**AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**QUESTION BANK**

**DEPARTMENT: MECH SEMESTER: VII**

**SUBJECT CODE / Name: GE 2022 / TOTAL QUALITY MANAGEMENT**

**UNIT I INTRODUCTION**

**PART-A**

**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. 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.

**3. What do you mean by quality planning?**

The quality planning is strategy planning process in which quality is embedded in

each and every step.

**4. Where we use the quality planning road map?**

Quality planning can be applied for the following levels

1. Supervisory and worker level

2. Multi levels

3. functional levels

4. Major programming.

**5. Define TQM**

Total Quality Management is the management approach of an organization,

centered on quality, based on the participation of all its members and aiming

at long-term success through customer satisfaction and benefits to all members

of the organization and to society.

**6.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.

**7. What are the elements of TQM?**

The three elements of TQM are:

**1. The philosophical element**: It includes leadership continuous

Improvement, employee participation and development, design

Quality and prevention, partnership development, etc.

**2. The generic tools**: This includes SPC tools, QFD, new seven

Management tools and FMEA

**8. QC department**:

It consists of SQC methods, benchmarking, Taguchi methods, and TPM.

**9. 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.

**10. List out any four barriers to TQM implementation.**

The four barriers to TQM implementation are

1.Lack of management commitment.

2.Lack of employees commitment.

3.Lack of effective communication.

4.Lack of continuous training and education.

**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 do you mean by the term leadership?**

Leadership is the process pf influencing the activities of an individual or a group

towards the achievement of a goal in a given situation.

**13.List out the different leadership roles required for effective teamwork.**

The eight leadership roles are:

1.Producer role

2.Director role

3.Coordinator role

4.Checker role

5.Stimulator role

6.Mentor role

7.Innovator roles and

8.Negotiator role.

**14.What is a quality council? Who are all the members in the quality council?**

A quality council is a team to provide overall direction for achieving the total quality

culture.The members of quality council are

(i) The chief executive officer (CEO)

(ii) The senior managers of the different functional areas and

(iii) A coordinator or consultant.

**15.What is vision statement?**

The vision statement is a short declaration of what an organization aspires to be

Tomorrow

**16.What is mission statement?**

It is bound organizational goal, based on planning premises, which justifies an

organization existence.

**17.What is quality policy statement?**

The quality policy is a guide for everyone in the organization as to how they should

provide products and service to the customers.

**18.What is strategic planning?**

Strategic planning sets the long-term direction of the organization in which it wants

to proceed in future.

**19.What are the steps involved in strategic planning process?**

The strategic planning process involves seven basic steps. They are:

1.Customer needs

2.Customer positioning

3.Predict the future

4.Gap analysis

5.Closing the gap

6.Alignment and

7.Implementation

**20. What are the techniques commonly used for analyzing the quality cost?**

The techniques used for analyzing the quality cost are

1. Trend analysis and

2. Pareto analysis

**PART-B**

1. ( i) Describe t he s ix basic concepts o f TQM? (8)

(ii) Exp la in t he TQM framework and awareness. (8)

2. How do the dimensions of a quality of a product influence the acceptability? (16)

3 .What are t he characteristics of successful leaders (8)

4. W ha t a r e t he b e n e f i t s o f TQM? (8)

5. (i) . Explain the function of quality council. (6)

(ii).What is meant by strategic planning? Write t he seven steps procedure of strategic planning cycle (10)

6. (i) plain Juran’s ten steps to quality improvement (10)

(ii) Explain continuous process improvement (6)

7. ( i) Elaborate the Deming philosophy (8)

(ii)) Write short notes on leadership role s (8)

8 (i) Brief the history of evolution of TQM (10)

(ii) Explain the principles of TQM. (6)

9. Enumerate the Deming’s 14 points of management. (16)

10. Write engineering brief about the following terms: 1. Quality statement 2. Vision

Statement, 3. Mission statement and 4. Quality policy statement (16)

**UNIT II TQM PRINCIPLES**

**PART-A**

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

The customers inside the company are called internal customers, whereas the

customers outside the company a 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.Physilogical

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**

Achievement

* Recognition
* The work itself
* Responsibility
* Advancement and growth.

