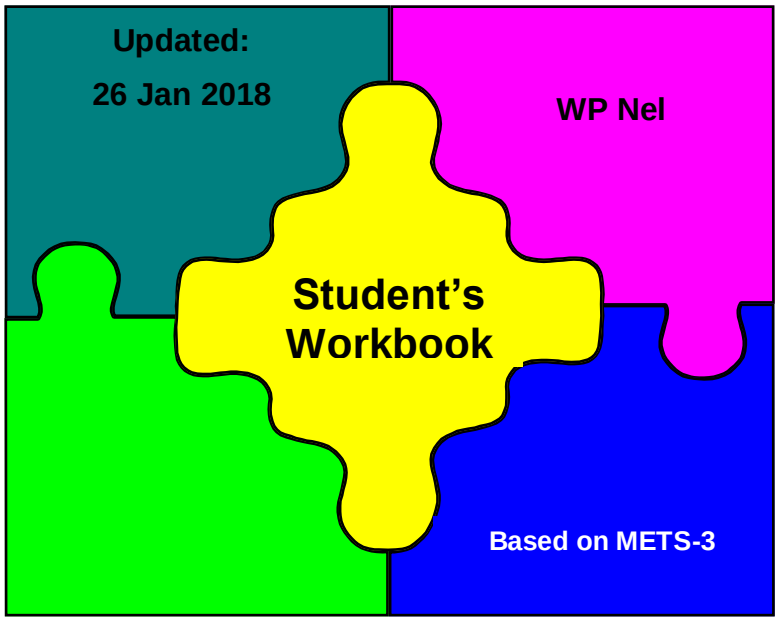
Workbook for students

Chapter 8 – Total Quality Management



Based on: 'Management for Engineers, Technologists and Scientists' (METS-3)

Chapter 8, Total Quality Management

Section 8 A – True/false questions

This section consists of true/false questions. State whether the following statements are true or false. In your answer book, write down 'true' or 'false' and provide a brief explanation for your answer where appropriate.

8A.1 The following **true/false questions** are based on **section 8.1** "**Introduction**" (METS-3: 161) of the textbook.

8A.1.1 Total quality management is a process that ensures that products and services are designed, developed, produced, delivered and supported to meet customer expectations fully, the first time, every time. (1)
Answer: True, (METS-3: 161). (1)

8A.1.2 The goal of total quality management is perfect quality (zero defect). (1)

8A.1.3 To design and build quality into the product is one of the fundamental principles of TQM. (1)

8A.2 The following **true/false questions** are based on **section 8.2** "**Case study: Granite Rock Company**" (METS-3: 162 - 163) of the textbook.

8A.2.1 The quality of a commodity-like product offered to customers can be used to (somewhat) differentiate one company's product from that of another. (1)

8A.3 The following **true/false questions** are based on **section 8.3** "**The voice of the customer**" (METS-3: 163 - 164) of the textbook.

8A.3.1 The focus group technique is the most useful and versatile qualitative research technique for determining the voice of the customer. (1)

8A.4 The following **true/false questions** are based on **section 8.4** "**Employees' involvement in quality improvement**" (METS-3: 164) of the textbook.

8A.4.1 The quality control department at an organisation should be held solely responsible for quality. (1)

8A.4.2 A quality council is a cross-functional team comprising members of senior management and the organisational functions. (1)

8A.4.3 A process improvement team (PIT) is a small group of employees (at shop-floor level) that improve processes and solve quality problems. (1)

8A.5 The following **true/false questions** are based on **section 8.5** "**Continuously strive for zero defect**" (METS-3: 164-165) of the textbook.

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8A.5.1 *Kaizen* is the Japanese word for process variation. (1)

8A.5.2 Continuous improvement is an important aspect of quality improvement. (1)

8A.6 The following **true/false questions** are based on **section 8.6** "**Design and build quality into the product**" (METS-3: 165-168) of the textbook.

8A.6.1 The prevention of future quality problems is a key responsibility of new product development teams. (1)

8A.6.2 Quality function deployment is a formal method for transforming customer requirements into technical requirements. (1)

8A.6.3 For a process to be at Six Sigma it must have fewer than 3,4 defects per 1 000 opportunities for error. (1)

8A.6.4 Quality must be kept in mind as soon as a new product is designed. (1)

8A.6.5 The cost of fixing potential quality problems during the product development phase is usually less than to fix these problems once they are embedded in the product. (1)

8A.7 The following **true/false questions** are based on **section 8.7** "**Focus on the process**" (METS-3: 168-177) of the textbook.

8A.7.1 Deming's rule of thumb is that 94% of all variations are due to special causes and 6% are due to common causes. (1)

8A.7.2 Variation in product quality owing to an incorrect tool setting falls under the category, "variation due to common causes". (1)

8A.7.3 A badly worn machine that causes variation in the output of a manufacturing process is an example of a common cause of variation. (1)

8A.7.4 The use of control charts is part of statistical process control. (1)

8A.7.5 A process is a repetitive set of interacting activities that uses resources to transform a defined set of inputs into outputs that are of value to a customer. (1)

8A.7.6 Process variation results in products of which the quality varies. (1)

8A.7.7 The ability of a process to produce acceptable quality characteristics is called process performance. (1)

8A.7.8 A process is in control when all common causes of variation have been removed. (1)

8A.7.9 The process chart and Pareto analysis are two examples of tools that can be used to improve processes. (1)

8A.8 The following **true/false questions** are based on **section 8.8** "**Suppliers are partners in quality**" (METS-3: 177-178) of the textbook.

