G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.
(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., STATISTICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
V	PART - III	CORE	U21ST508	STATISTICAL QUALITY CONTROL

Date & Session: 08.11.2024 / FN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	What is the primary cause of quality variation in manufacturing processes? a) Assignable causes b) Chance causes c) Environmental causes d) Operational causes
CO1	K2	2.	What is the primary purpose of using a Shewhart control chart in quality control? a) To reduce production cost b) To identify variations due to assignable causes c) Non To eliminate all variations in the process d) To increase customer satisfaction
CO2	K1	3.	When interpreting an X-bar chart, points outside the control limits suggest_____. a) The process is stable b) Special causes of variation are present c) The process mean is acceptable d) Variability is too low
CO2	K2	4.	Trial control limits are determined by_____. a) Calculating from historical process data b) Setting arbitrary values c) Taking customer feedback d) Using external benchmarking standards
CO3	K1	5.	Attribute control charts are primarily used to monitor? a) Continuous data b) The number or proportion of defects c) The process mean d) Machine performance
CO3	K2	6.	The choice between using a p-chart and an np-chart depends on_____. a) The production shift pattern b) The type of defects being measured c) The time period of sampling d) Whether the sample size is fixed or variable
CO4	K1	7.	Producer's risk (α) is_____. a) Sampling too much b) Accepting bad c) Rejecting good d) Sampling too little
CO4	K2	8.	The OC curve represents_____. a) Acceptance probability b) Sample size c) Defects per unit d) Inspection time
CO5	K1	9.	Basic elements of reliability include is? a) Performance b) Safety c) Cost d) Durability

CO5	K2	10.	In a Markov model, system availability is determined by_____. a) Repair time b) Failure rate c) Design specs d) Maintenance checks
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	What are Chance causes and Assignable causes of variation? **(OR)**
CO1	K3	11b.	Write needs for statistical quality control techniques in industry.
CO2	K3	12a.	Elucidates control chart for variables. **(OR)**
CO2	K3	12b.	Write short notes about interpretation of control chart R.
CO3	K4	13a.	Determine control chart for attributes. **(OR)**
CO3	K4	13b.	Discuss about the construction of C chart.
CO4	K4	14a.	Explain producer risk and consumer risk. **(OR)**
CO4	K4	14b.	Elucidate single sampling plan procedures with flow chart.
CO5	K5	15a.	Explain the basic elements of reliability. **(OR)**
CO5	K5	15b.	Define quality control and reliability.

Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Describe the uses of Shewhart control charts and explain the steps to construct one. **(OR)**
CO1	K3	16b.	Briefly explain about the following. i) Specification limits ii) Tolerance limits
CO2	K4	17a.	Write purpose of $\bar{X}$, R and σ chartsin the context of statistical process control. **(OR)**
CO2	K4	17b.	Discuss how to interpret $\bar{X}$ and R charts to determine if a process is in control.
CO3	K4	18a.	Define the p-chart and np-chart, and describe their primary use in quality control. **(OR)**
CO3	K4	18b.	Describe the steps involved in constructing a p-chart.
CO4	K5	19a.	Explain the concept of a double sampling plan and give flow chart. **(OR)**
CO4	K5	19b.	Describe the associated performance measures of a sampling plan, such as the Operating Characteristic (OC) curve, Average Outgoing Quality (AOQ), and Average Total Inspection (ATI).
CO5	K5	20a.	Define quality control and reliability, explain their importance in manufacturing and service industries. **(OR)**
CO5	K5	20b.	Describe the process of Failure Mode, Effects, and Criticality Analysis (FMECA) and its role in improving reliability.