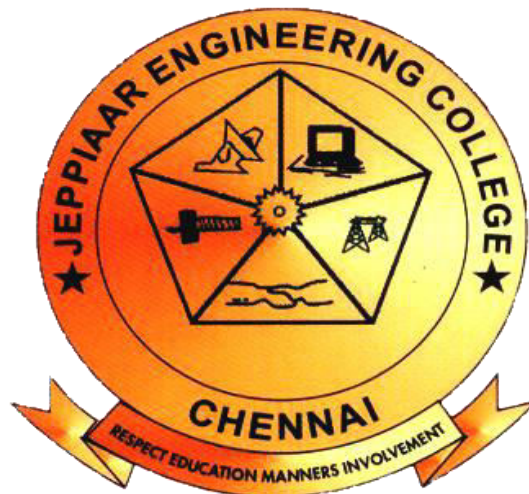


# **JEPPIAAR ENGINEERING COLLEGE**

Jeppiaar Nagar, Rajiv Gandhi Salai – 600 119

## **DEPARTMENT OF MECHANICAL ENGINEERING**

### **QUESTION BANK**



#### **VII SEMESTER**

**GE6757 – TOTAL QUALITY MANAGEMENT  
Regulation – 2013**

# JEPPIAAR ENGINEERING COLLEGE

## Vision of Institution

To build Jeppiaar Engineering College as an institution of academic excellence in technological and management education to become a world class university.

## Mission of Institution

- To excel in teaching and learning, research and innovation by promoting the principles of scientific analysis and creative thinking.
- To participate in the production, development and dissemination of knowledge and interact with national and international communities.
- To equip students with values, ethics and life skills needed to enrich their lives and enable them to meaningfully contribute to the progress of society.
- To prepare students for higher studies and lifelong learning, enrich them with the practical and entrepreneurial skills necessary to excel as future professionals and contribute to Nation's economy.

<b>PO1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
<b>PO4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
<b>PO6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
<b>PO7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**JEPPIAAR ENGINEERING COLLEGE**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

**Vision of the Department**

To create excellent professionals in the field of Mechanical Engineering and to uplift the quality of technical education on par with the International Standards.

**Department Mission**

1. **To reinforce** the fundamentals of Science and Mathematics to **Mechanical Engineering and critically and relatively investigate** complex **mechanical systems and processes**.
2. To engage in the **production, expansion and practice** of **advanced engineering applications** through knowledge sharing activities by interacting with global communities and industries.
3. To **equip** students with **engineering ethics, professional roles, corporate social responsibility** and life skills and **apply** them for the betterment of society.
4. **To promote** higher studies and lifelong learning and entrepreneurial skills and **develop** excellent professionals for empowering nation's economy.

**PEO's**

1. To **enrich** the technical knowledge of **design, manufacturing and management of mechanical systems** and **develop creative and analytical thinking** in research.
2. To **relate, strengthen and develop** the **theoretical knowledge of the Mechanical Engineering** by exhibiting various concepts applied through diverse industrial exposures and experts' guidance.
3. **Facilitate** the students to communicate effectively on complex social, professional and engineering activities with strict adherence to ethical principles.
4. **Create awareness for independent and life long learning and develop the ability to keep abreast of modern trends and adopt them for personal technological growth of the nation.**

**PSO's**

1. To understand the basic concept of various mechanical engineering field such as design, manufacturing, thermal and industrial engineering.
2. To apply the knowledge in advanced mechanical system and processes by using design and analysis techniques.
3. To develop student's professional skills to meet the industry requirements and entrepreneurial skills for improving nation's economy stronger.

# GE6757 – TOTAL QUALITY MANAGEMENT

## COURSE OUTCOMES

C404.1	outline the basic and importance of quality, management and customer in an organisation
C404.2	explain the tqm principles , employee related activities and show the prominent status of 5s, kaizen, and supplier relationship
C404.3	explain and classify the quality tools, six sigma, and create FMEA chart for IT and manufacturing applications
C404.4	Create awareness of statistical techniques and show the required improvements with measuring of its performance.
C404.5	summarize the quality standards and apply the TQM concept in manufacturing field

## **GE6757 TOTAL QUALITY MANAGEMENT**

**OBJECTIVES: To facilitate the understanding of Quality Management principles and process.**

### **UNIT I INTRODUCTION 9**

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product-and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

### **UNIT II TQM PRINCIPLES 9**

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation,

Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

### **UNIT III TQM TOOLS AND TECHNIQUES I 9**

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 AND TECHNIQUES II 9**

Control Charts - Process Capability - Concepts of Six Sigma - Quality Function Development (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

### **UNIT V QUALITY SYSTEMS 9**

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors..

TOTAL: 45 PERIODS

**OUTCOMES:** The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

#### **TEXT BOOK:**

1. Dale H. Besterfield, et al., "Total quality Management", Third Edition, Pearson Education Asia, Indian Reprint, 2006.

#### **REFERENCES:**

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012.
2. Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
3. Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.



# JEPPIAAR ENGINEERING COLLEGE

Jeppiaar Nagar, Rajiv Gandhi Salai – 600 119

**DEPARTMENT OF MECHANICAL ENGINEERING**

## QUESTION BANK

Subject : **GE6757 TOTAL QUALITY MANAGEMENT**

Year / Sem : IV / VII

### UNIT I- INTRODUCTION

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product-and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

#### PART-A

#### CO Mapping : C704.1

Q.No.	Questions	BT Level	Competence	PO
1	What are the different ways to create customer oriented culture in an industry?	BTL-1	Remembering	PO1
2	Identify the categories of quality cost?	BTL-3	Applying	PO5
3	Define Quality.	BTL-1	Remembering	PO3
4	Define Total Quality Management	BTL-1	Remembering	PO9
5	List the basic features of TQM	BTL-1	Remembering	P10
6	What are the major benefits of TQM?	BTL-1	Remembering	P11
7	What are some major obstacles or Barriers to TQM implementation?	BTL-1	Remembering	PO4
8	List the four pillars of TQM?	BTL-1	Remembering	PO1
9	What is Zero Defects?	BTL-1	Remembering	PO6
10	What is quality habit?	BTL-5	Evaluating	PO1
11	What are the seven deadly diseases?	BTL-1	Remembering	PO2
12	What is quality according to Juran& Deming?	BTL-1	Remembering	PO4
13	What is quality control?	BTL-1	Remembering	PO3
14	How can quality are quantified.	BTL-1	Remembering	PO5
15	What is TQM triangle?	BTL-1	Remembering	PO5
16	What is Deming Cycle (or) what PDSA cycle is?	BTL-1	Remembering	PO5
17	What are the measure dimensions of service quality?	BTL-1	Remembering	PO6
18	What is meant by SQC?	BTL-1	Remembering	PO6
19	What is meant by TQCand QA?	BTL-1	Remembering	PO10
20	Define TQM as a part of competitive strategy.	BTL-1	Remembering	P11

