

B. Sc Semester- V , Examination, Dec. 2020
STAT -CC- 504 | Sampling Techniques and SQC|

Duration: 1:30 Minutes

Marks : 42

Instructions:

1. There are FOUR Questions in this paper. Attempt ANY THREE
2. Each question carries 14 marks.
3. Use of scientific calculator is allowed.

Q-1 Explain the construction of 3- σ control limits for the control chart for mean (\bar{X}) and range (R), when standards are i) known and ii) unknown and Give distinguish between - Process control and Product control. 14

OR

Q-1A₁ Give the difference between - 7
 i) Variable Control Charts and Attribute Control Charts.
 ii) Chance cause and assignable causes,

Q-1A₂ Sample of sub-groups of 5 items each were taken in the measurement of an important dimension of a manufactured part. The mean of the 25 sub-groups was 0.6000 inches and the sum of the ranges of the sub groups was 0.5 inches .Find the upper and lower control limits for \bar{X} and R charts 7

Q-2 What is a Fraction Defective? Which control chart is drawn for fraction defective? Give its 3- σ control limits. And solve the following problem: 14
 In 10 pieces of cotton cloth with equal size, during the examination the following number of defect are observed-

2, 3, 4, 0, 5, 6, 7, 4, 3, 2

Draw an appropriate control chart and comment on the state of control.

OR

Q-2A₁ Describe the scheme of single sampling plan in Acceptance Sampling. 7

Q-2A₂ For a SSP (1200, 100, 2), Using Poisson probability distribution, if AQL and LTPD are 0.05 and 0.1 respectively, find Producer's Risk and Consumer's Risk. 7

Q-3 Define simple random sampling (i) with replacement and (ii) without replacement from a finite population, derive an unbiased estimates of the population mean. and prove that (in usual notation) 14

$$V(\bar{y}) = \frac{S^2}{n} \left(\frac{N-n}{N} \right)$$

OR

Q-3A₁ In a r.s. of 60 students taken from a population of 3000 students 36 students had Apple mobile Phones .Obtain the estimate of total no. of students having mobile phones and estimate the S.E. of the estimator you used. 7

નોંધ:

- પ્રશ્નપત્રનો સમય ૧.૩૦ કલાકનો રહેશે.
- પ્રશ્નપત્રમાં ૪ પ્રશ્નોમાંથી કોઈ પણ ત્રણ પ્રશ્નોના જવાબ આપવાનો રહેશે.
- દરેક પ્રશ્નના ગુણ એકસરખા (૧૪ માર્ક્સના) રહેશે. પ્રશ્નપત્ર કુલ ૪૨ માર્ક્સ નું રહેશે.

