

UNIT I- INTRODUCTION

PART-A

1. Define Quality. (Apr. 12, Apr. 14)

A. 1. Fitness for intended use. (Joseph Juran). 2. Conformance to specifications. (Philip Crosby). 3. The totality of features of a product or service that bears on its ability to satisfy a stated or implied need.

2. Define Total Quality Management. (Dec. 11, Nov. 13)

A. 1. The art of managing the total organization to achieve excellence in all spheres of activity. (Bester field). 2. The integration of all functions and processes within an organization in order to achieve the continuous improvement of the quality of goods and services. (Omachonu).

3. Mention the basic features of TQM. (June. 13)

A. 1. Management commitment, 2. Focus on customer (both external and internal), 3. Employee Involvement, empowerment, 4. Continuous improvement, 5. Treating suppliers as partners, and 6. Establish performance measures for processes.

4. What are the major benefits of TQM? (Dec. 11, Dec. 14, Apr. 14)

A. Improved quality, higher productivity, employee participation, teamwork, working relationships, customer satisfaction, employee satisfaction, communication, profitability, market share, and stock price performance.

5. What are some major obstacles to TQM implementation? (Apr. 12)

A. Lack of management commitment, Inability to change organizational culture, Improper planning, Lack of continuous training and education, Paying inadequate attention to internal and external customers, Inadequate use of empowerment and teamwork, Lack of employee involvement, Emphasis on short-term results, etc.

7. What is quality planning?

A. Systematic process that translates quality policy into measurable objectives and requirements, and lays down a sequence of steps for realizing them within a specified timeframe.

8. What is quality habit? (May. 11)

A. Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives.

9. What are the seven deadly diseases?

A. Lack of constancy of purpose, Emphasis on short-term profits, Evaluation of performance, Mobility of management, Management by use only of visible figures, with little or no consideration of figures that are unknown or unknowable, Excessive Medical Costs, Excessive costs of liability.

10. What is quality according to Juran? (Dec. 12)

A. Juran defines quality as fitness for use in terms of design, conformance, availability, safety & field use.

11. What is quality control?

A. Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client or customer.

12. Explain Crosby's quality vaccine?

A. There are three main segments in the quality vaccine, determination, education and implementation.

13. What are the four absolutes of quality?

A. (1) Quality means conformance to requirements, not elegance. (2) Quality is achieved by prevention, not appraisal. (3) The performance standard is zero defects, not acceptable quality levels. Quality is free. (4) Quality is measured by the price of non-conformance, not indexes.

14. How can quality be quantified?

A. Quality is mostly subjective but it can be quantified in terms of perceived expectations of the customers and the actual performance delivered by the product. $Q = P / E$

15. What is TQM triangle?

A. The essence of the total quality management concept is a triangle, each corner being a key point; the focus on the customer, Continuous improvement, and teamwork.

16. Mention the names of some major contributors to the quality movement.

A. Edwards Deming, Joseph M. Juran, Philip Crosby, Feigenbaum, Ishikawa, Taguchi, Shingo, Walter Shewhart, etc.

17. What is Deming Cycle?

A. P-D-S-A (Plan-Do-Study-Act) cycle of continuous improvement.

18. What are the measure dimensions of service quality? (Nov. 13, June. 13)

A. Service duration, Timeliness, Completeness, Consistency, Convenience, Accuracy, Courtesy.

19. What are the elements of TQM? (Dec. 14)

A. Ethics, Integrity, Trust, Training, Teamwork, Leadership, Recognition, Communication.

20. What is customer satisfaction? (Apr. 14)

A. Customer satisfaction is a marketing term that measures how products or services supplied by a company meet or surpass a customer's expectation.

