



MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.



MUST KNOW CONCEPTS

MKC

EEE

2021-22

Course Code & Course Name : 19EEE09 & Total Quality Management

Year/Sem : III/V

S.No.	Term	Notation (Symbol)	Concept / Definition / Meaning / Units / Equation / Expression	Units
Unit-I : Introduction				
1.	Quality	$Q = P/E$	Q –Quality P –Performance E – Expectations	
2.	Dimensions of Quality	-	<ol style="list-style-type: none"> 1. Performance 2. Features 3. Reliability 4. Durability 5. Service 6. Response 7. Aesthetics 	-
3.	Quality Planning	-	The process of planning to design and obtain a better quality product or service and to attain new break through goals	-
4.	Steps in Quality Planning	-	<ol style="list-style-type: none"> 1. Establish quality goals. 2. Identify customers. 3. Discover customer needs. 4. Develop product features. 5. Develop process features. 6. Establish process controls, transfer to operations. 	-
5.	Quality Cost.	-	Quality cost is defined as those costs associated with the non-achievement of product	-
6.	Types of Quality Cost	-	<ol style="list-style-type: none"> 1. Prevention cost 2. Appraisal cost 3. Internal Failure cost and 4. External Failure cost 	-
7.	Trend analysis	-	Trend analysis of quality cost shows the changes in cost over time period or change in cost that may occur in future.	-
8.	Pareto Analysis	-	Pareto chart was developed by an Italian economist namely Vilfrado pareto	-
9.	Total Quality Management	-	TQM is an enhancement to the traditional Way of doing business	-

10.	Basic Concepts of TQM	-	<ol style="list-style-type: none"> 1. A committed and involved management to provide long-term 2. Top-to-bottom organizational support. 3. An unwavering focuses on the customer, both internally and externally. 4. Effective involvement and utilization of the entire work force. 5. Continuous improvement of the business and production process. 6. Treating suppliers as partners. 7. Establish performance measures for the processes. 	-
11.	Principles of TQM	-	<ol style="list-style-type: none"> 1. Constancy of purpose: short range and long range objectives aligned 2. Identify the customer(s); Customer orientation 3. Identification of internal and external customers 4. Continuous improvement 5. Workflow as customer transactions 6. Empower front-line worker as 	-
12.	Analysis Techniques for Quality Costs	-	<ol style="list-style-type: none"> 1. Trend Analysis 2. Pareto Analysis 	-
13.	Primary categories of Quality cost	-	<ol style="list-style-type: none"> 1. Preventive cost category 2. Appraisal cost category 3. Internal failure cost category 4. External failure cost category 	-
14.	Typical cost bases	-	<ol style="list-style-type: none"> 1. Labor 2. Production 3. Unit 4. Sales 	-
15.	Optimum cost	-	<ol style="list-style-type: none"> 1. Make comparison with other organizations 2. Optimize the individual categories 3. Analyze the relationships among the cost categories 	-
16.	Quality Improvement Strategy	-	<ol style="list-style-type: none"> 1. Reduce failure costs by problem solving 2. Invest in the “right” prevention activities 3. Reduce appraisal costs 	-
17.	Objectives of TQM	-	To develop a conceptual understanding of the basic principles and methods associated with TQM	-

18.	Needed for a leader	-	People, paradoxically, need security and independence at the same time.	-
19.	Role of senior management	-	Listening to internal and external customers and suppliers through visits, focus groups and surveys	-
20.	General duties of a quality council	-	Develop, with input from all personnel, the core values, vision statement, mission statement, and quality policy statement.	-
21.	Progress report	-	<ol style="list-style-type: none"> 1. Customer satisfaction report 2. Progress on meeting goals 3. Recognition dinner 4. Benchmarking report 	-
22.	Various quality statements	-	<ol style="list-style-type: none"> 1. Vision Statement 2. Mission Statement 3. Quality Policy Statement 	-
23.	Strategic quality planning	-	<ol style="list-style-type: none"> 1. Customer needs 2. Customer positioning 3. Predict the future •Gap analysis 4. Closing the gap 5. Alignment 6. Implementation 	-
24.	Quality policy	-	The Quality Policy is a guide for everyone in the organization as to how they should provide products and service to the customers	-
25.	Characteristics of quality policy	-	<ol style="list-style-type: none"> 1. Quality is first among equals. 2. Meet the needs of the internal and external customers. 3. Equal or exceed the competition. 4. Continually improve the quality. 5. Include business and production practices. 6. Utilize the entire work force. 	-

