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# GE 2022-TOTAL QUALITY MANAGEMENT 2MARKS AND 16 MARKS

## GE2022 TOTAL QUALITY MANAGEMENT

### UNIT I INTRODUCTION

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

### UNIT II TQM PRINCIPLES

Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDCA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

### UNIT III TQM TOOLS & TECHNIQUES I

The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to manufacturing, service sector including

IT – Bench marking– Reason to bench mark, Bench marking process – FMEA – Stages, Types.

### UNIT IV TQM TOOLS & TECHNIQUES II

Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function –TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

### UNIT V QUALITY SYSTEMS

Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation,

Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits

– Case studies of TQM implementation in manufacturing and service sectors including IT.

Text book: Total Quality Management by V. Jayakumar – Lakshmi publications Chennai

Reference book: Total Quality Management by Dale H. Besterfield- Pearson

## **UNIT I INTRODUCTION**

### **2 MARKS**

#### **1. Define quality.**

- (i) Quality is defined as the predictable degree of uniformity and dependability, at low cost suited to the market. (Deming).
- (ii) Quality is defined as fitness for use (Juran).
- (iii) Quality is defined as conformance to requirements (Crosby).
- (iv) Quality is totality of the characteristics of entity that bear on its ability to satisfy stated and implied needs (ISO).

#### **2. . Define Quality?**

Quality = Performance x Expectations

#### **3. Define Total Quality?**

TQM is an enhancement to the traditional way of doing business. It is the art of managing the whole to achieve excellence. It is defined both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. It is the application of quantitative methods and human resources to improve all the processes within an organization and exceed customer needs now and in the future. It integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach.

#### **4. Give the Basic Concepts of TQM?**

- \* A committed and involved management to provide long-term top-to-bottom organizational support.
- \* An unwavering focus on the customer, both internally and externally.
- \* Effective involvement and utilization of the entire work force.
- \* Continuous improvement of the business and production process.
- \* Treating suppliers as partners.
- \* Establish performance measures for the processes.

#### **5. List the dimensions of quality.**

The dimensions of quality are

1. Performance
2. Futures

3. Conformance
4. Reliability
5. Durability
6. Service
7. Response
8. Aesthetics and
9. Repetition.

### **6. . What are the three components of the Juran Trilogy?**

The three components of the Juran Trilogy are

- i. Planning
- ii. Control
- iii. Improvement

### **7.what are the six basic concepts that a successful TQM programme requires?**

The six basic concepts that a successful TQM programme requires

1. Top management commitment
2. Focus on the customer
3. Effective employee involvement
4. Continuous improvement
5. Treating suppliers as partners and
6. Establishing performance measures.

### **8.What are the pillars of TQM?**

The four pillars of TQM are:

1. Problem solving discipline
2. Interpersonal skills
3. Teamwork and
4. Quality improvement process

### **9.Give the Objectives of TQM?**

- a. To develop a conceptual understanding of the basic principles and methods associated with TQM;
- b. To develop an understanding of how these principles and methods have been put into effect in a variety of organizations;
- c. To develop an understanding of the relationship between TQM principles and the theories and models studied in traditional management;
- d. To do the right things, **right** the first time, every time.

### **10. Give the Quality Hierarchy?**

1. Inspection
2. Quality Control (QC)
3. Quality Assurance (QA)
4. Total Quality Management

Inspect products.

Detection

Finding &

Fixing Mistakes.