PART B

1. Explain the dimensions of quality? (Nov. 11)

2. Write notes on quality cost. (Dec. 06)

3. State and explain the barriers to TQM implementation in an organization. (Dec. 12, Dec. 14)

4. Explain the contributions of Deming to TQM. (Nov. 13, Dec. 14, Apr. 14)

5. Explain the basic concepts of TQM? (Nov. 13)

6. Explain the concepts of TQM principles. (June. 09)

7. What is service Quality? Explain Its various elements towards Customer Satisfaction? (Dec. 14)

8. Explain the steps involved in forming a performance appraisal System. What are the benefits? (Apr. 14)

9. Explain the evolution of TQM.

10. Explain the dimensions of product quality

UNIT-II- TQM PRINCIPLES

PART A

1. Why should suppliers be treated as partners?

A. Costs due to inferior materials/components from suppliers increase costs in the later stages of production. Suppliers themselves are part of the whole system and hence should be treated as long-term partners.

2. What is the 'Juran Trilogy' ('Quality Trilogy')? (Dec. 11)

A The **Juran Trilogy (Quality Trilogy)** consists of three inter-related processes – quality planning, quality control, and quality improvement – for managing quality.

3. What is meant by 'Cost of quality'?

A. Quality costs are defined as costs associated with non-achievement of product/service quality. In simple terms, quality cost is the cost of poor products/services. All costs associated with poor quality and its correction is integrated into one system to enhance the quality management function.

4. What are the four categories of quality costs?

A. 1. Prevention costs, 2. Appraisal costs, 3. Internal failure costs, and 4. External failure costs.

5. What are internal failure costs?

A. These are costs required to identify, repair, replace, or dispose off defective products/services prior to delivery to the customer.

6. What are Quality Circles (QC)?

A. QC is a small team of people (around 8 to 10) coming from the same work area/department who voluntarily meet on a regular basis (about an hour every week) to identify, investigate, analyze and solve work-related problems. QC can be viewed from three angles: (i) as a form of participative management, (ii) as a HRD technique, and (iii) as a problem-solving technique

7. What are the roles assigned to people in Quality Circles?

A. The QC organization has a four-tier structure consisting of *Members, Leaders, Facilitators, and Steering Committee.*

8. What is motivation?

A. Scott defines motivation is the process of stimulating people to accomplish desired goals.

9. What is meant by empowerment? (Dec. 12)

A. Empowerment means entrusting people with authority and responsibility.

10. Mention some major objectives of Quality Circle projects.

A. 1. Improve quality and productivity. 2. Cost reduction. 3. Effective utilization of resources.

4. Avoid unnecessary errors, defects. 5. Solve work-related problems that interfere with production, etc

11. What are the Japanese 5S principles? (Dec. 11, Apr. 14)

A. The 5S's stand for five Japanese words: **Seiri, Seiton, Seiso, Seiketsu, and Shitsuke.** In English, they mean *Sort, Arrange, Clean up, Systematize, and Discipline* respectively.

12. What are the various quality statements?

A. The quality statements include the vision statement, mission statement, and quality policy statement.

13. What is a Vision statement?

A. A short declaration of what an organization aspires to be in the future. It is an ideal state that an organization continually strives to achieve. It is timeless, inspirational, and becomes deeply shared within the organization.

14. What is a Mission statement?

A. The mission statement answers the following questions: who we are, who are our customers, what we do, and how we do it. The mission provides the guide map, milestones for achieving the vision. 9. What is the importance of customer focus for an organization?

A. Customers are the most important asset of an organization. An organization's success depends on how many customers it has, how much they buy, how often they buy, and how long they are retained (loyalty).

15. Distinguish between 'internal customer' and 'external customer'.

A. An *external customer* exists outside the organization and can be defined in many ways – user, buyer, and influencer. He generally falls into one of three categories: current, prospective, or lost customer. Every function within the organization – engineering, production, order processing, etc. – has an *internal customer*. Every person in a process is considered a customer of the preceding operation. For example, Manufacturing is a customer for Purchasing, and Dispatching is a customer for Packaging.

16. What is importance of customer retention?(Dec. 14)

A. It costs a company six times more to sell a product to a new customer than it does to sell to an existing one. Loyal customers generate more revenue, and are also cheaper to maintain. Customer loyalty facilitates cross-selling/up-selling of a company's other products/services, and also acts as an effective barrier to the entry of competition.