**Dissatisfier or hygiene factors**

* Supervisors
* Working conditions
* Interpersonal relationships
* Pay and security
* Company policy and administration

**9. Define empowerment.**

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 still 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 are the stages of team development?**

The six stages of team development are:

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

The three components of the Juran Trilogy are

i. Planning

ii. Control

iii. Improvement

**16. 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 Did n’t.

**17. 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

**18. What is 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.

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**19. 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.

**20. 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

**PART-B**

1. Explain the followings.

(i). 5 S. (5)

(ii). kaizen. (5)

(iii). Supplier rating and relationship development. (6)

2. (i). What are the customer perceptions of quality? (8)

(ii).What is team? Explain the different types of team? ` (8)

3. Explain how the employee will be involved in doing a process? (16)

4. Describe the various quality statements. (16)

5. Discuss about Maslow’s need hierarchy theory and Herzberg’s two factor theory for motivation. (16)

6. What are the seven steps of strategic planning? (16)

7. What are the principles of customer / supplier relations? (16)

8. Enumerate any eight actions that an organization shall take to handle complaints. (16)

9. Explain in detail about various methods used for obtaining customer feedback. (16)

10. What are the techniques commonly used for performance measures? (16)

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

**PART-A**

**1.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.

**2.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

**3.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.

**4.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 out 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?)

**5.What is the use of SPC?**

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

**6.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.?)

**7.Define cause and effect diagram.**

A cause and effect diagram is an analysis tool to display possible causes of a specific problem or condition. It is also called a fishbone diagram.

**8.What is scatter diagram?**

A scatter diagram is used to interpret data by graphically displaying the

relationship between two variables.

**9.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.

**10.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.

**11.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.

**12. 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.

**13. 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.

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

Steps in constructing an arrow diagram are,

a. Select a team that is knowledgeable about the project, its task and subtasks.

b. Record all of the tasks and subtasks necessary to the completion of the

project.

c. Sequence the tasks.

d. Assign a time duration to each task.

e. Calculate the shortest possible implementation time schedule using the

critical path method.

f. Calculate the earliest starting and finishing times for each task.

g. Locate tasks with slack (extra) time and calculate total slack.

h. Update the schedule as the project is being completed.

**15. 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. Define Statistics?**

Statistics is defined as the science that deals with the collection, tabulation,

analysis, interpretation, and presentation of quantitative data.

**17. 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.

**18. 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.

**19. 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.

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

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

**PART-B**

1. Explain the detail about the 7 SPC tools of quality. (16)

2. Explain the term “process capability”. (16)

3. Discuss in detail about the concept of Six-Sigma. (16)

4. List out the new 7 management tools and explain each one. (16)

5. Discuss briefly the various tools of statistical fundamentals. (16)

6. Explain the QC or SPC tools? (16)

7. Explain the Seven Management Tools? (16)

8. Plot the control chart for variables and attributes (16)

9. Explain the concepts of Six Sigma? (16)

10. Explain the different steps involved in FMEA with an examples. (16)

11. Problems in control charts and process capability. (16)

**UNIT IV TQM TOOLS & TECHNIQUES II**

**PART-A**

**1. what is benchmarking?**

Benchmarking is the process of identifying, understanding and adapting

outstanding practices and processes from organizations anywhere in the world to

an organization to improve its performance.

**2. What are the objectives for benchmarking?**

The objectives for benchmarking are

1. Benchmarking aims at a goal setting process to facilitate comparison with

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.

**3. What are the different types of benchmarking in relation to objects being**

**benchmarked?**

The different types of benchmarking in relation to objects being benchmarked are

1. Product benchmarking

2. Performance benchmarking

3. Process benchmarking and

4. Strategic benchmarking.

5. Relationship benchmarking

**4. 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 d evaluating the not-invented-here syndrome.

**5. 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.

**6. What are the benefits of QFD?**

The benefits of QFD are

i. Customer driven

ii. Reduces implementation time

iii. Promotes teamwork

iv. Provides documentation

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

The steps required to construct an affinity diagram are

i. Phrase the objective

ii. Record all responses

iii. Group the responses

iv. Organize groups in an affinity diagram

**8. What are the parts of house of quality?**

The parts of house of quality are

i. Customer requirements

ii. Prioritized customer requirements

iii. Technical descriptors

iv. Prioritized technical descriptors

v. Relationship between requirements and descriptors

vi. Interrelationship between technical descriptors

**9. How will you build a house of quality?**

a) List customer requirements

b) List technical descriptors

c) Develop a relationship matrix between WHATs and HOWs

d) Develop an interrelationship matrix between HOWs

e) Competitive assessments

f) Develop prioritized customer requirements

g) Develop prioritized technical descriptors

**10.Define FMEA?**

Failure Mode Effect Analysis is an analytical technique that combines the

technology and experience of people in identifying foreseeable failure modes of a

product or process and planning for its elimination.

