A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 99729

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Elective

Mechanical Engineering

19UME929– STATISTICAL QUALITY CONTROL

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The dimension of quality is CO1- U

   (a) Hazard Rate (b) Process Capability (c) Control Limits (d) Performance

2. Deming endorsed and promoted the following one CO1- U

   (a) The Malcolm Baldrige National Quality award. (b) Total Quality Management

   (c) ISO 9000 (d) SPC techniques.

3. Identify the median of the call received on 7 consecutive days 11,13, 17, 13, 23,25,19 CO2- U

   (a) 13 (b) 23 (c) 25 (d) 17

4. Identify the chart to found special cause variation within your process: CO2- U

   (a) Pareto Chart (b) Gantt Chart (c) Control Chart (d) Flow Diagram

5. The Acme Brick company measures the weight of bricks coming off the production line. 15 bricks are measured per sub-group. Which of the following control charts is most appropriate? CO3- U

   (a) X bar and R chart (b) X bar and S chart (c) P chart (d) C chart

6. Which of the following control charts is most sensitive to changes in the process: CO3- U

   (a) I-MR Chart (b) P Chart (c) C Chart (d) X-bar and R Chart

7. In a P chart large sample size is generally CO4- U

(a) Economical (b) Advisable (c) Un economical (d) None of the above

8. The control charts for number of defects per unit is CO4- U

(a) X bar chart (b) U chart (c) np chart (d) C chart

9. The success of sampling inspection depends upon: CO4- U

(a) Sample size (b) Lot size (c) Acceptance number (d) All of the above

10 In any sampling plan if "C" is the acceptance number then the rejection number is: CO4- U

(a) 1-C (b) C+1 (c) C-1 (d) C^2

PART – B (5 x 2= 10 Marks)

11 Explain Statistical Quality Control. CO1- U

12 Classify process control and product control CO2- U

13 Summarize the objectives of X bar and R charts. CO3- U

14 Classify the control charts for attributes and control charts for variables. CO4- U

15 Demonstrate a typical application of Acceptance Sampling CO5- U

PART – C (5 x 16= 80 Marks)

16 (a) Apply the basic principles of control charts in a process control unit. CO1-App (16)

Or

(b) Identify the difference between the Chance causes and Assignable causes of variation with suitable examples. CO1-App (16)

17 (a) Develop the "Magnificent seven" tools used in SPC. CO3-App (16)

Or

(b) Organize and explain how variation is described through the frequency distribution and histogram. CO3-App (16)

18 (a) Build the construction procedure of X bar – R chart. Give a model data sheet of an X bar-R chart. CO3-App (16)

Or

(b) Identify and explain how appropriate control charts are selected for variables with suitable examples. CO3-App (16)

19	(a)	Identify and explain the construction procedure for attribute charts with examples.	CO5-App	(16)
		Or		
	(b)	(i) Identify and explain the probability distribution used for C charts	CO5-App	(8)
		(ii) Identify and list the limitations of control charts for variables over control charts for attributes.	CO5-App	(8)
20	(a)	Choose and clarify acceptance sampling and mention the situations it is most likely to be useful and list out its advantages.	CO6-App	(16)
		Or		
	(b)	Construct the procedure adopted in Dodge's AOQL plan for continuous production. (CSP-1, CSP-2 and CSP-3)	CO6-App	(16)