17. Mention some benefits of implementing 5S principles.

A. 5S increases productivity, eliminates waste, reduces inventory, creates a pleasant workplace, improves safety, and increases the overall efficiency and effectiveness of people and machines.

18. Explain Kaizen (Dec. 11)

Kaizen, which is a Japanese word that means gradual and orderly continuous improvement, is a Philosophy that covers all business activities and everyone in an organization. In the kaizen philosophy, improvement in all areas of business – cost, meeting delivery schedules, employee safety and skill development, supplier relations, new product development, and productivity – serve to improve the quality of the firm. Thus, any activity directed toward improvement falls under the kaizen umbrella.

19. Explain Supplier Rating.

A supplier rating system (often called a scorecard system) is usually based on quality, delivery, and service; however, some customers have added other categories, such as lead time, product support, technology, etc.

20. Distinguish between Reward and Recognition. (Dec. 2010)

A. Recognition & reward: Creating incentives for suppliers is one way to ensure that they remain committed to a quality improvement strategy. Incentives may be in the form of a preferred supplier category with its rewards. Recognition may be in the form of publication of outstanding contributions in the customer's newsletter, a letter of commendation, or a plaque.

PART B

1. Explain the different types of Teams, and explain the various steps involved in developing a team. (Dec. 12, Nov. 13, Dec. 14)
2. Explain all the elements in 5'S principle and also the implementation procedure of 5'S in a Manufacturing company. (Dec. 07, Dec. 11, Nov. 13)
3. Explain in detail the concept of employee involvement. (Dec. 14)
4. Discuss about the three quality statements giving an example for each. (Dec. 14)
5. Explain briefly how employee empowerment relate to employee improvement. (Dec. 14)
6. What are the factors that KAIZEN focuses for continuous improvement? (Dec. 14)
7. Explain in detail about Juran Trilogy? (Apr. 14)
8. Write short notes on Quality planning? (Apr. 14)
9. Define motivation and explain any two theories of motivation.
10. Explain the different approaches towards continuous process improvement.

UNIT-III -TQM TOOLS AND TECHNIQUES

PART A

1. List the seven tools of quality. (Dec. 13)

1. Check sheets, 2. Histograms, 3. Cause and effect diagrams, 4. Pareto diagrams, 5. Stratification analysis, 6. Scatter diagrams, and 7. Control charts.

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

3. What is six sigma? (Dec. 09, Apr.14)

Six sigma is similar to Zero Defects (ZD), is a philosophical benchmark or standard of excellence proposed by Philip Crosby. Six sigma strives for perfection. It allows for only 3.4 defects per million opportunities (or 99.99966 percent accuracy).

4. 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.

5. What is process capability? (May. 11)

A. Process capability analyses the relationship between two aspects of process like on design specification. If the specification limit is greater than control limits the process is capable of meeting specification and if it exceeds is not capable of meeting specifications.

6. What are the various types of histogram?

1. Bell-shaped. 2. Double-peaked. 3. Plateau. 4. Comb. 5. Skewed. 6. Truncated. 7. Isolated peak and. 8. Edged peak.

7. What is cause and effect diagram?

The cause and effect diagram or Fishbone diagram is a graphical-tabular chart to list and analyze the potential causes of a given problem.

8. Under what situations, one can use cause and effect diagram?

The cause and effect diagram has unlimited application in research manufacturing, marketing, office operations, services, etc.

9. What are the measure benefits of six sigma? (Dec. 12)

A. In addition to a focus on defect, six sigma seeks to improve all aspects of operation. The key matrices include cycle time, process variation and yield.

10. 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.

11. What are the purposes of pareto principle.

Pareto analysis can be used in a wide range of situations, where one need to priorities problems based on its relative importance.

12. What is stratification?

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

13. What is scatter diagram?

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

14. 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.

15. When do you use control chart?

The purpose of control chart is to identify when the process has gone out of statistical control, thus signaling the need for some corrective action to be taken.