21	Define Quality Cost	<b>BTL-1</b>	Remembering	<b>PO5</b>
22	Compare quality requirements before and after TQM	<b>BTL-2</b>	Understanding	<b>PO3</b>
23	Define Total Quality?	<b>BTL-1</b>	Remembering	<b>PO1</b>
24	List the Basic Concepts of TQM?	<b>BTL-1</b>	Remembering	<b>PO5</b>
25	List the Principles of TQM?	<b>BTL-1</b>	Remembering	<b>PO2</b>
26	List the Obstacles associated with TQM Implementation?	<b>BTL-1</b>	Remembering	<b>PO1</b>
27	What are the Dimensions of Quality?	<b>BTL-1</b>	Remembering	<b>PO1</b>
28	Discuss the Quality Improvement Strategy?	<b>BTL-6</b>	Creating	<b>PO5</b>
29	What does a typical meeting agenda contain after establishing the TQM?	<b>BTL-1</b>	Remembering	<b>PO6</b>
30	What are the various quality statements?	<b>BTL-1</b>	Remembering	<b>PO4</b>
<b>PART-B&amp;PART-C</b>				
1	Explain the dimensions of quality	<b>BTL-2</b>	Understanding	<b>PO1</b>
2	Determine and explain the barriers to TQM implementation in an organization	<b>BTL-5, BTL-2</b>	Evaluating, Understanding	<b>PO2</b>
3	Explain the basic concepts of TQM in detail.	<b>BTL-2</b>	Understanding	<b>PO4</b>
4	Explain the concepts evolution and benefits of TQM principles.	<b>BTL-2</b>	Understanding	<b>PO1</b>
5	Define Deming Philosophy and 14 points for improvement of quality management.	<b>BTL-1</b>	Remembering	<b>PO1,PO3</b>
6	i. Explain in detail Juran's Trilogy. ii. Discuss the contribution of Juran for quality in detail	<b>BTL-2, BTL-6</b>	Understanding, Creating	<b>PO6</b>
7	i.Explain the role of senior level management in TQM implementation? ii.Illustrate the various steps involved in customer satisfaction process?	<b>BTL-2</b>	Understanding	<b>PO3,PO1</b>

## UNIT II TQM PRINCIPLES

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

### PART-A

#### CO Mapping : C704.2

Q.No.	Questions	BT Level	Competence	PO
1	What are the requirements of reliable supplier rating?	<b>BTL-1</b>	Remembering	<b>PO1</b>
2	How employee involvement improved in an organization?	<b>BTL-1</b>	Remembering	<b>PO5</b>
3	Why should suppliers be treated as partners	<b>BTL-1</b>	Remembering	<b>PO3</b>
4	What is the 'Juran Trilogy' ('Quality Trilogy')	<b>BTL-1</b>	Remembering	<b>PO9</b>

5	What are the four categories of quality costs?	<b>BTL-1</b>	Remembering	<b>P10</b>
6	What are Quality Circles (QC)?	<b>BTL-1</b>	Remembering	<b>P11</b>
7	What are the roles assigned to people in Quality Circles or who constitutes QC.	<b>BTL-1</b>	Remembering	<b>PO4</b>
8	What is meant by empowerment?	<b>BTL-2</b>	Understanding	<b>PO1</b>
9	What are the Japanese 5S principles?	<b>BTL-2</b>	Understanding	<b>PO5</b>
10	What are the various quality statements? Write an example for quality statement.	<b>BTL-1</b>	Remembering	<b>PO1</b>
11	What is a Vision statement?	<b>BTL-1</b>	Remembering	<b>PO2</b>
12	What is a Mission statement?	<b>BTL-1</b>	Remembering	<b>PO4</b>
13	Distinguish between 'internal customer' and 'external customer'	<b>BTL-4</b>	Analyzing	<b>PO3</b>
14	What is importance of customer retention?	<b>BTL-1</b>	Remembering	<b>PO5</b>
15	List some benefits of implementing 5S principles	<b>BTL-1</b>	Remembering	<b>PO5</b>
16	Explain Kaizen	<b>BTL-2</b>	Understanding	<b>PO5</b>
17	What do you understand by Supplier Rating?	<b>BTL-1</b>	Remembering	<b>PO6</b>
18	Distinguish between Reward and Recognition	<b>BTL-4</b>	Analyzing	<b>PO6</b>
19	What is the importance of customer focus for an organization?	<b>BTL-1</b>	Remembering	<b>PO10</b>
20	List the benefits of Team work	<b>BTL-1</b>	Remembering	<b>P11</b>
21	What are the traits of successful leaders?	<b>BTL-1</b>	Remembering	<b>PO5</b>
22	What is strategic quality planning?	<b>BTL-1</b>	Remembering	<b>PO3</b>
23	What is needed for a leader to be effective?	<b>BTL-1</b>	Remembering	<b>PO1</b>
24	What is the important role of senior management?	<b>BTL-1</b>	Remembering	<b>PO5</b>
25	What are the general duties of a quality council?	<b>BTL-1</b>	Remembering	<b>PO2</b>
26	What is a quality policy?	<b>BTL-1</b>	Remembering	<b>PO1</b>
27	Define Empowerment?	<b>BTL-1</b>	Remembering	<b>PO1</b>
28	What are the types of teams?	<b>BTL-1</b>	Remembering	<b>PO5</b>
29	What are the phases of a Continuous Process Improvement Cycle?	<b>BTL-1</b>	Remembering	<b>PO6</b>
30	What are the objectives of Performance measures?	<b>BTL-1</b>	Remembering	<b>PO4</b>
<b>Q.No.</b>	<b>Questions</b>	<b>BT Level</b>	<b>Competence</b>	<b>PO1</b>
<b>PART-B&amp;PART-C</b>				
1	i.Explain the step by step procedure in strategic quality planning? ii.What is supplier partnering? And explain its benefits?	<b>BTL-2, BTL-1</b>	Understanding, Remembering	<b>PO3</b>



2	What do you mean by customer satisfaction? Explain a customer satisfaction model	<b>BTL-1</b>	Remembering	<b>PO9</b>
3	Explain all the elements in 5'S principle and also the implementation procedure of 5'S in a manufacturing company.	<b>BTL-2</b>	Understanding	<b>P10</b>
4	Explain in detail the concept of employee involvement and motivation for enhancing quality	<b>BTL-2</b>	Understanding	<b>P11</b>
5	Explain in detail about Performance Appraisal. What are its benefits?	<b>BTL-2</b>	Understanding	<b>PO4</b>
6	i. Explain the issues related to customer complaints and retention. ii. What are the various avenues of measuring customer satisfaction? Give examples.	<b>BTL-2,</b> <b>BTL-1</b>	Understanding, Remembering	<b>PO1</b>
7	How is PDSA cycle practiced?	<b>BTL-1</b>	Remembering	<b>PO5</b>

### **UNIT III TQM TOOLS AND 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..

#### **PART-A**

#### **CO Mapping : C704.3**

<b>Q.No.</b>	<b>Questions</b>	<b>BT Level</b>	<b>Competence</b>	<b>PO5</b>
1	What are the different ways of benchmarking?	<b>BTL-1</b>	Remembering	<b>PO5</b>
2	How cause and effect diagram used in TQM?	<b>BTL-1</b>	Remembering	<b>PO5</b>
3	List the seven tools of quality/Elemental Statistical Tools.	<b>BTL-1</b>	Remembering	<b>PO6</b>
4	What is check sheet?	<b>BTL-1</b>	Remembering	<b>PO6</b>
5	What is six sigma?	<b>BTL-1</b>	Remembering	<b>PO10</b>
6	What is histogram? And its types.	<b>BTL-1</b>	Remembering	<b>P11</b>
7	What is process capability?	<b>BTL-1</b>	Remembering	<b>PO5</b>
8	What is cause and effect diagram.	<b>BTL-1</b>	Remembering	<b>PO3</b>
9	What are the measure benefits of six sigma?	<b>BTL-1</b>	Remembering	<b>PO1</b>
10	What is Pareto diagram?	<b>BTL-1</b>	Remembering	<b>PO5</b>
11	What is scatter diagram?	<b>BTL-1</b>	Remembering	<b>PO2</b>
12	When do you use the scatter diagram?	<b>BTL-1</b>	Remembering	<b>PO1</b>
13	What is control chart? What are the types of control charts?	<b>BTL-1</b>	Remembering	<b>PO1</b>
14	When do you use control chart.	<b>BTL-1</b>	Remembering	<b>PO5</b>
15	Define statistics applications of statistical	<b>BTL-1</b>	Remembering	<b>PO6</b>

