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1504E204

Candidate's Seat No :_____

M.Sc. Sem.-4 Examination

509

Statistics

April-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Note: Attempt all questions.

Q.1

(i) What do you understand by statistical quality control? Discuss the causes of variation in quality. [7]

(ii) Explain natural tolerance limits and specification limits. [7]

OR

(i) Discuss various components or dimensions of quality. [7]

(ii) What are different types of costs? Explain any one. [7]

Q.2

(i) Explain the tabular cusum for monitoring the process mean. [7]

(ii) Explain the moving average control chart and compare it with other control charts. [7]

OR

(i) Explain the exponentially weighted moving-average control chart. [7]

(ii) Explain the cumulative sum control chart for monitoring process variability. [7]

Q.3

(i) Explain ChSP-1 plan. Discuss OC curve related to this plan. [7]

(ii) Expain CSP-1 plan. [7]

OR

(i) What do you understand by process capability analysis? Discuss its applications. [7]

(ii) Discuss Skip-lot sampling plans. [7]

Q.4

(i) Explain how statistical process control methods and experimental design are interrelated for the improvement and optimization of process. [7]

(ii) Explain Taguchi's philosophy about quality engineering. [7]

OR

(i) Explain 2^{k-p} fractional factorial design with an example. [7]

(ii) Explain with an example how design of experiment is helpful in characterizing a process. [7]

(P.T.O)

E204-2

Q. 5 Answer any seven: [14]

(i) Define Quality.

(ii) The cost of scrap rework, in a product quality cost system is categorized as a_____costs.

(iii) Quality characteristics are classified into variables and _____.
(a) constants (b) attributes (c) standard (d) specifications

(iv) Give one advantage of cusum chart.

(v) Which of these is a correct statement for cusum status charts?

(a) A plot between the C_i^+ or C_i^- and the sample number
(b) A plot between the C_i^+ or C_i^- and the sample mean
(c) A plot between the C_i^+ or C_i^- and the sample variance
(d) A plot between the C_i^+ or C_i^- and the sample standard deviation

(vi) In tabulr cusum H is = ----------.

(vii) Define PCR.

(viii) Define PCR_k.

(ix) PCR_{km} is given by

(a) $\frac{LSL - USL}{6}$ (b) $\frac{USL - LSL}{\tau}$ (c) $\frac{USL - LSL}{6\tau}$ (d) none of the above

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

(xi) Which of these quality gurus introduced the concept of robust design?
(a) Feigenbaum (b) Ishikawa (c) Juran (d) Taguchi

(xii) What do you mean by 'interaction' in factorial design?

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