Unit-II : Tqm Principles

26.	Customer satisfaction	-	Customer satisfaction is one of the major purposes of a quality management system	-
27.	Factors influencing customer satisfaction	-	The factors influencing customer satisfaction are: Performance Features Service Warranty Price Reputation	-
28.	Performance	-	Performance involves fitness for use which is a phrase that indicates that a product and or service is ready for the use of customers at the time of sale	-
29.	Features	-	Features or attributes of a product or service are psychological , time oriented, contractual, ethical and	-

			technological.	
30.	Service	-	An emphasis on customer service is emerging as a method for organization to give the customer the added value	-
31.	Elements of customer service	-	<ol style="list-style-type: none"> 1. Organization 2. Customer care 3. Communication 4. line people 5. Leadership 	-
32.	Employee to customer retention	-	The employee retention has a significant impact on customer retention	-
33.	Motivation	-	Motivation is the creation of the desire to do something	-
34.	Employee 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	-
35.	Team	-	Team is defined as a group of people working together to achieve a common objective or goals	-
36.	Team work	-	Teamwork is the cumulative action of the team during time to fulfill goals of the group	-
37.	Performance appraisal	-	Performance appraisal is to let the employees know how they are doing & provide a basis for promotion & salary increase, counseling and other purposes relating the employees future	-
38.	Steps to achieve employee satisfaction	-	Know thyself Know your employees Establish a positive attitude Share the goals Monitor progress	-
39.	Quality circle	-	QC are the group of people from one work unit who voluntarily meet together on a regular basis to identify, analyse and solve problems	-
40.	Continuous process improvement	-	Continuous process improvement is the heart of TQM Process.	-
41.	Seire	-	Seire is a Japanese word which means Organize	-
42.	Seiton	-	SEITON is a Japanese word which means to put things in order	-
43.	Seiso	-	SEISO is a Japanese word, which means Clean up	-
44.	Seiketsu	-	SEIKETSU is a Japanese word which means Standardise.	-
45.	Shitsuke	-	Shitsuke is a Japanese word which means Discipline	-
46.	5 –S practice	-	5-S (JAPANESE 5-S PRACTICE) is the key for Total Quality	-

			Environment.	
47.	5 –S Practice steps	-	<ol style="list-style-type: none"> 1. Seire (Organize) 2. Seiton (Put things in order) 3. Seiso (Clean up) 4. Seiketsu (Standardise) 5. Shitsuke (Discipline). 	-
48.	Logic behind 5-S Practice	-	The logic behind the 5-S Practice is that organization, neatness, cleanliness, standardization and discipline at the work place	-
49.	Key elements for partnering Relationship	-	<ol style="list-style-type: none"> 1. Long term commitment 2. Trust 3. Shared Vision 	-
50.	KAIZEN	-	Kaizen is a Japanese word, which means small but continuous improvement	-
Unit-III : Statistical Process Control (SPC)				
51.	Statistics	-	Statistics is defined as the science that deals with the collection, tabulation, analysis, interpretation, and presentation of quantitative data	-
52.	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.	-
53.	Types of MCE	-	<ol style="list-style-type: none"> 1. Average 2. Median 3. Mode. 	-
54.	MCE	-	Measure of Central Tendency	-
55.	Measures of dispersion	-	Measures of dispersion describe how the data are spread out or scattered on each side of the central value	-
56.	Uses of Measures dispersion	-	Measures the range and standard deviation	-
57.	Normal curve	-	The normal curve is a symmetrical, unimodal, bell-shaped distribution with the mean, median and mode having the same value.	-
58.	Control chart	-	The control chart is used to keep a continuing record of a particular quality characteristic. It is a picture of process over time.	-
59.	Objectives of the attribute charts	-	<ol style="list-style-type: none"> 1. Determine the average quality level. 2. Bring to the attention of management any changes in the average. 3. Improve the product quality. 4. Evaluate the quality 	-