8A.8.1 The suppliers of raw materials, components and sub-assemblies should ideally also apply TQM principles. (1)

8A.8.2 One of the advantages of establishing single sources of supply is that it may be possible to negotiate better prices because higher volumes are purchased from that supplier. (1)

8A.8.3 One of the advantages of establishing single sources of supply is that it may be possible to get better service. (1)

8A.9 The following **true/false questions** are based on **section 8.9** "**Quality is free**" (METS-3: 178) of the textbook.

8A.9.1 The cost of quality (COQ) can be thought of as the cost of achieving conformance to quality standards plus the cost of non-conformance. (1)

8A.9.2 Costs related to rework, scrap, inspection, warranty claims and testing are examples of the cost of quality. (1)

8A.9.3 Failure costs are costs associated with evaluation and either correcting or replacing defective products, components or materials that do not meet quality standards. (1)

8A.10 The following **true/false questions** are based on **section 8.10** "**The ISO quality system standards**" (METS-3: 178-181) of the textbook.

8A.10.1 The International Organisation for Standardisation is the publisher of the ISO 9000 standards. (1)

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Section 8 B – Multiple choice questions

This section consists of multiple-choice questions. In your answer book, write down the number of the question, and next to it the number representing the correct option, for example '8.9 [1]'.

8B.1 The following **multiple choice questions** are based on **section 8.1** "**Introduction**" (METS-3: 161) of the textbook.

8B.1.1 Read the following 3 statements:

a) Total quality management is a process that ensures that products and services are designed, developed, produced, delivered and supported to meet customer expectations fully, the first time, every time.

b) The goal of total quality management is perfect quality (zero defect).

c) To design and build quality into the product is one of the fundamental principles of TQM.

Which of the above statements is/are **correct**? (2)

[1] a

[2] a and c

[3] a, b and c

[4] b and c

[5] None of the options (1, 2, 3, or 4) is correct.

8B.1.2 Which one of the following is not a fundamental principle of TQM? (2)

[1] Understand and answer the voice of the customer.

[2] Control chart

[3] All people in an enterprise must be totally involved in quality improvement.

[4] Continuously strive for zero defect.

[5] Focus on the process.

8B.2 The following **multiple choice questions** are based on **section 8.2** "**Case study: Granite Rock Company**" (METS-3: 162 - 163) of the textbook.

None.

8B.3 The following **multiple choice questions** are based on **section 8.3** "**The voice of the customer**" (METS-3: 163 - 164) of the textbook.

None.

8B.4 The following **multiple choice questions** are based on **section 8.4** "**Employees' involvement in quality improvement**" (METS-3: 164) of the textbook.

8B.4.1 Read the following 3 statements:

a) The quality control department at an organisation should be held solely responsible for quality.

b) A quality council is a cross-functional team comprising members of senior management and the organisational functions.

c) A process improvement team (PIT) is a small group of employees (at shop-floor level) that improve processes and solve quality problems.

Which of the above statements is/are **correct**? (2)

[1] a

[2] a and c

[3] a, b and c

[4] b and c

[5] None of the options (1, 2, 3, or 4) is correct.

8B.5 The following **multiple choice questions** are based on **section 8.5** "**Continuously strive for zero defect**" (METS-3: 164-165) of the textbook.

None.

8B.6 The following **multiple choice questions** are based on **section 8.6** "**Design and build quality into the product**" (METS-3: 165-168) of the textbook.

8.6.1 Read the following three statements:

a) The prevention of future quality problems is a key responsibility of new product development teams.

b) Quality function deployment is a formal method for transforming customer requirements into technical requirements.

c) For a process to be at Six Sigma it must have fewer than 3,4 defects per 1 000 opportunities for error.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.7 The following **multiple choice questions** are based on **section 8.7** "**Focus on the process**" (METS-3: 168-177) of the textbook.