### **11.Tabulate the tangible and intangible benefits of TQM.**

tangible Benefits

- \_ Improved product quality
- \_ Improved productivity

- \_ Reduced quality costs
- \_ Increased market and customers
- \_ Increased profitability
- \_ Reduced employee grievances
- Intangible Benefits
- Improved employee participation
- \_ Improved teamwork
- \_ Improved working relationships
- \_ Improved customer satisfaction
- \_ Improved communication
- \_ Enhancement of job interest
- \_ Enhanced problem-solving capacity
- \_ Better company image

### **12. What does a typical meeting agenda contain after establishing the TQM?**

Progress report on teams  
Customer satisfaction report  
Progress on meeting goals  
New project teams  
Recognition dinner  
Benchmarking report

### **16 MARKS**

1. Explain the basic concepts of TQM?
2. Elucidate the tqm framework and awareness.
3. What are the obstacles in implementing the tqm?
4. How do the dimensions of a quality of a product influence the acceptability?
5. A/C for the Historical review of tqm?
6. What are the benefits of tqm?
7. Elucidate the characteristics of quality leaders?
8. Explain Juran's 'Quality Trilogy' in detail.
9. Elaborate the Deming philosophy
- 10 Describe the evolution of management.
- 11 Enumerate the Deming's 14 points of management.

## **UNIT-2 TQM PRINCIPLES**

### **2MARKS**

#### **1. Who are internal and external customers?**

The customers inside the company are called internal customers, whereas the customers outside the company are called external customers.

#### **2. What are the customer's perceptions on quality?**

The six important customer's perceptions are:

- (i) Performance
- (ii) Features
- (iii) Service
- (iv) Warranty
- (v) Price and
- (vi) Reputation.

#### **3. List the various tools used for collecting customer complaints.**

The various tools used are:

1. Comment card.

2. Customer questionnaire
3. Focus groups
4. Toll-free telephone numbers
5. Report cards
6. The Internet and computer etc.

#### **4. What is meant by customer retention?**

Customer retention is the process of retaining the existing customers.

#### **5. What is motivation?**

Motivation means a process of stimulation people to accomplish desired goals.

#### **6. What are the Maslow's basic needs?**

Maslow's basic needs are:

1. Physiological
2. Safety
3. Society
4. Esteem and
5. Self-actualization needs.

#### **7. What are physiological needs?**

Physiological needs are the biological needs required to preserve human life.

These needs include needs for food, clothing and shelter

#### **8. List the Herzberg's motivators and dissatisfies.**

Motivator factors Dissatisfier or hygiene factors

- \_ Achievement
- \_ Recognition
- \_ The work itself
- \_ Responsibility
- \_ Advancement and growth.
- \_ Supervisors
- \_ Working conditions
- \_ Interpersonal relationships
- \_ Pay and security
- \_ Company policy and Administration

#### **9. Define empowerment. (Au Nov 05)**

Empowerment is an environment in which people have the ability, the confidence, and the commitment to take the responsibility and ownership to improve the process and initiate the necessary steps to satisfy customers requirements within well defined boundaries in order to achieve organizational values and goals.

#### **10. What are the conditions necessary for empowerment?**

The conditions required are:

1. Everyone must understand the need for change.
2. The system needs to change to the new paradigm.
3. The organization must provide information, education and skill to its employees.

#### **11. Define team and teamwork.**

- \_ A team can be defined as a group of people working together to achieve common objectives or goals.
- \_ Teamwork is the cumulative actions of the team during which each member of the team subordinates his individual interests and opinions to fulfill the objectives or goals of the group.

**12. List the different types of teams.**

The different types of teams are

1. Process improvement team
2. Cross-functional team
3. Natural work team and
4. Self-directed work team.

**13. Name different members in a team.**

The different members in a team are

1. Team leader
2. Facilitator
3. Recorder
4. Timekeeper and 5. Member

**14. What is needed for a leader to be effective?**

To be effective, a leader needs to know and understand the following:

- People, paradoxically, need security and independence at the same time.
- People are sensitive to external rewards and punishments and yet are also strongly self-motivated.
- People like to hear a kind word of praise.
- People can process only a few facts at a time; thus, a leader needs to keep things simple.
- People trust their gut reaction more than statistical data.
- People distrust a leader's rhetoric if the words are inconsistent with the leader's actions.

**15. What is the important role of senior management?**

- Listening to internal and external customers and suppliers through visits, focus groups and surveys.
- Communication.
- To drive fear out of the organization, break down barriers, remove system roadblocks, anticipate and minimize resistance to change and in general, change the culture.