16. Define statistics applications of statistical techniques?

Statistics is defined as the science that deals with the collection, tabulation, analysis, interpretation and presentation of quantitative data.

17. What is Risk Prioritization Number? (May. 12)

It is a number used to prioritize the risk of failure in Failure Mode and Effect Analysis. It ranges from 1 to 1000 and it's the multiplication of severity, detection and occurrence.

18. What is the use of prioritization matrices? (Dec. 14)

A prioritization matrix is a simple tool that provides a way to sort a diverse set of items into an order of importance. It also identifies their relative importance by deriving a numerical value for the priority of each item.

19. What is Bench Marking?(Apr. 14)

A. Benchmarking is the process of comparing the cost, cycle time, productivity, or quality of a specific process or method to another that is widely considered to be an industry standard or best practice.

20. What is quality loss? (Apr. 14)

A. Mathematical formula that estimates the loss of quality resulting from the deviation of a product characteristic from its target value. It is developed by Dr. Genichi Taguchi of Japan.

PART B

1. Explain tools for quality of TQM. (May. 10, Dec. 12, Apr. 14)
2. Explain six sigma concepts with example. (June. 13, Dec. 14)
3. Explain the cause and effect diagram (or) fishbone diagram.(Dec. 14)
4. Explain bench marking and its steps. (Nov. 13)
5. Explain new seven TQM tools. (May. 08, Dec. 11)
6. Explain about stages of FMEA.(Apr. 14)
7. What is a Tree Diagram? How is it useful for quality management? (Dec. 14)
8. What is a Critical Success Factor? How is it important in Bench Marking? (Dec. 14)
9. Explain PCPC with an example.
10. Explain the failure mode and effect analysis (FMEA).

UNIT-IV -TQM TOOLS AND TECHNIQUES - II

PART A

1. What is quality circle? (June. 13, Nov. 13)

A. QC is a group activity practiced at regular intervals which focuses on quality practices.

2. What is the structure of Quality Circle?

A. Executive committee, steering committee, facilitators, QC leader, Deputy leader, members 5-8%.

3. What is the usefulness of the Product Life Characteristics Curve?

A. Knowing the product life characteristics curve for a particular product helps engineers predict failure behavior and take suitable decisions.

4. What is the essential feature of Total Productive Maintenance (TPM)? (May. 12, Nov. 13)

A. TPM is keeping plant and equipment at their highest productive level through cooperation of all areas of the enterprise. TPM brings maintenance into focus as a necessary and vital part of the business. It is not regarded as a non-profit activity. Down time for maintenance is scheduled as an integral part of the manufacturing process.

5. What are the overall goals of TPM? (Nov. 08)

A. The overall goals of TPM are: Maintaining and improving equipment capacity. Maintaining equipment for life. Using support from all areas of operation. Encouraging inputs from all employees. Using teams for continuous improvement.

6. What is meant by house of quality?

A. it is the first area in QFD process, it is used to translate VOC in to design requirement in order to ensure that all engineering decisions have the basis to meet the customer needs.

7. What are the steps used to build house of quality?

A. To identify customer needs, technical features, relate both, conduct evaluation of competing products, determine which characteristics to display in production process.

8. What are the eight pillars of TPM?

A. The eight pillars of TPM are: [1] 5S, [2] *Jishu Hozen (Autonomous Maintenance)*, [3] *Kobetsu Kaizen (KK)*, [4] *Planned Maintenance (PM)*, [5] *Quality Maintenance (QM)*, [6] *Training*, [7] *Office TPM*, and [8] *Safety, Health and Environment*.

9. What are the three categories of losses identified in TPM?

A. (A) Losses that impede equipment efficiency (B) Losses that impede human work efficiency and (C) Losses that impede effective use of production resources.

10. What is Office TPM?

A. Office TPM is aimed at improving quality, productivity and efficiency in the administrative functions and identifying and eliminating losses.

11. What is Business Process Reengineering (BPR)?

A. The fundamental rethinking and radical redesign of business processes to improve performance dramatically in terms of measures like cost, quality, service, and speed.