	techniques.			
16	Distinguish between producer's risk and consumer's risk.	<b>BTL-4</b>	Analyzing	<b>PO4</b>
17	What is Risk Prioritization Number?	<b>BTL-1</b>	Remembering	<b>PO1</b>
18	What is Benchmarking?	<b>BTL-1</b>	Remembering	<b>PO5</b>
19	List down 7 new QC Tool.	<b>BTL-1</b>	Remembering	<b>PO3</b>
20	Explain the stages of FMEA.	<b>BTL-2</b>	Understanding	<b>PO9</b>
21	What are the reasons for bench marking?	<b>BTL-1</b>	Remembering	<b>P10</b>
22	List down the six symbols used in a flowchart	<b>BTL-1</b>	Remembering	<b>P11</b>
23	Define Six Sigma Problem Solving Method?	<b>BTL-1</b>	Remembering	<b>PO4</b>
24	What are the new seven management tools?	<b>BTL-1</b>	Remembering	<b>PO1</b>
25	List the seven tools of quality?	<b>BTL-1</b>	Remembering	<b>PO5</b>
26	Name the steps to benchmark?	<b>BTL-1</b>	Remembering	<b>PO1</b>
27	What are the steps required to construct an affinity diagram?	<b>BTL-1</b>	Remembering	<b>PO2</b>
28	What are the types of benchmarking?	<b>BTL-1</b>	Remembering	<b>PO4</b>
29	What are five standard formats of matrix diagram?	<b>BTL-1</b>	Remembering	<b>PO3</b>
30	What are the various patterns of scatter diagrams?	<b>BTL-1</b>	Remembering	<b>PO5</b>

**PART-B & PART-C**

<b>Q.No.</b>	<b>Questions</b>	<b>BT Level</b>	<b>Competence</b>	<b>PO</b>
1	Explain seven traditional tools for quality of TQM.	<b>BTL-2</b>	Understanding	<b>PO5</b>
2	Explain six sigma concepts with an example.	<b>BTL-2</b>	Understanding	<b>PO5</b>
3	Explain bench marking and its steps with an example.	<b>BTL-2</b>	Understanding	<b>PO5,PO1</b>
4	Explain new seven TQM tools.	<b>BTL-2</b>	Understanding	<b>PO5</b>
5	Explain the failure mode and effect analysis	<b>BTL-2</b>	Understanding	<b>PO5,PO1</b>
6	Develop procedure for implementation of SIX sigma in a manufacturing organization	<b>BTL-6</b>	Creating	<b>PO1,PO5,PO9</b>

**UNIT IV TQM TOOLS AND TECHNIQUES II**

Control Charts - Process Capability - Concepts of Six Sigma - Quality Function Development (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

**PART-A**

**CO Mapping : C704.4**

<b>Q.No.</b>	<b>Questions</b>	<b>BT</b>	<b>Competence</b>	<b>PO</b>
--------------	------------------	-----------	-------------------	-----------

		<b>Level</b>		
1	Write the specific uses of np-chart?	<b>BTL-1</b>	Remembering	<b>PO5</b>
2	Define process capability index?	<b>BTL-1</b>	Remembering	<b>PO5</b>
3	What are quality circle and its structure?	<b>BTL-1</b>	Remembering	<b>PO3</b>
4	What is the essential feature of Total Productive Maintenance?	<b>BTL-1</b>	Remembering	<b>PO5</b>
5	What are the overall goals of TPM?	<b>BTL-1</b>	Remembering	<b>PO1</b>
6	What is meant by house of quality?	<b>BTL-1</b>	Remembering	<b>PO1</b>
7	What are the eight pillars of TPM?	<b>BTL-1</b>	Remembering	<b>PO4</b>
8	What are the three categories of losses identified in TPM?	<b>BTL-1</b>	Remembering	<b>PO1</b>
9	What is Business Process Reengineering (BPR)?	<b>BTL-1</b>	Remembering	<b>PO5</b>
10	What is Taguchi's Loss function? (TQLF)	<b>BTL-1</b>	Remembering	<b>PO1</b>
11	What is Taguchi's definition of quality.	<b>BTL-1</b>	Remembering	<b>PO5</b>
12	What is voice of customer (VOC)?	<b>BTL-1</b>	Remembering	<b>PO5</b>
13	What are the four categories of quality costs?	<b>BTL-1</b>	Remembering	<b>PO3</b>
14	What are internal failure costs and external failure costs?	<b>BTL-1</b>	Remembering	<b>PO5</b>
15	What are the performance measures of TQM?	<b>BTL-1</b>	Remembering	<b>PO5</b>
16	What is QFD?	<b>BTL-1</b>	Remembering	<b>PO5</b>
17	What is Poka Yoke?	<b>BTL-1</b>	Remembering	<b>PO6</b>
18	Define TPM.	<b>BTL-1</b>	Remembering	<b>PO6</b>
19	Explain the types of benchmarking.	<b>BTL-2</b>	Understanding	<b>PO10</b>
20	Classify the different parameters used for quality performance measurement.	<b>BTL-2</b>	Understanding	<b>PO1</b>
21	What sparked the interest of Indian Manufactures in quality circles?	<b>BTL-1</b>	Remembering	<b>PO5</b>
22	What is the importance of Taguchi's quality loss function (TQLF)?	<b>BTL-1</b>	Remembering	<b>PO5</b>
23	Define Control chart?	<b>BTL-1</b>	Remembering	<b>PO5</b>
24	What are the parts of house of quality?	<b>BTL-1</b>	Remembering	<b>PO5</b>
25	How will you build a house of quality?	<b>BTL-1</b>	Remembering	<b>PO5</b>
26	What are the goals of TPM?	<b>BTL-1</b>	Remembering	<b>PO1</b>
27	List the seven basic steps to get an organization started toward TPM?	<b>BTL-1</b>	Remembering	<b>PO1</b>
28	What are the benefits of QFD?	<b>BTL-1</b>	Remembering	<b>PO5</b>
29	What are the objectives of Performance measures?	<b>BTL-1</b>	Remembering	<b>PO6</b>
30	List the six basic techniques for presenting performance measures?	<b>BTL-1</b>	Remembering	<b>PO4</b>
<b>PART-B&amp; PART-C</b>				
1	Explain about Taguchi's Quality Loss Function.	<b>BTL-2</b>	Understanding	<b>PO9, PO5, PO1</b>
2	Explain the basic steps involved in QFD	<b>BTL-2</b>	Understanding	<b>PO5</b>

3	Explain each section of the basic structures of house of quality by selecting a suitable product	<b>BTL-2</b>	Understanding	<b>PO1,P O5</b>
4	Explain the types and the analysis techniques of cost of quality	<b>BTL-2</b>	Understanding	<b>PO5, PO1</b>
5	What is mean by QFD and draw QFD methodology and explain	<b>BTL-1</b>	Remembering	<b>PO5</b>
6	Explain in detail the performance measures used in evaluating an organisation/manufacturing industries	<b>BTL-2</b>	Understanding	<b>PO1, PO5</b>
7	i. Explain the stages involved in TPM. ii. Define quality chart and explain it clearly	<b>BTL-2, BTL-1</b>	Understanding ,Remembering	<b>PO3, PO5</b>