**16. Give the basic steps to strategic quality planning?**

- i. Customer needs
- ii. Customer positioning
- iii. Predict the future
- iv. Gap analysis
- v. Closing the gap
- vi. Alignment
- vii. Implementation

**17. What is meant by recognition in an organization?**

Recognition is a process whereby management shows acknowledgement of a employee's outstanding performance.

**18. Classify rewards.**

1. **Intrinsic rewards:** These are related to feelings of accomplishment or selfworth.
2. **Extrinsic rewards:** These are related to pay or compensation issues.

**19. What is performance appraisal? ( Au June 06)**

Performance appraisal is a systematic and objective assessment or evaluation of performance and contribution of an individual.

**20. List four common barriers to team progress.**

The four common barriers to team progress

1. Insufficient training

2. Incompatible rewards and compensation

3. Lack of management support

**21. Give the steps involved in training process?**

The steps involved in training process are

1. Make everyone aware of what the training is all about.

2. Get acceptance.

3. Adapt the program.

4. Adapt to what has been agreed upon.

**22. Define Recognition and Reward?**

Recognition is a form of employee motivation in which the organization publicly acknowledges the positive contributions an individual or team has made to the success of the organization.

Reward is something tangible to promote desirable behavior. Recognition and reward go together to form a system for letting people know they are valuable

Members of the organization.

**23. What are the types of appraisal formats?**

The types of appraisal formats are

i. Ranking

ii. Narrative

iii. Graphic

iv. Forced choice

**24. What are the benefits of employee involvement?**

The benefits of employee involvement are

Employee Involvement improves quality and increases productivity because

i. Employees make better decisions using their expert knowledge of the Process.

i. Employees are more likely to implement and support decisions they had a part in making.

i. Employees are better able to spot and pinpoint areas for improvement.

**25. What are the basic ways for a continuous process improvement?**

The basic ways for a continuous process improvement are

i. Reduce resources

i. Reduce errors

i. Meet or exceed expectations of downstream customers

i. Make the process safer

i. Make the process more satisfying to the person doing it.

**26. What are the three components of the Juran Trilogy?**

The three components of the Juran Trilogy are

i. Planning

ii. Control

iii. Improvement

**27. What are the steps in the PDSA cycle?**

The steps in the PDSA cycle are

The basic Plan-Do-Study-Act is an effective improvement technique.

1. Plan carefully what is to be done

2. Carry out the plan

3. Study the results

4. Act on the results by identifying what worked as planned and what didn't.



## **28. What are the phases of a Continuous Process Improvement Cycle?**

The phases of a Continuous Process Improvement Cycle are

- a) Identify the opportunity
- b) Analyze the process
- c) Develop the optimal solutions
- d) Implement
- e) Study the results
- f) Standardize the solution
- g) Plan for the future

## **29. What are the three key elements to a partnering relationship?**

The three key elements to a partnering relationship are

- i. Long-term commitment
- ii. Trust
- iii. Shared vision

## **30. What are the objectives of Performance measures?**

The objectives of Performance measures are

- i. Establish baseline measures and reveal trends.
- ii. Determine which processes need to be improved.
- iii. Indicate process gains and losses.
- iv. Compare goals with actual performance.
- v. Provide information for individual and team evaluation.
- vi. Provide information to make informed decisions.
- vii. Determine the overall performance of the organization.

## **31 What are the characteristics used to measure the performance of a particular process?**

The characteristics used to measure the performance of a particular Process are

- i. Quantity
- ii. Cost
- iii. Time
- iv. Accuracy
- v. Function
- vi. Service
- vii. Aesthetics

## **32. Define 5S?**

5S Philosophy focuses on effective work place organization and standardized work procedures. 5S simplifies your work environment, reduces waste and non-value activity while improving quality efficiency and safety.