12. What is Taguchi's Loss function? (May. 12)

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

13. Give Taguchi's definition of quality.

A. "loss imparted to society by a product during its life cycle", i.e. the costs incurred in the production process as well as the costs encountered during use by the customer..

14. What is voice of customer?

A. It is the requirements of the customers in a product and the requirements are described by them in their own words.

15. What are the four categories of quality costs?

A. 1. Prevention costs, 2. Appraisal costs, 3. Internal failure costs, and 4. External failure costs.

16. What are internal failure costs and external failure costs? (May. 12)

A. Internal: These are costs required to identify, repair, replace, or dispose off defective products/services prior to delivery to the customer. External: Cost of warranty, cost of loss of image, cost of service etc.

17. What are the performance measures of TQM?

A. Customer orientation, value based operations, performance compatibility, teamwork, development monitoring.

18. What is QFD?

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

19. What is Poka Yoke?

A. Poka Yoke is Mistake proofing. Humans are tend to make mistakes. Designing the product with the ability to alarm or inform the humans that their handling is wrong.

20. What are the objectives of TPM?(Apr. 14)

A. Avoid wastage in a quickly changing economic environment, Producing goods without reducing product quality, Reduce cost, Produce a low batch quantity at the earliest possible time, Goods send to the customers must be non-defective, Improving equipment effectiveness, Improving maintenance efficiency and effectiveness, Early equipment management and maintenance prevention.

PART B

1. Explain about Taguchi's Quality Loss Function. (June. 13, May. 12, Dec. 14)

2. Briefly explain the steps involved in QFD (Nov. 12, Nov. 13)

3. Explain each section of the basic structures of house of quality. (May. 10, June. 13, Apr. 14)

4. Discuss objectives of quality function deployment. (Dec. 14)

5. What are quality circles? Explain the structure of quality circles with its relative merits. (Dec. 14)

6. Explain in detail performance measures used in industries. (Dec. 14)

7. List and explain the various measures of performance in evaluating the success of an Organization. (Dec.14)

8. What are the stages involved in developing TPM? (Apr. 14)

9. Explain about TQM philosophy. (Dec. 11, Dec.12)

10. Explain the types and the analysis techniques of cost of quality. (June 13)

UNIT V – QUALITY SYSTEMS

PART A

1. What are the general requirements of quality management system? (Dec. 11)

A. The organization shall establish, document, implement and maintain a quality management system and continually improve its effectiveness in accordance with the requirements of this International Standard.

2. What are ISO 9000 quality standards? (June. 07, Nov. 13)

A. ISO 9000 are a set of quality standards aimed at promoting the growth of international trade by facilitating harmonious interactions between suppliers and customers located in diverse locations globally. It is a quality management system [QMS] to ensure quality of products and services.

3. Define Quality Management Systems?

A. Quality management systems are the organizational structures, responsibilities, processes, procedures, and resources used for implementing quality.

4. Give any five elements of ISO 9000.

A. [1] Management responsibility, [2] Quality system, [3] Contract review, [4] Design control, [5] Document control, [6] Purchasing, [7] Purchaser supplied product, [8] Product identification and traceability, [9] Process control, [10] Inspection & testing

5. What are the different types of documents found in ISO 9000? (Apr. 14)

- A.1) Quality Policy Manual (*What? Why?*)
- 2) Quality System Procedures (*Who? When? Where?*)
- 3) Work Instructions (*How?*)
- 4) Records, formats, forms (*Evidence*)

6. What are the eight quality principles underlying ISO 9000: 2000?

- A. [1] Customer focus, [2] Leadership, [3] Involvement of people, [4] Process approach, [5] System Approach to management, [6] Continuous improvement, [7] Decisions based on facts, and [8] Mutually beneficial supplier relationships.

7. Define quality system audit. (May. 10)

- A. Quality system audits is a systematic, independent examination to determine whether quality activities and results comply with planned arrangements, whether these arrangements are implemented effectively, and whether these are suitable to achieve objectives.

