Seat No. : _____

TB-118

April-2013

M.Sc. Sem. IV

509 STATISTICS

(Industrial Statistics)

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) Attempt all questions.
(2) **All** questions carry equal marks.

1. (a) Explain :
   (i) Prevention costs
   (ii) Internal failure costs

   OR

   Distinguish between Shewhart control chart and CUSUM control chart.

   (b) Discuss Johnson's method for designing the V-mask.

   OR

   Explain the moving average control chart and compare it with Shewhart chart.

2. (a) Explain how process capability analysis is helpful in quality improvement program.

   OR

   Explain the cumulative sum control chart for monitoring process variability.

   (b) Explain the control limits for the EWMA control chart.

   OR

   Discuss confidence intervals on process capability ratios.

3. (a) Explain ChSP-1 plan. Discuss OC curve related to this plan.

   OR

   Explain SkSP-1 and SkSP-2 plans.

   (b) Explain the role of normality in determining defective parts per million.

   OR

   Explain CSP-1 plan. Discuss AOQL related to this plan.

4. (a) Explain how statistical process control methods and experimental design are interrelated for the improvement and optimization of process.

OR

Explain with an example how design of experiment is helpful in characterizing a process.

(b) Explain 2^{k-p} fractional factorial design.

OR

Explain Taguchi's philosophy.

5. Answer the following :

(i) Quality is inversely proportional to variability.

(a) True (b) False

(ii) Quality means fitness for use.

(a) True (b) False

(iii) In tabular cusum K is usually called _____.

(iv) The moving – average control chart is less effective than the Shewhart chart in detecting small process shifts.

(a) True (b) False

(v) EWMA control chart is less effective in detecting small shifts.

(a) True (b) False

(vi) PCR = _____.

(vii) Experimental design is a passive statistical method.

(a) True (b) False

(viii) A $\frac{1}{16}$ fraction is called a 2^{k-4} fractional factorial design.

(a) True (b) False

(ix) Chain sampling plans make use of the cumulative results of several preceeding plots.

(a) True (b) False

(x) What do you mean by noise factors ?

(xi) When there are several factors of interest in an experiment, a _____ design should be used.

(xii) What do you mean by clearance number ?

(xiii) Skip-lot sampling plans should be used only when the quality of the submitted product is good as demonstrated by the vendor's quality history.

(a) True (b) False

(xiv) Continuous – sampling plans are rectifying inspection plans, in that the quality of the product is improved by the partial screening.

(a) True (b) False

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