			performance of operating and management personnel. 5. Determine acceptance criteria of a product before shipment to the customer	
60.	Define	-	Improvement opportunity with an emphasis on increasing customer satisfaction.	-
61.	Measure	-	Determine process capability (Cp/Cpk) & dpmo (defects per million opportunities)	-
62.	Analyze	-	Identify the vital few process input variables that affect key product output variables (“Finding the knobs”)	-
63.	Improve	-	Make changes to process settings, redesign processes, etc	-
64.	Control	-	Implement process control plans, install real-time process monitoring tools, and standardize processes to maintain levels	-
65.	Seven tools of quality	-	<ol style="list-style-type: none"> 1. Pareto Diagram 2. Process Flow Diagram 3. Cause-and-Effect Diagram 4. Check Sheets 5. Histogram 6. Control Charts 7. Scatter Diagrams 	-
66.	Five standard formats of matrix diagram	-	<ol style="list-style-type: none"> 1. L-shaped 2. T-shaped 3. Y-shaped 4. C-shaped 5. X-shaped 	-
67.	Activity network diagram	-	Team members understand the role in the overall plan	-
68.	Various patterns of scatter diagram	-	<ol style="list-style-type: none"> 1. Positive correlation 2. Negative correlation 3. No correlation 4. Negative correlation may exist 5. Correlation by stratification 6. Curvilinear relationship 	-
69.	Control chart	-	Control chart is a means of visualizing the variations that occur in the central tendency and the dispersion of a set of observations	-
70.	Run chart	-	A run chart is a very simple technique for analyzing the process in the development stage	-
71.	p chart	-	The p chart is for the fraction of defective items in a sample.	-
72.	np chart	-	The np chart is for the number of defective items in a sample	-

73.	c chart	-	The c chart is for the number of defects in an item	-
74.	R chart	-	It shows how the range of the subgroups changes over time.	-
75.	X-bar chart	-	It shows how the mean or average changes over time	-
Unit-IV : Tqm Tools				
76.	Six Sigma Problem Solving Method	-	<ol style="list-style-type: none"> 1. Measure 2. Analyze 3. Define 4. Improve 5. Control 	-
77.	New seven management tools	-	<ol style="list-style-type: none"> 1. Diagram 2. Affinity Interrelationship Digraph 3. Tree Diagram 4. Matrix Diagram 5. Prioritization Matrices 6. Process Decision Program Chart 7. Activity Network diagram 	-
78.	Seven tools of quality	-	<ol style="list-style-type: none"> 1. Pareto Diagram 2. Process Flow Diagram 3. Cause-and-Effect Diagram 4. Check Sheets• Histogram 5. Control Charts 6. Scatter Diagrams 	-
79.	Usage of C&E diagrams	-	<ol style="list-style-type: none"> 1. Analyze actual conditions 2. Eliminate conditions causing nonconformities and customer complaints 3. Standardize existing and proposed operations. 	-
80.	Six Sigma	-	Six-Sigma is a business process that allows organizations to drastically improve their bottom line by designing and monitoring everyday business activities	-
81.	Benchmarking	-	Benchmarking is a systematic method by which organizations can measure themselves against the best industry practices	-
82.	Use of Benchmarking	-	The essence of benchmarking is the process of borrowing ideas and adapting them to gain competitive advantage. It is a tool for continuous improvement	-
83.	Steps to benchmark	-	<ol style="list-style-type: none"> 1. Decide what to benchmark 2. Understand current performance 3. Plan 4. Study others 5. Learn from the data6.Use the 	-

			findings	
84.	House of quality	-	The primary planning tool in QFD is the House of Quality.	-
85.	Quality Function Deployment (QFD)	-	Quality function deployment (QFD) is a TQM tool which ensures that customers' requirements are met throughout the design process and also in the production systems.	-
86.	QFD	-	Quality Function Deployment	-
87.	Six steps to build „House of Quality	-	<ol style="list-style-type: none"> 1. Identify voice of the customers 2. Identify technical descriptors. 3. Relate the voice of the customers to the technical descriptors 4. Conduct an evaluation of competing products 5. Evaluate technical descriptors and develop targets. 6. Determine which technical descriptors to deploy in the remainder of the production process 	-
88.	Taguchi's Quality Loss Functions	-	<ol style="list-style-type: none"> 1. Nominal -the -best 2. Smaller –the –better 3. Larger –the –better 	-
89.	Total Productive Maintenance	-	Total Productive Maintenance is defined as keeping the running plant and equipment at its highest productive level with the cooperation of all areas of organization	-
90.	TPM	-	Total Productive Maintenance	-
91.	Predictive maintenance	-	Predictive maintenance is the process of using data and statistical tool to determine when a piece of equipment will fail.	-
92.	Preventive maintenance	-	Predictive maintenance is the process of periodically performing activities such as lubrication on the equipment to keep it running	-
93.	Different loss measurements in TPM	-	<ol style="list-style-type: none"> 1. Down time losses –Planned – Unplanned 2. Reduced Speed Losses 3. Poor Quality Losses 	-
94.	Availability	-	Down time losses are measured by equipment availability (A	-
95.	Failure Mode	-	Failure Mode and Effect Analysis (FMEA) is an analytical technique which combines the technology and experience of the people	-

