B. Sc. Semester VI
ST – 604 [Statistical Quality Control]
April -2016

Time :- $2\frac{1}{2}$ Hours   Marks : 70

Instructions:-   1) There are five compulsory questions in this Q. Paper.
                 2) All question carry equal marks.
                 3) Statistical Tables will be provided on request.

Q-1 (a) Why we construct 3-σ control limits in the study of control chart   6
          theory.

     (b) Distinguish between- chance cause and assignable cause of   8
          variations in SQC.

OR

Q-1 (a) Describe 3-σ control limits for the $\bar{X}$ - charts.   7

     (b) Control charts for $\bar{X}$ and R are maintained on the tensile strength   7
          in pounds of a certain yarn. The sub-group size is 5. The values of
          $\bar{X}$ and R are computed for each sub-group. After 25 sub-groups,
          $\Sigma \bar{X} = 514.8$ and $\Sigma R = 120.0$.Compute the values of 3- sigma control
          limits for $\bar{X}$ and R- charts and estimate value of σ on the
          assumption that process is in statistical control.

Q-2 (a) Distinguish between defective item and a defect in an item. How   6
          does p chart differ from d chart.

     (b) Sample each of 250 radios are inspected for 12 days .The number   8
          of defective radios found in different samples are given below
          prepare np-chart and give your conclusion.

Sample	1	2	3	4	5	6	7	8	9	10	11	12
No. of defective	39	32	35	22	45	40	25	47	23	30	24	34

OR

Q-2 (a) What is a Fraction Defective? Give its construction of 3-σ control   8
          limits and interpretations p- chart?

     (b) Write a note on, 'Process Capability Analysis'   6

Q-3 (a) Explain the construction of C- chart. Give its applications.   8

     (b) Write a note on - Theory of runs in control chart   6

OR

Q-3 (a) What is acceptance sampling? Explain its importance.   6

(b) Write a note on, i) Producer's Risk and 8
ii) Consumer's Risk in Acceptance Sampling.

Q-4 (a) Explain the scheme of a single sampling plan. 6

(b) Explain in brief, the following terms – 8
  i. AQL
  ii. LTPD
  iii. AOQL
  iv. ATI

OR

Q-4 (a) Explain the construction of " OC – curve, AOQ curve and ATI – 8 curve" for Single Acceptance Sampling Plan.

(b) For a SSP(1000,100,1),AQL and LTPD are 0.01 and 0.06 6 respectively. Find producer's risk and consumer risk.

Q-5 (a) Explain double sampling plan. 7

(b) Explain the following double sampling plan: 7
DSP(4000,100,2,300,3)

OR

Q-5 (a) In a DSP (1000,30,0,60,1) and the lot contains 2% defectives 9 units. Find the probability of accepting lot.

(b) Write the advantages of double sampling plan. 5