**11. What are the stages of FMEA?**

The stages of FMEA are

**1. Specifying possibilities**

a. Functions

b. Possible failure modes

c. Root causes

d. Effects

e. Detection/Prevention

**2. Quantifying risk**

a. Probability of cause

b. Severity of effect

c. Effectiveness of control to prevent cause

d. Risk priority number

**3. Correcting high risk causes**

a. Prioritizing work

b. Detailed action

c. Assigning action responsibility

d. Check points on completion

**4. Revaluation of risk**

a. Recalculation of risk priority number

**12. What are the goals of TPM?**

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

i. Maintaining and improving equipment capacity

ii. Maintaining equipment for life

iii. Using support from all areas of the operation

iv. Encouraging input from all employees

v. Using teams for continuous improvement

**13. 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

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

The major loss areas are

i. Planned downtime

ii. Unplanned downtime

iii. Idling and minor stoppages

iv. Slow-downs

v. Process nonconformities

vi. Scrap

**PART-B**

1. Explain QFD with a suitable example. What are its advantages and Limitations? (16)

2. Write short notes on :( a) Taguchi’s Quality Loss Function (b) TPM (16)

3. Explain quality costs. What are the barriers for implementing TQM in an industry? (16)

4. What are the six major loss areas need to be measured for implementing TPM? (16)

5. Discuss the QFD process with new chart and flow diagram. (16)

6. Explain the seven step plan to establish TPM in an organization in detail. (16)

7. Explain the concepts of Taguchi’s Quality loss function in detail. Give an example(16)

8. Write down the step by step procedure for implementing a FMEA of a product of your interest. (16)

9. (i) Briefly explain the steps involved in QFD. (08)

(ii) Discuss the significance of TPM. (08)

10. Explain short notes on

(i) Benchmarking (08)

(ii) Total Productive Maintenance. (TPM) (08)

**UNIT V QUALITY SYSTEMS**

**PART-A**

**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?**

Serves as a continual reminder that the organization regards quality and

productivity as important.

Offers the organization a visible technique to thank high achievers for outstanding

performance.

Provides employees a specific goal to work toward. It motivates them to improve

the process.

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?**

Human Resource

Customers

Production

Research & Development

Suppliers

Marketing/Sales

Administration

**17. What are the criteria to evaluate the performance measures?**

Simple

Few in number

Developed by users

Relevance to customer

Improvement

Cost

Visible

Timely

Aligned

Results

**18. Give the usage of C&E diagrams?**

i.Analyze actual conditions for the purpose of product or service quality

improvement, more efficient use of resources, and reduced costs.

ii Eliminate conditions causing nonconformities and customer complaints.

iii Standardize existing and proposed operations.

Iv Educate and train personnel in decision-making and corrective-action

activities.

**19. Define Six Sigma?**

Six-Sigma is a business process that allows organizations to drastically improve

their bottom line by designing and monitoring every day business activities in ways

that minimize waste and resources while increasing customer satisfaction. It is

achieved through continuous process measurement, analysis & improvement.

**20. Differentiate Population & Sample?**

Population represents the mathematical world and Sample represents the real

world. A population frequency distribution is represented by a smooth curve

whereas a sample frequency distribution is represented by a histogram.

**PART-B**

1. Explain the steps to be followed in implementing quality system ISO 9001:2000 (16)

2. What are the requirements of ISO 14000? Explain them briefly. (16)

3. Define quality system and explain the evaluation of ISO 9000. (16)

4. Explain ISO 14000 with an Industrial application. (16)

5. Explain the steps followed to get ISO 9000 certification for an educational institute. (16)

6. What are the elements of ISO 9000:2000 quality system? (16)

7. Explain in detail about the quality auditing with its different types. (16)

8. Discuss in briefly about the documentation of quality system. (16)

9. Discuss TQM implementation in manufacturing and service sectors including IT (16)

10. (i) Explain the benefits of EMS.(8)

(ii).Discuss quality auditing in detail.(8)

11. Discuss the implementation of TQM with a case study from the manufacturing Industry.