**Sort** – (Seiri) the first S focuses on eliminating unnecessary items from the workplace.

**Set In Order** (Seiton) is the second of the 5Ss and focuses on efficient and effective storage methods.

**Shine:** (Seiso) Once you have eliminated the clutter and junk that has been clogging your

work areas and identified and located the necessary items, the next step is to thoroughly

clean the work area.

**Standardize:** (Seiketsu) Once the first three 5S's have been implemented, you should



concentrate on standardizing best practice in your work area.

**Sustain:** (Shitsuke) This is by far the most difficult S to implement and achieve. Once fully implemented, the 5S process can increase morale, create positive impressions

on customers, and increase efficiency and organization.

### **33.What is a Kaizen?**

Kaizen is a Japanese word for the philosophy that defines management's role in continuously

encouraging and implementing small improvements involving everyone. It is the process of

continuous improvement in small increments that make the process more efficient, effective,

under control and adaptable.

### **16 MARKS**

1.Explain the following

a. 5 s

b. kaizen

c. supplier rating and relationship development.

2. what are the customer perception of quality ?

3. Explain how the employee will be involved in doing a process?

4.Describe the various quality statements.

5.Discuss about Moslow's need hierarchy theory and Herzberg's two factor theory for motivation.

6.What are the seven steps of strategic planning ?

7.what are the principles of customer / supplier relations ?

8.Enumerate any eight actions that an organization shall take to handle complaints.

9.. Explain in detail about various methods used for obtaining customer feedback.

10. What are the techniques commonly used for performance measures ?

## **UNIT III TQM TOOLS & TECHNIQUES I**

### **2marks**

**1.Give the seven tools of quality?**

i. Pareto Diagram

ii. Process Flow Diagram

iii. Cause-and-Effect Diagram

iv. Check Sheets

v. Histogram

vi. Control Charts

vii. Scatter Diagrams

**2.. Define Statistics?**

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

**3. What is a measure of central tendency?**

A measure of central tendency of a distribution is a numerical value that describes the central position of the data or how the data tend to build up in the center.

There are three measures in common in use in quality viz, the average, the median and the mode.

**4. What is Measures of dispersion?**

Measures of dispersion describe how the data are spread out or scattered on each side of the central value. The measures of dispersion used are range and standard deviation.

**5. What is a normal curve?**

The normal curve is a symmetrical, unimodal, bell-shaped distribution with the mean, median and mode having the same value.

**6. What is the use of the control chart?**

The control chart is used to keep a continuing record of a particular quality characteristic. It is a picture of process over time.

**7. Give the objectives of the attribute charts?**

- i. Determine the average quality level.
- ii. Bring to the attention of management any changes in the average.
- iii. Improve the product quality.
- iv. Evaluate the quality performance of operating and management personnel.
- v. Determine acceptance criteria of a product before shipment to the customer.

**8. Define Six Sigma Problem Solving Method?**

**Define** - improvement opportunity with an emphasis on increasing customer satisfaction.

**Measure** - determine process capability ( $C_p$ /  $C_{pk}$ ) & dpmo (defects per million opportunities).

**Analyze** - identify the vital few process input variables that affect key product output variables ("Finding the knobs").

**Improve** - Make changes to process settings, redesign processes, etc. to reduce the number of defects of key output variables.

**Control** - Implement process control plans, install real-time process monitoring tools, standardize processes to maintain levels.

**9. What are the new seven management tools?**

- i. Affinity Diagram
- ii. Interrelationship Digraph
- iii. Tree Diagram
- iv. Matrix Diagram
- v. Prioritization Matrices
- vi. Process Decision Program Chart
- vii. Activity Network diagram

**10. Define Benchmarking?**

Benchmarking is a systematic method by which organizations can measure themselves against the best industry practices. The essence of benchmarking is

the process of borrowing ideas and adapting them to gain competitive advantage. It is a tool for continuous improvement.

