Oct-2015 Code:4628

B. Sc.Semester VI

ST – 604 [Statistical Quality Control]

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) Explain 3-σ control limits in the study of control chart theory. 8

(b) Distinguish between- chance variations and assignable variations in SQC. 6

OR

Q-1 (a) Describe 3-σ control limits for the np- charts. 7

(b) Control Chart for $\overline{X}$ and σ are maintained on the breaking strength in pounds in a certain destructive test of a particular type of ceramic insulator used in vacuum tubes. The sub-group size is 15.The value of $\overline{X}$ and σ are computed for each sub-group. After 12 sub-groups, $\Sigma\overline{X}$=1307 and Σ σ =191.5. Compute 3σ limits for $\overline{X}$ and σ charts and estimate the value of process dispersion σ' on the assumption that the process is in statistical control. 7

Q-2 (a) The following table gives the number of defects noted at the final inspection of some Aircrafts .Plot a control chart for C and comment on the state of control. Suggest an estimate of " C". 8

Aircraft No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No. of defects	7	15	13	18	10	14	7	10	20	11	22	15	8	24	14	8

(b) Distinguish between defective item and a defect in an item. How does p chart differ from np chart. 6

OR

Q-2 (a) What is a number of Defective? Give its construction of 3-σ control limits and interpretations? 6

(b) In 10 pieces of cotton cloth with equal size the number of defects observed are 8

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

Draw a control chart for number of defects and comment on the state of control.

Q-3 (a) Distinguish between, 'Control chart for variable and control chart for attributes. 6

	(b)	Write a note on - i) Theory of runs in control chart ii) Process control and product control	8
		OR	
Q-3	(a)	What is acceptance sampling? Explain its importance in statistical quality control.	8
	(b)	Write a note on, i) Producer's Risk and ii) Consumer's Risk in Acceptance Sampling.	6
Q-4	(a)	Define single sampling plan. State its importance in acceptance sampling.	6
	(b)	Explain the construction of " OC – curve, AOQ curve and ATI – curve" for Single Acceptance Sampling Plan.	8
		OR	
Q-4	(a)	For a SSP(2000,100,1),AQL and LTPD are 0.02 and 0.08 respectively. Find producer's risk and consumer risk.	6
	(b)	Explain in brief, the following terms – i. LTPD iii.AOQL ii. AQL iv. ATI	8
Q-5	(a)	Explain double sampling plan.	7
	(b)	Explain the following double sampling plan: DSP (1000,30,0,60,2)	7
		OR	
Q-5	(a)	For the DSP (2000,50,0,100,2) with fraction defectives p =0.005. Compute probability of acceptance of lot.	9
	(b)	Distinguish between single sampling plan and double sampling plan.	5