96.	Effect Analysis	-	To identify foreseeable failure modes of a product(or) process To plan for its elimination	-
97.	FMEA	-	Failure Mode and Effect Analysis	-
98.	Reliability	-	Reliability is defined as the probability of a product performing satisfactorily without failure	-
99.	Three main categories of failure	-	1. Debug 2. Chance 3. Wear out	-
100.	Debug failure	-	Debug includes a high failure rate at the initial stages because of inappropriate	-
Unit-V : Quality Systems				
101.	Quality system	-	In order to assure the quality of a product, the manufacturer must ensure its quality	-
102.	ISO 9000 quality standard	-	The ISO 9000 system is a quality management system that can be adopted by all types of organizations belonging to government, public, private, (or) joint sectors	-
103.	ISO Systems	-	The ISO 9000 system shows the way in creating products by preventing deficiencies, instead of conducting expensive post product inspections and rework.	-
104.	Two party quality systems	-	In two party quality systems, the supplier of the product (or) service would develop a quality system that would conform to his standard	-
105.	Third party registration system	-	A standard quality system must be developed and audited by a third party registration system	-
106.	Some third party registration system	-	1. ISO 9000, 2. QS 9000, 3. ISO 14000	-
107.	Quality auditing	-	Systematic and independent examination to determine whether quality activities and related results	-
108.	Types quality audit	-	1. Internal 2. External audit	-
109.	External audit	-	An internal audit is conducted by personnel within the organization	-
110.	Internal audit	-	An external audit is conducted by people from the organization such as the purchasing party	-
111.	Quality audit” to be classified	-	1. System Audit 2. Process Audit 3. Product Audit 4. Adequacy Audit 5. Compliance Audit	-

112.	Use of QS 9000	-	QS 9000 standard defines the fundamental quality expectations from the suppliers of production and service parts	-
113.	Use of ISO 14000 standard	-	ISO 14000 standard gives the company a background on which to base its Environmental Management System (EMS).	-
114.	Indian Standards System	-	<ol style="list-style-type: none"> 1. ISO :9000 -IS :14000 –1988 2. ISO :9001 -IS :14001 –1988 3. ISO :9002 -IS : 14002 –1988 4. ISO :9003 -IS :14004 –1989 	-
115.	Other quality systems	-	The other quality systems are AS 9100 used in aerospace industry, ISO/TS 16949	-
116.	Quality manual	-	A quality manual is to be established and maintained the data's	-
117.	Steps in quality manual	-	<ol style="list-style-type: none"> 1. The scope of the QMS with details and justification for any exclusions. 2. The documented procedure or references to them. 3. A description of the interaction among the QMS processes 	-
118.	Steps involved in implementing Quality system	-	<ol style="list-style-type: none"> 1. Initiating total quality management. 2. Planning to achieve objective in a coordinated manner. 3. Orientation of staff. 4. Implementation 5. Monitoring. 6. Consolidation 	-
119.	ISO 9000	-	Quality Management and Quality Assurance Standards Guidelines for Selection and Use	-
120.	ISO 9001	-	Quality Systems –Model for Quality Assurance in Design, Development, Production, Installation & Servicing	-
121.	ISO 9002	-	Quality Systems –“Model for Quality Assurance in Production, Installation& Servicing”	-
122.	ISO 9003	-	Quality Systems –“Model for Quality Assurance in Final Inspection and Test	-
123.	ISO 9004-1	-	Quality Management and Quality System Elements –Guidelines	-
124.	Benefits of ISO 14000	-	Global: Facilitate trade and remove trade barriers,	-
125.	Elements for the checking	-	<ol style="list-style-type: none"> 1. Monitoring and measuring Nonconformance and corrective and preventative action 2. Records 	-