### **UNIT V QUALITY SYSTEMS**

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

#### **PART-A**

#### **CO Mapping : C704.5**

<b>Q.No.</b>	<b>Questions</b>	<b>BT Level</b>	<b>Competence</b>	<b>PO</b>
1	Name any two generic ISO standards?	<b>BTL-1</b>	Remembering	<b>PO5</b>
2	What are the core elements of QMS?	<b>BTL-1</b>	Remembering	<b>PO5</b>
3	What are the general requirements of quality management system?	<b>BTL-1</b>	Remembering	<b>PO3</b>
4	What are ISO 9000 standards or Objectives of ISO 9000 quality standards?	<b>BTL-1</b>	Remembering	<b>PO5</b>
5	List any five elements of ISO 9000.	<b>BTL-1</b>	Remembering	<b>PO1</b>
6	Explain the management's responsibility for ISO.	<b>BTL-2</b>	Understanding	<b>PO1</b>
7	Illustrate the documentation pyramid.	<b>BTL-2</b>	Understanding	<b>PO4</b>
8	Define quality system audit.	<b>BTL-1</b>	Remembering	<b>PO1</b>
9	What are the different types of audit?	<b>BTL-1</b>	Remembering	<b>PO5</b>
10	What are the different stages in conducting quality audit?	<b>BTL-1</b>	Remembering	<b>PO1</b>
11	What are the documentation requirements of quality management systems?	<b>BTL-1</b>	Remembering	<b>PO5</b>
12	What is quality manual?	<b>BTL-1</b>	Remembering	<b>PO5</b>
13	What is the need for ISO standards?	<b>BTL-1</b>	Remembering	<b>PO3</b>
14	What is third party audit?	<b>BTL-1</b>	Remembering	<b>PO5</b>
15	What are the objectives of internal audit.	<b>BTL-1</b>	Remembering	<b>PO5</b>
16	What is Environment Management Systems Standards?	<b>BTL-1</b>	Remembering	<b>PO5</b>
17	What are the benefits of ISO 14001?	<b>BTL-1</b>	Remembering	<b>PO6</b>
18	What is QS 9000 and who have developed the system.	<b>BTL-1</b>	Remembering	<b>PO6</b>
19	List the various clauses of ISO 9001-2000 standards?	<b>BTL-1</b>	Remembering	<b>PO10</b>

20	Compare QS 9000 with TS 16949 quality systems.	<b>BTL-5</b>	Evaluating	<b>PO1</b>
21	What are the items covered by ISO 9000 regarding quality?	<b>BTL-1</b>	Remembering	<b>PO5</b>
22	Discuss short notes on ISO Certification.	<b>BTL-6</b>	Creating	<b>PO5</b>
23	What is the need for ISO 9000?	<b>BTL-1</b>	Remembering	<b>PO5</b>
24	What are the objectives of the internal audit?	<b>BTL-1</b>	Remembering	<b>PO5</b>
25	What are the requirements of ISO 14001?	<b>BTL-1</b>	Remembering	<b>PO5</b>
26	List the ISO 9001 requirements?	<b>BTL-1</b>	Remembering	<b>PO1</b>
27	What are the benefits of ISO?	<b>BTL-1</b>	Remembering	<b>PO1</b>
28	What are the methods of actual audit?	<b>BTL-1</b>	Remembering	<b>PO5</b>
29	Define Quality Audits?	<b>BTL-1</b>	Remembering	<b>PO6</b>
30	What are the benefits of TQM implementation?	<b>BTL-1</b>	Remembering	<b>PO4</b>

**PART-B& PART-C**

1	Explain the elements and implementation of ISO 9001.	<b>BTL-2</b>	Understanding	<b>PO5, PO6, PO7</b>
2	Explain the features and procedures to obtain ISO 14000 environmental certification	<b>BTL-2</b>	Understanding	<b>PO5, PO6, PO7</b>
3	a) Discuss about four important documents to be prepared for ISO 9000 certification. b) What are the benefits of implementing ISO 14000 standards.	<b>BTL-6, BTL-2</b>	Creating , Understanding	<b>PO5, PO6, PO7</b>
4	Explain the Documentation, Quality auditing, benefits of ISO 9000.	<b>BTL-2</b>	Understanding	<b>PO5, PO6, PO7</b>
5	Discuss the implementation requirements of ISO standards to IT industries/service sectors and airline industry	<b>BTL-6</b>	Creating	<b>PO5, PO6, PO7</b>
6	What are the need for documentation, Quality auditing, elements in QMS	<b>BTL-1</b>	Remembering	<b>PO5, PO6, PO7</b>
7	What are the origins of QS-9000? Why was it developed despite of the presence of ISO 9000?	<b>BTL-1</b>	Remembering	<b>PO9</b>

**UNIT I INTRODUCTION**

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product-and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

**PART-A**

**1. What are the different ways to create customer oriented culture in an industry? (NOV/DEC 2016)**

A customer-oriented organization places customer satisfaction at the core of each of its business decisions. Customer orientation is defined as an approach to sales and customer-relations in which staff focus on helping customers to meet their long-term needs and wants.

1. Start at the top
2. Hire people who fit
3. Get everyone involved
4. Trust your team
5. Establish good lines of communication

**2. Write on the categories of quality cost? (NOV/DEC 2016)**

The cost of quality is generally classified into four categories:

1. External Failure Cost
2. Internal Failure Cost
3. Inspection (appraisal) Cost
4. Prevention Cost

**3. Define Quality. (Apr/May 2012, May/June 2014, Apr/May 2015)**

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. Thus Quality is termed as the conformance that assures the customer the right quality / specifications of the product that it intends to provide functionally with good reliability and after service

**4. Define Total Quality Management. (Nov/Dec 2011, Nov/Dec 2013, Apr/May 2015)**

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).TQM aims at reducing the input costs; increases profit and return on investment by improving the quality and productivity thereby usher the company or organisation to stay in business

**5. Mention the basic features of TQM. (May/Jun 2013)**

Management commitment; focus on customer (both external and internal); employee involvement, empowerment; continuous improvement; treating suppliers as partners and establish performance measures for processes

**6. What are the major benefits of TQM? (Nov/Dec 2011)**

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

**7. What are some major obstacles or Barriers to TQM implementation? (Apr/May 2012,2015)**

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.

**8. Mention the four pillars of TQM?**

Customer Satisfaction; Continuous Improvement, Quality Leadership and Systems Approach are the four main pillars of TQM.

**9.What is Zero Defects?**

Zero Defects [is] a management tool aimed at the reduction of defects through prevention. It is directed at motivating people to prevent mistakes by developing a constant, conscious desire to do their job right the first time. Do it right the first time cost effectively, quality consciously and safety consciously is the mantra of today's, manufacturing system.

**10.What is quality habit? (May/Jun 2011)**

Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilful execution; it represents the wise choice of many alternatives. It is a standard practice that must be followed effortlessly thereby achieving customer satisfaction and building trust and relationship with them.

**11. What are the seven deadly diseases?**

The seven deadly diseases identified in an organisation that spoils the quality function are listed below; 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

**12. What is quality according to Juran& Deming? (Nov/Dec 2012, Nov/Dec 2015)**

**Juran defines** quality as fitness for use in terms of design, conformance, availability, safety and field use. And this should be religiously practiced and followed across the organisation from production to aftermarket sales (service).

**Deming defines** that quality is a predictable degree of uniformity and dependability, at low cost and suited to the market

**13. What is quality control?**

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. It is a measure on the existing quality to evaluate the consistency of achieving the right quality at all times.

**14. How can quality are quantified.**

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 Where, P-Performance and E-Expectations and Q-Quality Index

**15. What is TQM triangle?**

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. What is Deming Cycle (or) what PDSA cycle is?**

P-D-S-A (Plan-Do-Study-Act) is a cycle of continuous improvement. Decide upon the type of quality problem to analyze and act upon with concrete solutions to the same in eliminating the quality problem from the process or product or services offered to the customer.