**11. Enumerate the steps to benchmark?**

- a) Decide what to benchmark
- b) Understand current performance
- c) Plan
- d) Study others
- e) Learn from the data
- f) Use the findings

**12. What are the types of benchmarking?**

- i. Internal
- ii. Competitive
- iii. Process

### **13.What are the four basic steps included in SPC?**

The four basic steps included in SPC are

- a. Measuring the process
- b. Eliminating variances in the process to make it consistent.
- c. Monitoring the process.
- d. Improving the process to its best target value.

### **14.Mention the seven basic tools involved in statistic quality control.**

The seven tools involved in statistical quality control. They are,

- a. Pareto diagram
- b. Check sheet
- c. Cause and effect diagrams
- d. Scatter diagram
- e. Histogram
- f. Control charts
- g. Graphs

### **15.What is Pareto chart?**

A Pareto chart is a special form of a bar graph and is used to display the relative importance of problems or conditions.

### **16.Give some applications of Pareto chart.**

The applications of Pareto chart are,

- a. Focusing on critical issues by ranking them in terms of importance and frequency (Example: which course causes the most difficulty for students?; which problem with product X is most significant to our customers?)
- b. Prioritizing problems or causes to efficiently initiate problem solving (Example: which discipline problems should be tackled first? or what is the most frequent complaint by parents, regarding the school? solution of what production problem will improve quality most?)

### **17.What is the use of SPC?**

SPC is used to monitor the consistency of processes used to manufacture a product as designed.

### **18.Define check sheet. Mention its uses.**

The check sheet is a data gathering and interpretation tool.

A check sheet is used for,

- a. Distinguishing between fact and opinion (Example: How does the community perceive the effectiveness of the school in preparing students for the world of work?)
- b. Gathering data about how often a problem is occurring? (Example: How often are students missing classes?)
- c. Gathering data about the type of problem occurring. (Example: What is the most common type of word processing error created by the students-grammar, punctuation, transposing letter etc.?)

### **19.What are the uses of cause and effect diagram?**

A cause and effect diagram is used for,

- a. Identifying potential causes of a problem or issue in an orderly way. (Example: why has membership in the band decreased? Why isn't the phone being answered on time? Why is the production process suddenly producing so many defects?)

b. Summarizing major causes under four categories. (Example: People, machines, methods and materials or policies, procedures, people and plant.)

**20. What is scatter diagram?**

A scatter diagram is used to interpret data by graphically displaying the relationship between two variables.

**21. List some applications of scatter diagram.**

The applications of scatter diagram

- a. Validating 'hunches' about a cause-and-effect relationship between types of variables (examples: I wonder if students who spend more time watching TV having higher or lower average GPA's? Is there a relationship between the production speed of an operator and the number of defective parts made? Is there relationship between typing speed in WPM and errors made?)
- b. Displaying the direction of the relationship (positive negative, etc). (Examples: will test scores increase or decrease if the students spend more time in study hall? Will increasing assembly line speed, increase or decrease the number of defective parts made? Do faster typists make more or fewer typing errors?)
- c. defective parts produced? How strong is the relationship between typing faster and the number of typing errors made?).

**22. Define histogram.**

A histogram is used to display in bar graph format measurement data distributed by categories.

**23. What are the problems that can be interpreted by the histogram?**

The problems that can be interpreted by the histogram are,

- a. Skew problems
- b. Clustering problems.

**24. Define control chart.**

Control chart is defined as a display of data in the order that they occur with statistically determined upper and lower limits of expected common cause variations. It is used to indicate special causes of process variations to monitor a process for maintenance and to determine if process changes have has the desired effect.

**25. What is line graph?**

A line graph is a way to summaries how two pieces of information are related and how they vary depending on one another. The numbers along a side of the line graph are called the scale.

**26. What is an arrow diagram?**

An arrow diagram is another term for a PERT or CPM chart. It is graphic descriptions of the sequential steps that must be completed before a project can completed.

**27. Give some applications of arrow diagram.**

The applications of arrow diagram are,

- a. Understanding and managing complex project or task.
- b. Understanding and managing a project that is of major importance to the organization, and the consequences of late completion are sever.
- c. Understanding and managing a project in which multiple activities must take place and be managed simultaneously.
- d. Explaining the project status to others.

