



**HDV-003-1173002** Seat No. \_\_\_\_\_

**M. Sc. (Statistics) (Sem. III) (CBCS) Examination**

**November / December – 2017**

**MS - 302 : Industrial Statistics**

**Faculty Code : 003**

**Subject Code : 1173002**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) Attempt all questions.  
(2) Each question carries equal marks.

**1** Answer the following : (Any **Seven**) **14**

- (1) What is the lower control limit for EWMA chart?
- (2) Write down the all control limits for R charts.
- (3) Which chart is widely used in non manufacturing quality improvement methods.
- (4) Pareto chart are often used in both the measure and Analyze steps of \_\_\_\_\_
- (5) Write Control limits for the  $\bar{X}$  bar chart.
- (6)  $\bar{X}$  and R charts is known as chart for \_\_\_\_\_
- (7) Chart for fraction is define as \_\_\_\_\_
- (8) OC curve means \_\_\_\_\_
- (9) Upper control limit for P chart is \_\_\_\_\_
- (10) Control chart or defects is known as \_\_\_\_\_ chart.

**2** Answer the following : (Any **Two**) **14**

- (1) Explain Cause and effect diagram.
- (2) Explain  $\bar{X}$  and R chart.
- (3) Explain Pareto chart in statistical quality control.

- 3** Answer the following : **14**
- (1) Explain defect concentration diagram.
  - (2) Explain choice between attributes and variable control charts.

**OR**

- 3** Answer the following : **14**
- (1) Explain Dodge - Romig Sampling plans.
  - (2) Explain control charts for fraction, non - conforming.

- 4** Answer the following : (Any **Two**) **14**
- (1) Explain V - mask procedure for CUSUM Chart.
  - (2) Explain the sample mean vector and covariance matrix of the multivariate Normal Distribution.
  - (3) Find U - Chart for data on no. of shipping errors in a supply chain network with sample size  $n = 50$ .

<i>Sample no.</i> (Week)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>Non conformities</i>	2	3	8	1	1	4	1	4	5	1	8	2	4	3	4	1	8	3	7	4

- 5** Answer the following : (Any **Two**) **14**
- (1) Explain the exponentially weighted moving average control chart for monitoring the process mean.
  - (2) Explain Average Outgoing Quality.
  - (3) Explain Acceptance sampling problem.
  - (4) Explain types of sampling plans.

---