**17. What are the measure dimensions of service quality? (Nov/Dec 2013, May/Jun 2013)**

The aftermarket sales as referred to as Service to customer are of prime importance to business sustainability. The following ideologies helps in achieving the above said and they are Service duration, Timeliness, Completeness, Consistency, Convenience, Accuracy, Courtesy, etc.

**18. What is meant by SQC?**

SQC stands for Statistical quality control. It is used to measure the degree of conformance of raw materials, processes and products to previously agreed specifications/standards.

**19. What is meant by TQC and QA?**

TQC stands for total quality control. TQC is the continuous process for improvement where current standards present the opportunity for the achievement of new and higher targets for improvement. This is a business philosophy that provides reliability and consistency in the delivered products/services as a check and balance system. QA stands for Quality Assurance. QA means basically the quality control is conducted in a systematic manner. It is a planned and systematic actions required to provide adequate confidence that the product or service will comply with the set standards or specification which was previously agreed upon.

**20. Define TQM as a part of competitive strategy.**

Value = (Quality/Price). So the Customer plays an important role in determining or assessing the worthiness of the product/service and the value changes with time. Value is inversely proportional to the price criteria and economics deals it with the term so called market capitalization or Brand acquisition.

**21. Define Quality Cost**

Quality costs are those costs associated with the non-achievement of product/service quality defined by the requirements established the organisation / customer or society. Trend analysis and Pareto analysis are used for analyzing the quality cost

**22. Compare quality requirements before and after TQM (Nov/Dec 2015)**

Quality Requirements Before TQM	Quality Requirements After TQM
Product oriented	Customer oriented
Short term decisions	Long term decisions
Emphasis on detection	Emphasis on prevention
Errors based on operations	Errors based on systems

**23. Define Total Quality? (A.U/APRIL/MAY2008)**

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.

**24. Give the Basic Concepts of TQM? (APRIL/MAY2008)**

A committed and involved management to provide long-term top-to-bottom organizational support. An unwavering focuses on the customer, both internally and externally. Effective involvement and utilization of the entire work force. Continuous improvement of the business and production measures for the processes.

**25. Give the Principles of TQM? (A.U/NOV/DEC2007)**

- Constancy of purpose: short range and long range objectives aligned
- Identify the customer(s); Customer orientation
- Identification of internal and external customers
- Continuous improvement
- Workflow as customer transactions

- To improve worker safety.

**26. Give the Obstacles associated with TQM Implementation? (A.U/APRIL/MAY/08)**

Lack of management commitment  
 Inability to change organizational culture  
 Improper planning  
 Lack of continuous training and education  
 Ineffective measurement techniques and lack of access to data and results.  
 Paying inadequate attention to internal and external customers.  
 Inadequate use of empowerment and teamwork.

**27. What are the Dimensions of Quality? (A.U/NOV/DEC2007)**

Features : Conformance, Reliability, Durability, Service, Response, Aesthetics, Reputation

**28. State the Quality Improvement Strategy? (A.U/NOV/DEC 2007)**

Reduce failure costs by problem solving. Reduce appraisal costs where appropriate and in a statistically sound manner. Continuously evaluate and redirect

**29. What does a typical meeting agenda contain after establishing the TQM? (A.U/APRIL/MAY2008)**

- ii) Customer satisfaction report
- iii) Progress on meeting goals
- iv) New project teams
- v) Recognition dinner
- vi) Benchmarking report

**30. What are the various quality statements?**

- \* Vision Statement
- \* Mission Statement
- \* Quality Policy Statement

**PART-B**

**1. Explain the dimensions of quality. (Nov/Dec 2011), (Nov/Dec 2016)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**2. State and explain the barriers to TQM implementation in an organization. (Nov/Dec 2012, 2015)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**3. Explain the basic concepts of TQM in detail. (Nov/Dec 2013, Nov/Dec 2015)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**4. Explain the concepts evolution and benefits of TQM principles. (May/Jun 2009),(Nov/Dec 2016)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**5. Define Deming Philosophy and 14 points for improvement of quality management. (Nov/Dec 2014, Apr/May 2015)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**6. i. Explain in detail Juran's Trilogy. (May/Jun 2014)**

**ii. Discuss the contribution of Juran for quality in detail (Nov/Dec 2015)**



Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9

**7. I.Explain the role of senior leavel management in TQM implementation? (Nov/Dec 2016)**

**ii.Illustrate the various steps involved in customer satisfaction process? (Nov/Dec 2016)**

Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9

## UNIT II TQM PRINCIPLES

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

### PART-A

**1. Write the requirements of reliable supplier rating? (NOV/DEC 2016)**

1. Establish Performance Indicators
2. Classify Multiple Suppliers and Vendors
3. Devise an Evaluation Method
4. Determine Who's Calling the Shots

**2. How employee involvement improved in an organization? (NOV/DEC 2016)**

- 1.Management Involvement
2. Positive Feedback
3. Employee Suggestion Program
4. Correlate the Facility Performance to the "End Goal"
- 5.Performance Based Economic Incentives

**3. Why should suppliers be treated as partners. (Nov/Dec 2014)**

Yes, suppliers are to be treated as partners from business point of view. The 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. It should be a win-win strategy for both the supplier and producer.

**4. What is the 'Juran Trilogy' ('Quality Trilogy') (Nov/Dec 2011)**

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

**5. What are the four categories of quality costs?**

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

**6. What are Quality Circles (QC)?**

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 or who constitutes QC. (May/Jun 2014)**

The QC organization has a four-tier structure (roles and responsibilities) consisting of Members, Leaders, Facilitators, and Steering Committee. Usually the line operator will be the head of the QC team. This is one of the important aspect to be followed in an organisation marching towards Deming quality medal award.

**8.What is meant by empowerment? (Nov/Dec 2012)**

Empowerment means entrusting people with authority and responsibility. The real meaning of empowering people implies making decisions as and when required independently. Decisions should adhere to the policy laid down by the company and in no way deviate from the directions or principles set by the management.

**9. What are the Japanese 5S principles? (Nov/Dec 2011)**

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. 5S converts and organisation into a safe, clean, unambiguous and energized work environment, 5S can be followed in Office, manufacturing line, hospitals and everywhere so that hassle free work environment can be created.

**10. What are the various quality statements? Write an example for quality statement. (May/Jun 2014)**

The quality statements include the vision statement (universal), mission statement (task based), and quality policy (generalized) statement. Apart from the above the latest trend is the directions/guidelines given by the top management for the financial year which lays more emphasis on the immediate task to be planned and executed to meet the customer deadline and parallel working towards achieving long term vision of the organisation.

**11. What is a Vision statement?**

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. It is of course long term strategy that the management

**12. What is a Mission statement?**

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. Mission is referred to as task based on priority and divided between departments or groups so that collective execution becomes effortless and ceaseless. Mission is also referred to as short term strategy and is of project specific.

**13. Distinguish between 'internal customer' and 'external customer'.**

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.

**14. What is importance of customer retention?**

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.

**15. Mention some benefits of implementing 5S principles.**

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

**16. Explain Kaizen (Nov/Dec 2011)**

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 towards improvement falls under the kaizen umbrella.

**17. What do you understand by Supplier Rating? (Apr/May 2015).**

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. The company constitutes a vendor quality team (VQT) that will facilitate an audit for evaluating the Supplier on delivery, quality, consistency, service and responsiveness.

**18. Distinguish between Reward and Recognition. (Nov/Dec 2010)**

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. The Quality Circle framework supports motivating people with both recognition and rewards (cash prizes).