**28. How is an arrow diagram constructed?**

Steps in constructing an arrow diagram are,

- Select a team that is knowledgeable about the project, its task and subtasks.
- Record all of the tasks and subtasks necessary to the completion of the project.
- Sequence the tasks.
- Assign a time duration to each task.
- Calculate the shortest possible implementation time schedule using the critical path method.
- Calculate the earliest starting and finishing times for each task.
- Locate tasks with slack (extra) time and calculate total slack.
- Update the schedule as the project is being completed.

### **29. What is nominal group technique?**

The nominal group technique is a structured process, which identifies and ranks the major problems or issues that need addressing.

### **16 MARKS**

- Explain the detail about the 7 SPC tools of quality.
- Explain the term "process capability".
- Discuss in detail about the concept of Six-Sigma.
- List out the new 7 management tools and explain each one.
- Discuss briefly the various tools of statistical fundamentals.
- Explain the QC or SPC tools?
- Explain the Seven Management Tools?
- Plot the control chart for variables and attributes
- Explain the concepts of Six Sigma?
- Explain the different steps involved in FMEA with an examples.
- problems in control charts and process capability.

## **UNIT IV TQM TOOLS & TECHNIQUES II**

### **2MARKS**

#### **1.What is a QFD?**

Quality Function Deployment is a planning tool used to fulfill customer expectations. It is a disciplined approach to product design, engineering, and production and provides in-depth evaluation of a product.

#### **2.. What are the benefits of QFD?**

- Customer driven
- Reduces implementation time
- Promotes teamwork
- Provides documentation

#### **3. What are the steps required to construct an affinity diagram?**

- Phrase the objective
- Record all responses
- Group the responses
- Organize groups in an affinity diagram

#### **4.What are the goals of TPM?**

The overall goals of Total Productive Maintenance, which is an extension of TQM are

- Maintaining and improving equipment capacity
- Maintaining equipment for life
- Using support from all areas of the operation
- Encouraging input from all employees



v. Using teams for continuous improvement

**5. Give the seven basic steps to get an organization started toward TPM?**

- a) Management learns the new philosophy
- b) Management promotes the new philosophy
- c) Training is funded and developed for everyone in the organization
- d) Areas of needed improvement are identified
- e) Performance goals are formulated
- f) An implementation plan is developed
- g) Autonomous work groups are established

**6. What are the major loss areas?**

- i. Planned downtime
- ii. Unplanned downtime
- iii. Idling and minor stoppages
- iv. Slow-downs
- v. Process nonconformities
- vi. Scrap

**7. Define TPM?**

T : Total = All encompassing by maintenance and production individuals working together.

P : Productive = Production of goods and services that meet or exceed customer's expectations.

M : Maintenance = Keeping equipment and plant in as good as or better than the original condition at all times.

**8. Define quality cost.**

Quality cost is defined as the cost associated with the non-achievement of product/service quality as defined by the requirements established by the organisation and its contracts with customers and society.

**9. List the categories of quality costs.**

The categories of quality cost are

1. Cost of prevention
2. Cost of appraisal
3. Cost of internal failures and
4. Cost of external failures.

**10. What is meant by cost of prevention?**

Prevention costs are the costs that are incurred on preventing a quality problem from arising.

**11. List the elements of cost of prevention.**

The elements of cost of prevention are

1. Cost of quality planning
2. Cost of documenting
3. Process control cost
4. Cost of training
5. Costs associated with preventing recurring defects.

**12. What is cost appraisal?**

Appraisal costs are the cost that are incurred in assessing that the products/services conform to the requirements

**13. What are the cost of appraisal?**

The cost of appraisal are

1. Cost of receiving test and equipment
2. Cost of Laboratory acceptance testing



3. Cost of installation testing
4. Cost of installation and commissioning
5. Cost of maintenance and calibration of testing and inspecting equipments.