8. What are the different types of audit?

- A. First party audit (internal), Second party audit (by customer), and Third party audit (by independent agency). *Another classification:* System audit, Process audit, Product audit, Adequacy audit, and Compliance audit.

9. What are the different stages in conducting quality audit?

- A. 1. Audit planning – schedules, personnel, notifications, checklist.
- 2. Performance – opening meetings, audit process, noting of non-conformities.
- 3. Reporting – Observations, suggestions for corrective action
- 4. Follow-up – implementation of corrective action.

10. What are the quality function needs served by the computer?

- A. [1] data collection, [2] data analysis and reporting, [3] statistical analysis, [4] process control, [5] test and inspection, and [6] system design.

11. What are the documentation requirements of quality management systems?

- A. The quality management system documentation shall include
- a) Documented statements of a quality policy and quality objectives,
 - b) A quality manual
 - c) Documented procedures and records required by this International Standard, and
 - d) Documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of its processes.

12. What is quality manual?

- A. The organization shall establish and maintain a quality manual that includes
- a) the scope of the quality management system, including details of and justification for any exclusions
 - b) the documented procedures established for the quality management system, or reference to them, and
 - c) a description of the interaction between the processes of the quality management system.

13. Explain the management's responsibility for ISO.

- A. Top management shall provide evidence of its commitment to the development and implementation of the quality management system and continually improving its effectiveness by a) communicating to the organization the importance of meeting customer as well as statutory and regulatory requirements, b) establishing the quality policy, c) ensuring that quality objectives are established, d) conducting management reviews, and e) ensuring the availability of resources.

14. What is the need for ISO standards?

- A. ISO 9000 is needed to unify the quality terms and definitions used by industrialized nations and use terms to demonstrate a supplier's capability of controlling its processes.

15. What is third party audit? (Dec. 10)

- A. The third party certification audit is carried out much in the same way as first party and second party quality system assessments and audits. However, the big difference is that an independent accredited

auditing body carries out the assessment and audit, as opposed to carrying it out by the organization themselves.

16. Give the objectives of internal audit.

- A. a) Determine the actual performance conforms to the documented quality systems
- b) Initiate corrective action activities in response to deficiencies.
- c) Follow up on noncompliance items of previous audits.
- d) Provide continued improvement in the system through feedback to management.

17. What is Environment Management Systems Standards?(Dec. 14)

A. An EMS meeting the requirements of ISO 14001:2004 is a management tool enabling an organization of any size or type to:

- identify and control the **environmental impact** of its activities, products or services, and to
- improve** its environmental performance continually, and to
- implement a **systematic approach** to setting environmental objectives and targets, to achieving these and to demonstrating that they have been achieved.

18. What are the benefits of ISO 14001?

- A. • Facilitate trade and remove trade barriers
- improve environmental performance of planet earth
- Build consensus that there is a need for environment management and a common terminology for EMS.

19. What is QS 9000 and who have developed the system? (June. 13, Dec. 14)

A. QS 9000 is an extension of ISO 9000 and is only for automotive industries, this was developed by three big industries like Ford, Chrysler and General Motors in 1994

20. What are the uses of ISO?(Apr. 14)

A. They help to harmonize technical specifications of products and services making industry more efficient and breaking down barriers to international trade. Conformity to International Standards helps reassure consumers that products are safe, efficient and good for the environment.

PART B

1. Explain the elements of ISO 9000 standards. (Dec. 12, Dec. 13, Dec. 14, Apr. 14)
2. Discuss about implementation of ISO 9000. (Dec. 12, Dec.14)
3. Explain documentation in quality standard. (May. 11)
4. Explain Quality Audits in detail. (Dec. 11)
5. Explain ISO 14000 environmental standards. (Nov. 13)
6. Explain the benefits of ISO 9000. (June. 13, Dec.14)
7. Explain in detail about Environment Management Systems and the benefits of EMS. (May. 12, Apr. 14)
8. Explain the steps in ISO certification.
9. Discuss about implementation requirements of ISO standards to IT industries (or service sectors)
10. Explain the need, importance and evolution of ISO standards.