

BA5107 Total quality management

2mark Question with Answer

Unit-IV

Quality Function Development

1. What is QFD?

Quality function Deployment (QFD) may be defined as a system for translating consumer requirement into appropriate requirements at every stage, from research through product design and development, to manufacture, distribution, installation and marketing, sales and service.

2. What are the objectives of QFD?

The objectives of QFD are:

- To identify the true voice of the customer and to use this knowledge to develop products which satisfy customers.
- To help in the organization and analysis of all the pertinent information associated with the project.

3. What do you mean by House of quality?

The primary planning tool used in QFD is the House of Quality (HOQ). The house of quality converts the voice of the customer into product design characteristics. QFD uses a series of matrix diagrams, also called 'quality tables' that resemble connected houses.

4. What are the six sections of a basic house of quality matrix?

The six sections of a basic house of quality matrix are:

1. Customer requirement
2. Prioritized customer requirements
3. Technical descriptors
4. Relationship matrix
5. Trade- off matrix
6. Prioritized technical descriptors

5. What are the four planes of product development in QFD process?

1. Product planning
2. Part development
3. Process planning
4. Production planning

6. List out any four benefits of QFD?

QFD is a communication and planning tool that:

- Promote better understanding of customer demands.
- Improves customer satisfaction.
- Promotes team work.
- Facilitates better understanding of design interactions.

7. What is FMEA?

Failure Mode and Effect Analysis (FMEA), also known as risk analysis, is a preventive measure to systematically display the causes, effects and possible actions regarding observed failures.

8. State the objective of FMEA?

The objective of FMEA is to anticipate failures and prevent them from occurring FMEA priorities failures and attempts to eliminate their causes.

9. What are the various types of FMEA?

The various FMEA are:

1. System FMEA
2. Design FMEA
3. Process FMEA
4. Service FMEA
5. Equipment FMEA
6. Maintenance FMEA
7. Concept FMEA
8. Environmental FMEA

10. List out any four benefits of FMEA?

Benefits of FMEA include:

- Improved product/ process reliability and quality
- Increased customer satisfaction
- Early identification and elimination of potential product/ process failure modes.
- Prioritized product/ process deficiencies.

11. What are the inputs for preparation of FMEA?

- People inputs
- Data inputs

12. List the four stages of FMEA?

- 1) Specifying possibilities
- 2) Quantifying risk
- 3) Correcting high risk causes
- 4) Re-evaluation of risk

13. Differentiate the terms Failure Mode and Failure effects?

- Failure mode is defined as the manner in which a component, subsystem, system, process, etc., could potentially fail to meet the design purpose.
- A failure effect is defined as the result of a failure mode on the function of the product/ process as perceived by the customer.

14. Define risk priority number (RPN)?

- The Risk Priority Number (RPN) is defined as the product of the severity (S), occurrence (O), and detection (D) rankings. That is, $RPN = (S) * (O) * (D)$.
- The RPN is used to priorities items that require additional quality planning or action.

15. What are Taguchi methods?

- Taguchi methods are statistical methods developed largely by Genichi Taguchi to improve the quality of manufactured goods.
- Taguchi's principle contributions to statistics are:
 - 1) Taguchi loss function.
 - 2) The philosophy of offline quality control.
 - 3) Innovations in the design of experiments.

16. Define quality in terms of Taguchi's words?

Taguchi define quality as "the loss imparted by the product to society from the time the product is shipped".

17. Write down the philosophy of quality loss function?

The loss function philosophy says that for a manufacturer, the best strategy is to produce products as close to the target as possible, rather than aiming at "being within specifications".

18. State the concept of quality loss function?

The essence of the quality loss function (QLF) concept is that whenever a product deviates from its target performance, it generates a loss to society. This loss is minimal when performance is right on target, but it grows gradually as one deviates from the target.

19. List the seven tools of quality?

- i. Check sheets
- ii. Histograms
- iii. Cause and effect diagrams
- iv. Pareto diagrams
- v. Stratification analysis
- vi. Scatter diagrams
- vii. Control charts

20. What is check sheet?

A check sheet or tally sheet is a form for systematic data gathering and registering to get a clear view of the facts.

21. What do you use the check sheet?

A check sheet is used to indicate the frequency of a certain occurrence.

22. What are the types of check sheets commonly used?

- 1) Process distribution check sheet
- 2) Defective item check sheet
- 3) Defect location

23. What is histogram?

A histogram is a bar chart/ diagram showing a distribution of variable quantities or characteristics. It is graphical display of the frequency distribution of numerical data.

24. When do you use histogram?

- A histogram is used to show clearly where the most frequently occurring values are located and the data is distributed.
- It enables the analyst to quickly visualize the features of a complete set of data.

25. What is cause and effect diagram? Under what situations, one can use cause and effect diagram?

- The cause and effect diagram or Fishbone diagram is a graphical-tabular chart to list and analyze the potential cause of a given problem.
- The cause and effect diagram has unlimited application in research manufacturing, marketing, office operations, services, etc.

26. What are the uses of CE diagram?

The cause and effect diagrams are used:

- To analyse cause and effect relationships
- To facilitate the search for solutions of related problems

- To standardize existing and proposed operations
- To educate and train personnel in decision- making and corrective action activities.