**14. What is meant by cost of internal failures?**

The costs associated with defective products, components and materials that fail to meet quality requirements and result in manufacturing losses are called as costs of internal failures. These costs are linked to correcting mistakes before delivery of the product

**15. List the components cost of internal failures.**

The cost of internal failures are

1. Cost associate with scrap and rejects.
2. Cost of repair and rework.
3. Cost of design changes.
4. Cost of trouble shooting
5. Cost of reinspection and retesting., etc;

**16. What is meant by cost of external failures?**

It consist of the cost which are generated because of defective products being shipped to customers. These cost are associated with the adjustments of malfunctions after delivery of the product.

**17. Give the sub-elements of Preventive cost category?**

- i. Marketing/Customer/User
- ii. Product/Service/Design development
- iii. Purchasing
- iv. Operations/
- v. Quality Administration
- vi. Other Prevention Costs

**18. Give the sub-elements of Appraisal cost category?**

- i. Purchasing appraisal cost
- ii. Operations appraisal cost
- iii. External appraisal cost
- iv. Review of test and application data
- v. Miscellaneous quality evaluations

**19. Give the sub-elements of Internal failure cost category?**

- i. Product or Service Design costs (Internal)
- ii. Purchasing failure costs
- iii. Operations failure costs

**20. Give the sub-elements of External failure cost category?**

- i. Complaint investigations of customer or user service
- ii. Returned goods
- iii. Retrofit and recall costs
- iv. Warranty claims
- v. Liability costs
- vi. Penalties
- vii. Customer or user goodwill
- viii. Lost sales
- ix. Other external failure costs

**21. Give the typical cost bases?**

- i. Labor
- ii. Production

- iii. Unit
- iv. Sales

**22. How will you determine the optimum cost?**

- a. Make comparison with other organizations
- b. Optimize the individual categories
- c. Analyze the relationships among the cost categories

**16 MARKS**

1. Explain QFD with a suitable example. What are its advantages and Limitations.
2. Write short notes on:
  - (a) Taguchi's Quality Loss Function
  - (b) TPM
3. Explain quality costs. What are the barriers for implementing TQM in an industry? Explain.
4. What are the six major loss areas need to be measured for implementing TPM?
5. Discuss the QFD process with new chart and flow diagram.

**UNIT V QUALITY SYSTEMS**

**2marks**

**1. Give the ISO 9000 Series of Standards?**

- i. ISO 9000, "Quality Management and Quality Assurance Standards Guidelines for Selection and Use".
- ii. ISO 9001, "Quality Systems – Model for Quality Assurance in Design, Development, Production, Installation & Servicing".
- iii. ISO 9002, "Quality Systems – "Model for Quality Assurance in Production, Installation & Servicing".
- iv. ISO 9003, "Quality Systems – "Model for Quality Assurance in Final Inspection and Test".
- v. ISO 9004-1, "Quality Management and Quality System Elements – Guidelines".

**2. What is the need for ISO 9000?**

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.

**3. Give some other quality systems?**

The quality systems are

- i. QS-9000
- i. QS-9000
- ii. TE-9000
- iii. AS9000

**4. Enumerate the steps necessary to implement the Quality Management System?**

The steps necessary to implement the Quality Management System are

- i. Senior management commitment
- ii. Appoint the management representative
- iii. Awareness
- iv. Appoint an implementation team
- v. Training
- vi. Time schedule
- vii. Select element owners
- viii. Review the present system

- ix. Write the documents
- x. Install the new system
- xi. Internal audit
- xii. Management review
- xiii. Pre assessment
- xiv. Registration.

### **5. What are the three sections of QS-9000?**

The three sections of QS-9000 are

- i. Common requirements, which include the exact text of ISO 9001 and the addition of automotive/heavy trucking requirements.
- ii. Additional requirements covering production part approval process, continuous improvement and manufacturing capabilities.
- iii. Customer-specific requirements.

### **6. Give the objectives of the internal audit?**

The objectives of the internal audit

- 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.
- e) Cause the auditee to think about the process, thereby creating possible improvements.