**19. What is the importance of customer focus for an organization?**

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)

**20. List the benefits of Team work (Apr/May 2015)**

- i) Improved solutions to quality problems
- ii) Improved ownership of solutions
- iii) Improved communications
- iv) Improved integration

**21. What are the traits of successful leaders? (Nov/Dec 2015)**

- i) Customers first

- ii) Value people
- iii) Build supplier partnership
- iv) Empower people.

**22. What is strategic quality planning? (Nov/Dec 2015)**

It is defined as the process of deciding on objective of the organization on changes on these objectives, on the resource used to obtain these objectives and on the policies that are to govern the acquisition, use and disposition of these resources.

**23. What is needed for a leader to be effective? (A.U/APRIL/MAY2008)**

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.

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

Groups and surveys. iii) 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..

**25. What are the general duties of a quality council? (A.U/NOV/DEC2007)**

- (i) Develop, with input from all personnel, the core values, vision statement, mission statement, and quality policy statement.
- (ii) Develop the strategic long-term plan with goals and the annual quality improvement program with objectives.

**26. What is a quality policy? (A.U/APRIL/MAY2008)**

The Quality Policy is a guide for everyone in the organization as to how they should provide products and service to the customers. The common characteristics are Quality is first among equals. Meet the needs of the internal and external customers. Equal or exceed the competition. Continually improve the quality. Include business and production practices. Utilize the entire work force.

**27. Define Empowerment? (NOV\DEC 2008)**

Empowerment means invest people with authority. Its purpose is to tap the enormous reservoir of creativity and potential contribution that lies within every worker at all levels. 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 to initiate the necessary steps to satisfy customer requirements within well-defined boundaries in order to achieve organizational goals..

**28. What are the types of teams? (NOV/DEC2007)**

- i) Process improvement team
- ii) Cross-functional team
- iii) Natural work teams
- iv) Self-directed/self-managed work teams

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

- 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.

**30. What are the objectives of Performance measures? (APRIL/MAY2008)**

- 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.

**PART-B& PART-C**

**1. i. Explain the step by step procedure in strategic quality planning? (Nov/Dec 2016)**

**ii. What is supplier partnering? And explain its benefits? (Nov/Dec 2016)**

*Refer: "Radhakrishnan.P, Subramaniyan.S and Raju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

*Refer: "Mikell P.Groover, "Automation, Production Systems, and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**2. What do you mean by customer satisfaction? Explain a customer satisfaction model. (May/Jun2011)**

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**3. Explain all the elements in 5'S principle and also the implementation procedure of 5'S in a manufacturing company. (Nov/Dec 2007, 2011, 2013)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**4. Explain in detail the concept of employee involvement and motivation for enhancing quality (Apr/May 2015).**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**5. Explain in detail about Performance Appraisal. What are its benefits? (May/Jun 2014)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**6. i.Explain the issues related to customer complaints and retention. (Apr/May 2015).**

**ii. What are the various avenues of measuring customer satisfaction? Give examples. (Nov/Dec 2015)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**7. How is PDSA cycle practiced? Give an example (Nov/Dec 2015), (Nov/Dec 2016)**

## **UNIT III TQM TOOLS AND 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.

### **PART-A**

**What are the different ways of benchmarking? (NOV/DEC 2016)**

1. Internal benchmarking: comparison of practices and performance between teams, individuals or groups within an organization.

2. External benchmarking: comparison of organizational performance to industry peers or across industries.

**2.How cause and effect diagram used in TQM? (NOV/DEC 2016)**

Understanding the contributing factors or causes of a system failure can help develop actions that sustain the correction. A cause and effect diagram, often called a "fishbone" diagram, can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories.

**3. List the seven tools of quality/Elemental Statistical Tools. (Nov/Dec 2013, Apr/May 2015)**

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

**4. 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.

**5. What is six sigma? (Nov/Dec 2009)**

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).

**6. What is histogram? And its types.**

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.

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

**7. What is process capability? (May/Jun 2011)**

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.

**8. 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. The potential or probable causes are identified and solutions or recommendations are brainstormed, execution plan prepared for implementation. A tree comparison was drawn up to explain between causes (hidden roots) and effects (foliage visible)

**9. What are the measure benefits of six sigma? (Nov/Dec 2012)**

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. The ultimate result of six sigma will be increase in profit to the company.

**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. Vital few (20%) and Trivial many (80%) means 20% of causes are the reason for 80% of problems and are referred to as 80:20 rules.

**11. What is scatter diagram?**

The scatter diagram is a simple graphical device to depict the relationship between two variables. It is called as correlation diagram aims to establish relationship between two variables.

**12. When do you use the scatter diagram. (Nov/Dec 2015)**

The purpose of the scatter diagram is to display what happens to one variable when another variable is changed. It is a preliminary investigation that checks whether strong or weak relationship exists between two variables.

**13. What is control chart? What are the types of control charts?**

A control chart is a graph that displays data taken over time and the variation of this data. Control charts for variables – for measurable data such as time, length, temperature, weight, pressure. Control charts for characteristics- for quantifiable data such as number of defects, typing errors in a report.

**14. When do you use control chart.**

The purpose of control chart is to identify when the process has gone out of statistical control, thus signalling the need for some corrective action to be taken. We use to check the out of specification or rejections whether the trend is away from the nominal / mean/mid value so that the process centring can be done and can be brought within the limits of dimensions.

**15. 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. Based on the data collected further investigations will be carried out to understand the process / product variability so that optimum controls can be introduced into the process to achieve consistency in quality and function of the product/service.

**16. Differentiate between producer's risk and consumer's risk.**

Producer's risk: It is the probability of rejecting a good lot which otherwise would have been accepted. Consumer's risk: It is the probability of accepting a defective lot which otherwise would have been rejected.

**17. What is Risk Prioritization Number? (May/Jun 2012)**

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

**18. What is Benchmarking?**

Benchmarking is comparing one's existing process outcomes with the best industrial achievement (say comparing productivity improvement with industry best for pump motor product say 97%). A target for achieving the industry best is referred as Benchmarking.

**19. List down 7 new QC Tool.**

The relationship diagram method; KJ method or affinity diagram; the systematic method; the matrix diagram method; Matrix data analysis; PDPC method and arrow diagram method.

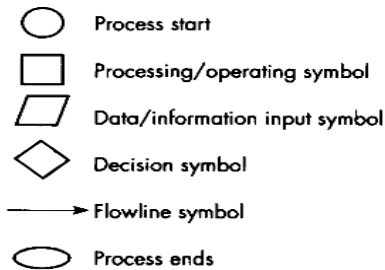
**20. Explain the stages of FMEA.**

Specifying possibilities (Functions; possible root cause; effects; detection and prevention) and quantifying risks (Probability of cause; severity of effect)

**21. What are the reasons for bench marking? (Apr/May 2015, Nov/Dec 2015)**

- i) Benchmarking aims at a goal setting process to facilitate comparison with the best
- ii) It aims at motivating and simulating company employees towards the goal of continuous quality improvement
- iii) It aims at external orientation of the company
- iv) It aims at identifying a technological break through
- v) It aims at searching for industry best practices.

**22. List down the six symbols used in a flowchart**



**23. Define Six Sigma Problem Solving Method? (APRIL/MAY 2008)**

Define - improvement opportunity with an emphasis on increasing customer satisfaction.  
 Measure - determine process capability (Cp/ Cpk) & 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.