27. What is pareto diagram?

A pareto diagram is a diagnostic tool commonly used for separating the vital few causes that account for a dominant share of quality loss.

28. State the pareto principle?

Pareto principle states that a few of the defects accounts for most of the effects.

29. What are the purpose of are to diagrams?

- Pareto analysis can be used in a wide range of situations, where one need to priorities problems based on its relative importance.
- It can be used as a risk assessment technique from activity level to system level.

30. What is stratification?

Stratification is a method of analysis of data by grouping it in different ways.

31. What is scatter diagram?

The scatter diagram is a simple graphical device to depict the relationship between two variables.

32. When do you use the scatter diagram?

- The purpose of the scatter diagram is to display what happens to one variable when another variable is changed.
- This diagram is used to understand why particular variations occur and how they can be controlled.

33. List out the new seven management tools?

- 1) Affinity diagram

- 2) Relationship diagram
- 3) Tree diagram
- 4) Matrix diagram
- 5) Decision tree (PDPC)
- 6) Arrow diagram
- 7) Matrix data analysis diagram

34. What is affinity diagram?

An affinity diagram is a tool to collect a large amount of verbal expressions (ideas, opinions, observations, etc.) and organize them in groups according to natural relationships between individual items.

35. When do you use affinity diagram?

Affinity diagram is used:

1. To provide a visual representation of large amount of ideas.
2. To determine logical priorities.
3. To extract the large amount of useful information from few or scattered data or from unrelated ideas.
4. To understand and organize problems those are not clear.
5. To create new concepts.

36. What is relationship diagram?

The relationship diagram is a tool for finding causes to a problem. The relationship diagram not only clarifies the relationship between cause and effect but also between the various causes.

37. When do we use relationship diagram?

The purpose of the relationship diagram is to generate a visual representation of the relations between an effect and its causes as well as the inter-relationship between the different causes of the problem.

38. What is tree diagram?

A tree diagram systematically breaks down a topic into its component's elements, and shows the logical and sequential links between these elements. The

tree diagram systematically outlines the complete spectrum of paths and tasks that must be carried out to achieve a goal.

39. When do we use tree diagram?

The purpose of the tree diagram is to explore the ways and means to achieve the objective, develop a list of alternative means and to present them in visual understandable form.

40. What is matrix diagram?

A matrix diagram is a tool that is used to systematically organize information that must be compared on a variety of characteristics in order to make a comparison, selection or choice.

41. When do we matrix diagram?

The matrix diagram is used to show relations between individual items in two sets of factors.

42. What is decision tree or process decision program chart (PDPC)?

A decision tree or PDPC is a planning tool to outline every conceivable and likely occurrence in any planning.

43. When do we use decision tree?

- The PDPC or decision tree is useful when one wants to plan all possible chains of events that might occur during a project.
- This tool is particularly used in new product development, building and equipment, and data processing programs.
- This tool is widely used in decision making when the task is new, complex and unique.

44. What is arrow diagram?

An arrow diagram is a graphic description of the sequential steps that must be completed before a project can be completed.

Example: PERT and CPM charts.

45. When do we use arrow diagram?

1. The main purpose of the arrow diagrams are:
 - The show the paths to complete a project.
 - To find the shortest time possible for the project.
 - To display graphically simultaneous activities.
2. The arrow diagram is indispensable for long-term projects, such as the construction of a plant or the development of new products.

46. What matrix data analysis diagram?

A matrix data analysis diagram is very much similar to a matrix diagram with a difference that numerical data is used instead of symbols indicating the existence and strength of relationship.

47. When do we use matrix data analysis diagram?

The purpose of matrix data analysis diagram is to present numerical data about two sets of factors in a matrix form and analyse it to get numerical output. This tool is used in principal component analysis where only two characteristics can be studied at a time.

48. In what way, matrix data analysis diagram differs from all other management tools?

Matrix data analysis diagram is the only tool among the 'new seven management tools' which uses numerical data and produces numerical results.

49. What is benchmarking?

Benchmarking is the process of identifying, understanding, and adapting, outstanding practices and process from organization anywhere in the world to an organization to improve its performance.

50. What are the objectives for benchmarking?

- 1) Benchmarking aims at a goal setting process facilitate comparison with the best.

- 2) It aims at motivating and stimulating company employees towards the goal of continuous quality improvement.
- 3) It aims at external orientation of the company.
- 4) It aims at identifying a technological breakthrough
- 5) It aims at searching for industry best practices.

51. What are the different types of benchmarking in relation to objects being benchmarked?

- 1) Product benchmarking
- 2) Performance benchmarking
- 3) Process benchmarking
- 4) Strategic benchmarking

52. Classify benchmarking based on the nature of firms against which benchmarking could be done?

- 1) Internal benchmarking
- 2) Industry benchmarking
- 3) Competitive benchmarking
- 4) Best-in-class benchmarking
- 5) Relationship benchmarking

53. List out any four benefits of benchmarking?

The benefits of competitive benchmarking include:

- 1) Creating a culture that values continuous improvement to achieve excellence.
- 2) Sharing the best practices between benchmarking partners.
- 3) Prioritizing the areas that need improvement.
- 4) Enhancing creativity by devaluing the not-invented-here syndrome.