### **7. What are the requirements of ISO 14001?**

The requirements of ISO 14001 are

- i. General requirements
- ii. Environmental policy
- iii. Planning
- iv. Implementation and operation
- v. Checking and corrective action
- vi. Management review

### **8. What are the benefits of ISO 14000?**

The benefits of ISO 14000 are

- a. Global
  - i. Facilitate trade and remove trade barriers
  - ii. Improve environmental performance of planet earth
  - iii. Build consensus that there is a need for environment management and a common terminology for EMS.
- b. Organizational

### **9. What are the four elements for the checking & corrective action of ISO 14001?**

- a) Monitoring and measuring
- b) Nonconformance and corrective and preventative action
- c) Records
- d) EMS audit

### **10. What are the seven elements for the implementation & operations of ISO 14001?**

- a) Structure and responsibility
- b) Training, awareness and competency
- c) Communication

- d) EMS documentation
- e) Documentation control
- f) Operational control
- g) Emergency preparedness and response

**11. What are the four elements for the planning of ISO 14001?**

- a) Environmental aspects
- b) Legal and other requirements
- c) Objectives and targets
- d) Environmental Management Programs

**12. Give the types of Organizational Evaluation Standards?**

- i. Environmental Management System
- ii. Environmental Auditing
- iii. Environmental Performance Evaluation

**13. Give the types of Product Evaluation Standards?**

- i. Environmental Aspects in Product Standards
- ii. Environmental Labeling
- iii. Life-Cycle Assessment

**14. Define Quality Audits?**

*Quality Audits* examine the elements of a quality management system in order to evaluate how well these elements comply with quality system requirements.

**15. Give the usage of an effective recognition and reward system?**

- l \_Serves as a continual reminder that the organization regards quality and productivity as important.
- l \_Offers the organization a visible technique to thank high achievers for outstanding performance.
- l \_Provides employees a specific goal to work toward. It motivates them to improve the process.
- l \_Boosts morale in the work environment by creating a healthy sense of competition among individuals and teams seeking recognition.

**16. What are the typical measurements frequently asked by managers and teams?**

- l \_Human Resource
- l \_Customers
- l \_Production
- l \_Research & Development
- l \_Suppliers
- l \_Marketing/Sales
- l \_Administration

**17.Explain the ISO/QS 9000 elements?**

- i. Management responsibility
- ii. The Quality system
- iii. Contract review
- iv. Design control
- v. Document and data control
- vi. Purchasing
- vii. Control of customer-supplied product
- viii. Product identification and traceability
- ix. Process control
- x. Inspection and testing
- xi. Control of inspection, measuring and test equipment

xii. Inspection and test status

**18. What are the benefits of ISO?**

- \_ Fewer on-site audit by customers.
- \_ Increased market share.
- \_ Improved quality, both internally and externally.
- \_ Improve product and service quality levels from suppliers.
- \_ Greater awareness of quality by employees.
- \_ A documented formal systems.
- \_ Reduced operating costs.

**19. Give the ISO 9001 requirements?**

- \_ Scope
- \_ Normative Reference
- \_ Terms and Definitions
- \_ Quality Management System
- \_ Management Responsibility
- \_ Resource Management
- \_ Product Realization

**20. What are the methods of actual audit?**

- i. Examination of documents
- ii. Observation of activities
- iii. Interviews

**16 MARKS**

1. Explain the steps to be followed in implementing quality system ISO 9001:2000
2. What are the requirements of ISO 14000? Explain them briefly.
3. Define quality system and explain the evaluation of ISO 9000.
4. Explain ISO 14000 with an Industrial application.
5. Explain the steps followed to get ISO 9000 certification for an educational institute.
6. What are the elements of ISO 9000:2000 quality system?
7. Explain in detail about the quality auditing with its different types.
8. Discuss in briefly about the documentation of quality system.
9. Discuss TQM implementation in manufacturing and service sectors including IT.