			3. EMS audit	
Placement Questions				
126.	Roles of Quality Managers	-	Quality managers are involved in inspecting the final products while making a comparison with the laid requirements	-
127.	Types of Organizational Evaluation Standards	-	<ol style="list-style-type: none"> 1. Environmental 2. Management System Environmental Auditing 3. Environmental Performance Evaluation 	-
128.	Way Can You Measure Your Success	-	<ol style="list-style-type: none"> 1. Meeting employee satisfaction 2. Improving the level of standard of services and products 3. Achieving the set target 4. Successful completion of quality awareness workshops 5. Development of employees in terms of maintaining desired quality” 	-
129.	Greatest Strength Quality Managers	-	My greatest strength is being a quick problem solver. I have demonstrated my problem solving abilities on various occasions	-
130.	Benefits of ISO	-	<ol style="list-style-type: none"> 1. Fewer on-site audit by customers 2. Increased market share. 3. Improved quality, both internally and externally. 4. Improve product and service quality levels from suppliers. 5. Greater awareness of quality by employees. 6. Documented formal systems. 7. Reduced operating costs 	-
131.	ISO 9001 requirements	-	<ol style="list-style-type: none"> 1. Scope 2. Normative Reference 3. Terms and Definitions 4. Quality Management System 5. Management Responsibility 6. Resource Management 7. Product Realization 8. Measurement, Analysis & Improvement 	-
132.	Employees Motivation	-	“Keeping staff members motivated is one way I would use towards achieving good results.	-
133.	Concept of environmental management system	-	The overall aim of the Environmental Management systems is to provide protection to the	-

			environment and to prevent pollution.	
134.	Goals of TPM	-	<ol style="list-style-type: none"> 1. Maintaining and improving equipment capacity 2. Maintaining equipment for life 3. Using support from all areas of the operation 4. Encouraging input from all employees 	-
135.	PMBOK	-	According to PMBOK, the quality management process encompasses determining the quality standards that guide project deliverables and products	-
136.	u chart		The u chart is for the number of defects in a sample.	-
137.	X & MR (moving range) chart	-	An X & MR chart is used when only one observation per subgroup is taken and process variability needs to be determined.	-
138.	Advantage of ISO 14000	-	<ol style="list-style-type: none"> 1. Reducing incidents that result in liability 2. Improving defense posture in litigation 3. Conserving input materials and energy 4. Facilitating the attainment of permits and authorization 5. Improving industry/government relations 	-
139.	Organizational Evaluation Standards		<ol style="list-style-type: none"> 1. Environmental Management System 2. Environmental Auditing 3. Environmental Performance Evaluation 	-
140.	Management Style Do You Employ	-	Delegating authority and responsibility to me is very crucial.	-
141.	Sources of variation	-	<ol style="list-style-type: none"> 1. Equipment 2. Material Environment Operator 	-
142.	Population	-	Population represents the mathematical world and Sample represents the real world.	-
143.	Sample	-	A smooth curve whereas a sample frequency distribution is represented by a histogram.	
144.	Various histogram shapes	-	<ol style="list-style-type: none"> 1. Symmetrical 2. Skewed right 3. Skewed left 4. Peaked 5. Flat 6. Bimodal 7. Plateau distribution 	-

			8. Comb distribution 9. Double peaked distribution	
145.	Brings about results in this job	-	The ability to drive results means a leader who is able to put more focus on the most important things. Quality managers should ensure that everything is done as it should be	-
146.	Daily Routine of Quality Managers	-	As a quality manager, my work will be the inspection of the final product	-
147.	Performance efficiency Equation	$E=(C*N/T)*100$	Here C=Cycle time N= Number of units produced	-
148.	Performance efficiency	-	Reduced speed losses are measured by tracking performance efficiency using the equation,	-
149.	Some effects of failure	-	1. Noise 2. Vibration 3. Erratic operation 4. Poor performance	-
150.	Two important types of FMEA	-	1. Design FMEA 2. Process FMEA	-

Faculty Team Prepared

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Signatures

HoD

