# Quick Questions 17 Statistical Quality Control

I. Place the number of the appropriate formula, expression, or term next to the concept it describes.

A. A control chart 5

B. Assignable variation 3

C. Random variation 4

D. An $\bar{x}$ chart 1

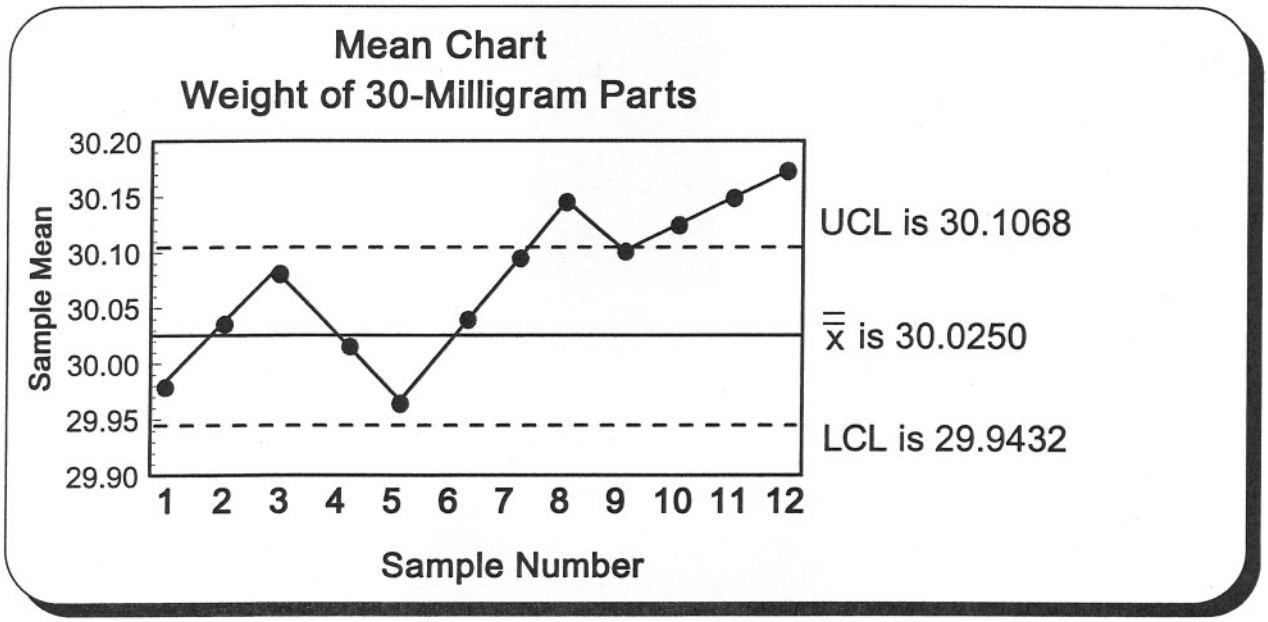
E. A range chart 6

F. A p chart 2

| | |
|---|---|
| 1. | Measures whether the mean size, weight, or temperature, etc., is getting too high or too low. |
| 2. | Measures whether the proportion of some attribute (defects) is appropriate. |
| 3. | Results from an identifiable cause |
| 4. | Is due to chance |
| 5. | Measures a process value (statistic) sequentially over a period of time |
| 6. | Measures whether variation in size, weight, or temperature, etc., is too large. |

II. Control charts developed in Practice Set 17 will now be used to determine whether the 30-milligram part manufacturing process is in control. Plot this data on the appropriate control chart and determine whether the process is in control.

| Sample | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Mean | 29.98 | 30.04 | 30.08 | 30.02 | 29.97 | 30.04 | 30.09 | 30.15 | 30.10 | 30.12 | 30.14 | 30.16 |
| Sample Range | 0.07 | 0.09 | 0.11 | 0.13 | 0.10 | 0.09 | 0.08 | 0.14 | 0.18 | 0.21 | 0.22 | 0.21 |
| Proportion of Defects | 0.08 | 0.11 | 0.14 | 0.17 | 0.23 | 0.21 | 0.19 | 0.17 | 0.11 | 0.09 | 0.12 | 0.21 |




**Analysis:** The process appears out of control. With a 99.74% confidence level, one sample beyond a control limit should happen only 26 times out of 10,000 samples. Three samples in a row and four out of five beyond the 99.74% confidence interval is unlikely for a process under control.