**24. 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

**25. Give the seven tools of quality? (APRIL/MAY 2008)**

Pareto Diagram, Process Flow Diagram, Cause-and-Effect, Diagram Check Sheets, Histogram, Control Charts, Scatter Diagrams

**26. Enumerate the steps to benchmark? (APRIL/MAY 2008)**

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

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

- i. Phrase the objective ii. Record all responses
- iii. Group the responses iv. Organize groups in an affinity diagram

**28. What are the types of benchmarking? (NOV/DEC 2008)**

- i. Internal ii. Competitive iii. Process

**29. Give at least five standard formats of matrix diagram? (NOV/DEC 2007)**

L-shaped, T-shaped, Y-shaped, C-shaped, X-shaped

**30. What are the various patterns of scatter diagrams? (APRIL/MAY 2008)**

Positive correlation, Negative correlation, No correlation, Negative correlation may exist  
 Correlation by stratification, Curvilinear relationship

**PART-B& PART-C**

**1. Explain seven traditional tools for quality of TQM. (May/Jun 2010, Dec. 12, May/Jun 2014)**

Refer: “Radhakrishnan.P, Subramaniyan.S and Raju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

**2. Explain six sigma concepts with an example. (May/Jun 2013) (Nov/Dec 2016)**

Refer: “Radhakrishnan.P, Subramaniyan.S and Raju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

Refer: “Mikell P. Groover, “Automation, Production Systems, and CIM”, Prentice- Hall, 1987”, Page No from 6

to 7 and from 10 to 11.

**3. Explain bench marking and its steps with an example. (Nov/Dec 2013, Nov/Dec 2015) (Nov/Dec 2016)**

Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

**4 Explain new seven TQM tools. (May/Jun 2008, Nov/Dec 2011, Nov/Dec 2015) (Nov/Dec 2016)**

Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

**5. Explain the failure mode and effect analysis (FMEA) and its types with an example.(May/June2014, Nov/Dec 2015) (Nov/Dec 2016)**

Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

**6. Develop procedure for implementation of SIX sigma in a manufacturing organization.(Apr/May 2015)**

Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9

## UNIT IV TQM TOOLS AND TECHNIQUES II

Control Charts - Process Capability - Concepts of Six Sigma - Quality Function Development (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

### PART-A

**1. Write the specific uses of np-chart? (NOV/DEC 2016)**

An np-chart is an attributes control chart used with data collected in subgroups that are the same size. .Np-charts are used to determine if the process is stable and predictable, as well as to monitor the effects of process improvement theories.

**2.Define process capability index? (NOV/DEC 2016)**

In process improvement efforts, the process capability index or process capability ratio is a statistical measure of process capability: the ability of a process to produce output within specification limits. The concept of process capability only holds meaning for processes that are in a state of statistical control.

**3. What is quality circle and its structure? (May/June 2013, Nov/Dec 2013)**

QC is a group activity practiced at regular intervals which focuses on quality practices. It comprises of the line operator, supervisor and project engineering, headed by the lowest cadre, i.e., line operator. QC stresses upon the ownership concept to entrust the responsibilities and work as a team to achieve consistent quality in products/service offerings Executive committee, steering committee, facilitators, QC leader, Deputy leader, members 5-8%.

**4. What is the essential feature of Total Productive Maintenance? (TPM) (May/Jun 2012, Nov/Dec 2013)**

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/Dec 2008)**

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?**

It is the first area in QFD (Quality Function Deployment) process, it is used to translate VOC (Voice of Customer) in to design requirement in order to ensure that all engineering decisions have the basis to meet the customer needs.

**7. What are the eight pillars of TPM?**

The eight pillars of TPM are: [1] 5S, [2] JishuHozen (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.

**8. What are the three categories of losses identified in TPM? (May/Jun 2014)**

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

**9. What is Business Process Reengineering (BPR)?**

The fundamental rethinking and radical redesign of business processes to improve performance dramatically in terms of

measures like cost, quality, service, and speed. BPR concentrates on stable and effective changes and not upside down change and changes planned are process accommodative and not adjustable.
<b>10. What is Taguchi's Loss function? (TQLF) (May/Jun 2012, Apr/May/Jun 2015)</b> 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.
<b>11. Give Taguchi's definition of quality.</b> "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.
<b>12. What is voice of customer (VOC)?</b> It is the requirements of the customers in a product and the requirements are described by them in their own words. VOC brings in the customer mindset and does not consider with market dynamics. VOC is the basic step followed in House of quality concept.
<b>13. What are the four categories of quality costs?</b> 1. Prevention costs, 2. Appraisal costs, 3. Internal failure costs and 4. External failure costs.
<b>14. What are internal failure costs and external failure costs? (May/Jun 2012)</b> Internal: These are costs required to identify, repair, replace, or dispose of defective products/services prior to delivery to the customer. External: Cost of warranty, cost of loss of image, cost of service etc.
<b>15. What are the performance measures of TQM?</b> Customer orientation, value based operations, performance compatibility, teamwork, development and monitoring. Current perspective includes VAVE (Value added value engineering) integrated with TQM, concentrates on productivity, as productivity is producing parts with right quality and quantity.
<b>16. What is QFD?</b> 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.
<b>17. What is Poka Yoke?</b> Poka Yoke is Mistake proofing. Humans tend to make mistakes. Designing the product with the ability to alarm or inform the humans that their handling is wrong. Automation imbibes Poka-yoke features added to it thus separate focus on error-proofing has no longer required in a manufacturing cell.
<b>18. Define TPM.</b> Total Productive Maintenance was aimed at all the activities with the slogan "Maintenance for Profit". The prime objectives of TPM are improving effective operation rate of machines and equipments; improving reliability for the development of machines and equipments and enhancing manufacturing morale.
<b>19. Explain the types of benchmarking.</b> Internal benchmarking, competitive benchmarking and Process benchmarking
<b>20. Indicate the different parameters used for quality performance measurement.(Apr/May 2015)</b> i) Customer ii) Production iii) Supplier iv) Research & Development v) Human resources vi) Marketing /Sales vii) Administration
<b>21. What sparked the interest of Indian Manufactures in quality circles? (Nov/Dec 2015)</b> i) Quality circles effects on individual characteristics ii) Quality circles effects on individual relations with others iii) Quality circles effects on workers and their attitudes towards the company.
<b>22. What is the importance of Taguchi's quality loss function (TQLF)? (Nov/Dec 2015)</b> The essence of TQLF is that whenever a product deviates from its target performance, it generates a loss to society. This loss is minimal when performance is right on the target, but it grows gradually as one deviates from the target.
<b>23. Define Control chart? (APRIL/MAY2010)</b> Control chart is a means of visualizing the variations that occur in the central tendency and the dispersion of a set of observations.
<b>24. What are the parts of house of quality? (APRIL/MAY2008)</b> 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
<b>25. How will you build a house of quality? (NOV/DEC2007)</b>



- 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.

**26. What are the goals of TPM? (NOV/DEC 2010)**

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

**27. Give the seven basic steps to get an organization started toward TPM? (NOV/DEC2007)**

- 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

**28. What are the benefits of QFD? (APRIL/MAY2010)**

- i. Customer driven ii. Reduces implementation time iii. Promotes teamwork
- iv. Provides documentation

**29. What are the objectives of Performance measures? (APRIL/MAY2008)**

- 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

**30. Give the six basic techniques for presenting performance measures? (APRIL/MAY2008) (APR/MAY 2006)**

- a) Time series graph b) Control chart c) Capability index d) Taguchi's Loss Function
- e) Cost of poor quality f) Malcolm Baldrige National Quality Award

**PART-B& PART-C**

**1. Explain about Taguchi's Quality Loss Function. (May/Jun 2013, May/Jun 2012, Nov/Dec 2014)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**2. Briefly explain the steps involved in QFD (Nov/Dec 2012, 2013, 2014) (Nov/Dec 2016)**

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**3. Explain each section of the basic structures of house of quality by selecting a suitable product. (May/Jun 2010, May/June 2013, May/June 2014, Apr/May 2015, Nov/Dec 2015)**

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**4. Explain the types and the analysis techniques of cost of quality. (May/Jun 2013)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**5. With an example, draw QFD methodology and explain. (Nov/Dec 2013, Apr/May 2015)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**6. Explain in detail the performance measures used in evaluating an organisation/manufacturing Industries. (Nov/Dec 2014)**

Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9.

