting data are shown below. Use these data to set up a control chart for non-conformities per roll of paper. Does the process appear to be in statistical control? What would be the OC function and ARL for this process? 15

Day	Number of Rolls Produced	Total Number of imperfections	Day	Number of Rolls Produced	Total Number of imperfections
1	18	12	11	18	4
2	18	14	12	18	14
3	24	20	13	18	9
4	22	18	14	20	10
5	22	15	15	20	14
6	22	12	16	20	13
7	20	11	17	24	16
8	20	15	18	24	18
9	20	12	19	22	20
10	20	10	20	21	17

2. Determine the OC and ASN functions of the following two sampling plans and discuss their relative merits. (The lot sizes may be supposed to be large) 15

Sampling plan I. Draw a sample of size 5. If the number of defectives is less than equal to 1 accept the lot and if it is greater than equal to 2 reject the lot.

Sampling plan II. Draw a sample of size 3. If no defective is found accept the lot, if two or more defectives are found reject the lot otherwise draw a second sample of size 6. If the number of defectives in the combined sample is less than equal to 1 accept the lot and if it is greater than equal to 2 reject the lot.