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DEPARTMENT OF AEROSPACE ENGINEERING

19MEE304 Total Quality Management

Unit -3

Two Mark Question and Answers

1. What is statistics in quality management?

Statistics in quality management involves data collection, analysis, and interpretation to improve process performance and product quality.

2. What are the two types of statistics used in quality control?

- *Descriptive statistics (summarizing data)*
- *Inferential statistics (making predictions based on data)*

3. What are the three measures of central tendency?

- *Mean (average)*
- *Median (middle value)*
- *Mode (most frequent value)*

4. What is dispersion in statistics?

Dispersion refers to the spread of data points in a dataset, indicating variability.

5. List two common measures of dispersion.

- *Range (difference between highest and lowest values)*
- *Standard deviation (average deviation from the mean)*

6. Differentiate between population and sample.

- *Population: The entire group being studied.*
- *Sample: A subset of the population used for analysis.*

7. Why is sampling important in quality control?

Sampling helps in analyzing large datasets efficiently while reducing time and cost.

8. What are control charts in quality management?

Control charts are statistical tools used to monitor process stability by plotting data over time.

9. Differentiate between control charts for variables and attributes.

- *Variable control charts measure continuous data (e.g., weight, temperature).*
- *Attribute control charts measure discrete data (e.g., defect count, pass/fail).*

10. Give two examples of variable control charts.

- *\bar{X} -chart (mean chart)*
- *R-chart (range chart)*

11. Give two examples of attribute control charts.

- *P-chart (proportion of defective items)*
- *C-chart (count of defects per unit)*

12. Give an industrial example of a control chart application.

In automobile manufacturing, control charts are used to monitor the consistency of engine part dimensions.

13. How is SPC (Statistical Process Control) applied in the food industry?

SPC ensures food weight, packaging, and ingredient proportions remain consistent during production.

14. What is process capability?

Process capability measures how well a process produces output within specification limits.

15. What is the significance of Cp and Cpk in process capability?

- *Cp measures the potential capability of a process.*
- *Cpk adjusts Cp based on how centered the process is within the specification limits.*

16. What are the 5S principles?

- *Sort (Seiri) – Remove unnecessary items.*
- *Set in order (Seiton) – Organize essential items.*
- *Shine (Seiso) – Clean the workspace.*
- *Standardize (Seiketsu) – Create standardized procedures.*
- *Sustain (Shitsuke) – Maintain and improve continuously.*

17. Why is 5S important in industries?

5S improves efficiency, reduces waste, and enhances workplace safety.

18. What is Six Sigma?

Six Sigma is a data-driven methodology for reducing defects and improving process quality.

19. What are the five phases of Six Sigma (DMAIC)?

- *Define*
- *Measure*
- *Analyze*
- *Improve*
- *Control*

20. Give an industrial case study of Six Sigma implementation.

General Electric used Six Sigma to reduce defects in aircraft engines, saving millions in production costs.

21. List any two of the new seven management tools.

- *Affinity diagram*
- *Interrelationship diagram*

22. What is an affinity diagram?

An affinity diagram organizes large amounts of data into meaningful categories for problem-solving.

23. What is an interrelationship diagram used for?

It helps visualize cause-and-effect relationships among different factors in a complex problem.

24. What is the purpose of a tree diagram?

A tree diagram breaks down broad objectives into smaller, actionable tasks.

25. How do the new seven management tools help in decision-making?

They enhance problem-solving, organize information, and support strategic planning.