**7. i. Explain the stages involved in TPM. (May/Jun 2014)**

**ii. Define quality chart and explain it clearly? (Nov/Dec 2016)**

## UNIT V QUALITY SYSTEMS

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

### PART-A

**1. Name any two generic ISO standards? (Nov/Dec 2016)**

The ISO 9000 family is best known for ISO 9001:2000, the standard that establishes the requirements for a quality management system and which can be used for certification by organizations that wish to have their conformity to the standard verified by an independent auditor

**2. What are the core elements of QMS? (Nov/Dec 2016)**

- Quality policy.
- Quality objectives.
- Quality manual.
- Organizational structure and responsibilities.
- Data management.
- Processes – including purchasing.
- Product quality leading to customer satisfaction.
- Continuous improvement including corrective and preventive action.

**3. What are the general requirements of quality management system? (Nov/Dec 2011)**

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.

**What are ISO 9000 standards or Objectives of ISO 9000 quality standards? (May/Jun 2007, 2014 Nov/Dec 2013, 2014)**

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.

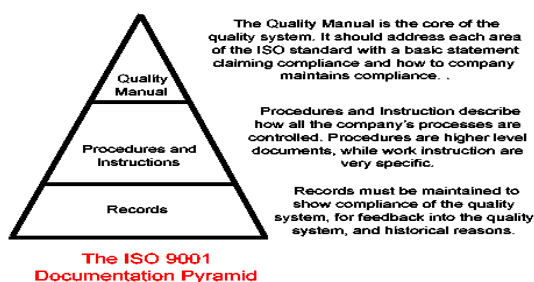
**5. Give any five elements of ISO 9000.**

[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

**6. Explain the management's responsibility for ISO.**

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.

**7. Draw the documentation pyramid. (Nov/Dec 2011)**



**8. Define quality system audit. (May/Jun 2010)**

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

**9. What are the different types of audit?**

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.

**10. What are the different stages in conducting quality audit?**

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.

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

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?**

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. What is the need for ISO standards?**

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. ISO 9000 and ISO 9002 are customer centric quality systems that focus on satisfying the customer by all means

**14. What is third party audit? (Nov/Dec 2010)**

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.

**15. Give the objectives of 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 and
- d) Provide continued improvement in the system through feedback to management.

**16. What is Environment Management Systems Standards? (Nov/Dec 2014)**

An EMS meeting the requirements of ISO 14001:2004 is a management tool enabling an organization of any size or type to: a) identify and control the environmental impact of its activities, products or services; b) to improve its environmental performance continually; c) to implement a systematic approach to setting environmental objectives and targets, to achieving these and to demonstrating that they have been achieved.

**17. What are the benefits of ISO 14001?**

- a) Facilitate trade and remove trade barriers;
- b) improve environmental performance of planet earth and
- c) to build consensus that there is a need for environment management and a common terminology for EMS.

**18. What is QS 9000 and who have developed the system. (May/Jun 2013)**

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 of U.S.A in 1994

**19. List the various clauses of ISO 9001-2000 standards? (Apr/May 2015)**

- i) Scope
- ii) Normative reference
- iii) Terms and definitions
- iv) Quality management systems
- v) Management responsibility
- vi) Resource management
- vii) Product realization
- viii) Measuring, analysis and improvement.

**20. Compare QS 9000 with TS 16949 quality systems. (Apr/May 2015)**

QS 9000	TS 16949
Product approach	Process approach
Customer satisfaction	Employees motivation
More focus on documentation	Less focus on documentation

<p><b>21) What are the items covered by ISO 9000 regarding quality? (Nov/Dec 2015)</b>  i) Fundamental and vocabulary ii) Requirements iii) Guidelines for performance improvement</p>
<p><b>22) Write short notes on ISO Certification.(Nov/Dec 2015)</b>  ISO defined the term quality systems as follows: The quality system is the organizational structure, responsibilities, procedures, processes and resources for implementing quality management.</p>
<p><b>23. What is the need for ISO 9000? (NOV/DEC2007)</b>  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.</p>
<p><b>24. Give the objectives of the internal audit? (NOV\DEC 2008)</b>  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.</p>
<p><b>25. What are the requirements of ISO 14001?</b>  i. General requirements ii. Environmental policy iii. Planning iv. Implementation and operation v. Checking and corrective action vi. Management review</p>
<p><b>26. Give the ISO 9001 requirements? (NOV/DEC2007)</b>  i)Scope ii) Normative Reference iii) Terms and Definitions iv) Quality Management System  v) Management Responsibility vi) Resource Management vii) Product Realization viii) Measurement, Analysis &amp; Improvement</p>
<p><b>27. What are the benefits of ISO? (NOV\DEC 2008)</b>  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.</p>
<p><b>28. What are the methods of actual audit? (NOV\DEC 2008)</b>  i. Examination of documents ii. Observation of activities iii. Interviews</p>
<p><b>29. Define Quality Audits ?</b>  <i>Quality Audits</i> examine the elements of a quality management system in order to evaluate how well these elements comply with quality system requirements.</p>
<p><b>30.What are the benefits of TQM implementation?</b>  The advantages of total quality management (TQM) include: Cost reduction. When applied consistently over time, TQM can reduce costs throughout an organization, especially in the areas of scrap, rework, field service, and warranty cost reduction.</p>
<p><b>PART-B&amp; PART-C</b></p>
<p><b>1. Explain the elements and implementation of ISO 9001. (Nov/Dec 2012, 2013, 2014, May/Jun 2014) (Nov/Dec 2016)</b>  Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9  Refer: “Mikell P.Groover, “Automation,Production Systems,and CIM”, Prentice- Hall, 1987”, Page No from 6 to 7 and from 10 to 11.</p>
<p><b>2. Explain the features and procedures to obtain ISO 14000 environmental certification. (Nov/Dec 2013, Apr/May 2015)</b>  Refer: “Radhakrishnan.P, Subramaniyan.S andRaju.V “Cad/Cam/Cim”, New Age International (P) Limited, 3rd Edition, 2008.”, Page No:9</p>
<p><b>3. a) Discuss about four important documents to be prepared for ISO 9000 certification.</b></p>

**b) What are the benefits of implementing ISO 14000 standards. (Nov/Dec 2014) (Nov/Dec 2016)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**4. Explain the Documentation, Quality auditing, benefits of ISO 9000. (May/Jun 2013, Nov/Dec 2015)**

*Refer: "Stephen P. Robbins & Mary Coulter, "Management", Prentice Hall (India)Pvt. Ltd., 10th Edition, 2009.", Page No from 526 to 530.*

**5. Discuss the implementation requirements of ISO standards to IT industries/service sectors and airline industry (May/Jun 2012)**

*Refer: "Mikell P.Groover, "Automation,Production Systems,and CIM", Prentice- Hall, 1987", Page No from 6 to 7 and from 10 to 11.*

**6. What are the need for documentation, Quality auditing, elements in QMS (Apr/May 2015) (Nov/Dec 2016)**

*Refer: "Radhakrishnan.P, Subramaniyan.S andRaju.V "Cad/Cam/Cim", New Age International (P) Limited, 3rd Edition, 2008.", Page No:9*

**7. What are the origins of QS-9000? Why was it developed despite of the presence of ISO 9000?(Nov/Dec 2015)**