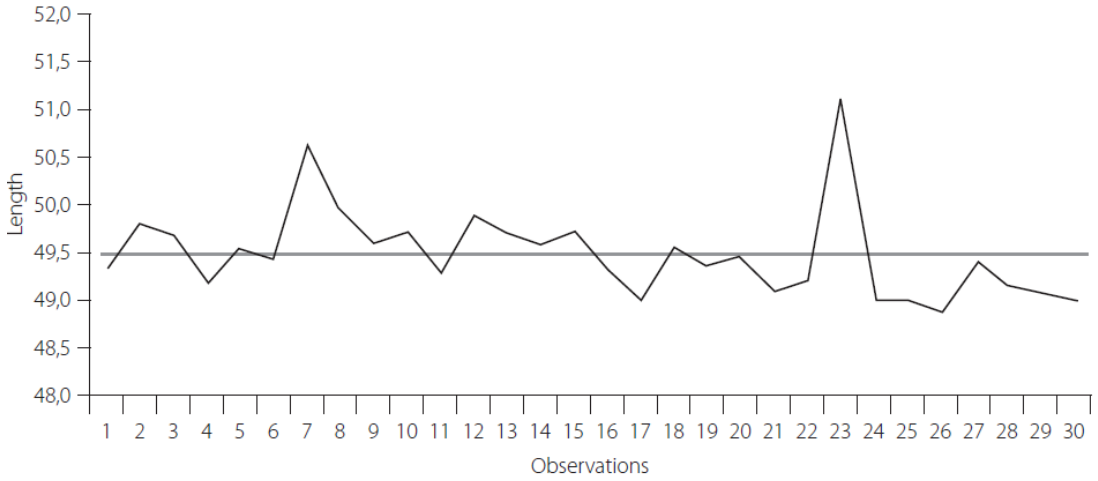

Fig 8.2 Run chart (METS-3: 170)

8.7.1 Read the following three statements regarding fig. 8.2:

a) The varying length of various fittings recorded is an example of process variation.

b) The process that produces the various lengths appears to be unstable.

c) A process is in control when all special causes of variation have been removed.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8.7.2 Control chart theory is based on the differences of the causes of variations in quality. Which one of the following is not an example of, or cannot be linked to, assignable causes of variation? (2)

[1] differences among machines

[2] inherent variation due to chance

[3] differences among workers

[4] differences among materials

Adapted from:

http://www.yancy.org/research/project_management/quality_sample_questions.html

8.7.3 Which one of the following is not a characteristic of process variation that is caused by a common cause? (2)

[1] Variation due to chance.

[2] Cannot be traced to a specific source.

[3] 6% of all causes.

8.7.4 The quality improvement tool that can be described as “a diagram that ranks and displays defects in order of frequency of occurrence (from left to right)” is a: (2)

[1] control chart

[2] vertical bar chart

[3] histogram

[4] Pareto chart

[5] run chart

(Souce: http://www.yancy.org/research/project_management/quality_sample_questions.html)

See also: http://en.wikipedia.org/wiki/Pareto_chart

8.7.5 The Pareto Principle is a technique used by quality managers to determine which quality control problems should be corrected. Which one of the following statements best represents the philosophy employed by this principle? (2)

[1] To minimise financial losses from quality control problems, all problems which have a measureable cost associated with them should be corrected.

[2] The majority of defects are caused by a small percentage of the identifiable problems. Improvement efforts should be reserved for those few vital problems.

[3] To achieve zero defects all quality control problems, including those which do not have a direct financial cost should be corrected.

[4] Generally, 80% of the quality control problems are justifiable for correction via cost-benefit analysis. The remaining 20% are not financially worthy of improvement efforts.

(Souce: http://www.yancy.org/research/project_management/quality_sample_questions.html)

8.7.6 Using Pareto’s Rule and given the data in the table below, where should corrective action focus? (2)

Origin of problem	**% of problems**
Design	80
Development	2
Prototype	9
Testing	3
Fabrication	6

[1] Design

[2] Design, development and prototype

[3] Design and prototype

[4] Development, prototype and fabrication

(Souce: http://www.yancy.org/research/project_management/quality_sample_questions.html)

8.7.7 Which one of the following is not a quality management tool (quality improvement tool)? (2)

[1] Fishbone diagram

[2] Pareto analysis

[3] The process chart

[4] Histograms

[5] Product life cycle

(Adapted from:
http://www.yancy.org/research/project_management/quality_sample_questions.html)

8.7.8 Statistical process control uses diagrams called "Control Charts." These charts depict horizontal, parallel lines to represent _____ standard deviations. (2)

[1] six

[2] five

[3] four

[4] three

[5] two

(Souce: http://www.yancy.org/research/project_management/quality_sample_questions.html)

8.7.9 Read the following 3 statements:

a) Process variation results in products of which the quality varies.

b) Variation in product quality due to an incorrect tool setting falls under the category, 'variation due to common causes'.

c) A process is in control when all the general causes of variation have been removed.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8.7.10 Read the following 3 statements:

a) Deming's rule of thumb is that 94% of all variations are due to special causes and 6% are due to common causes.

b) Variation in product quality owing to an incorrect tool setting falls under the category, “variation due to common causes”.

c) A badly worn machine that causes variation in the output of a manufacturing process is an example of a common cause of variation.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8.7.11 Read the following 3 statements:

a) The use of control charts is part of statistical process control.

b) A process is a repetitive set of interacting activities that uses resources to transform a defined set of inputs into outputs that are of value to a customer.

c) Process variation results in products of which the quality varies.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8.7.12 Read the following 3 statements:

a) The ability of a process to produce acceptable quality characteristics is called process performance.

b) A process is in control when all common causes of variation have been removed.

c) The process chart and Pareto analysis are two examples of tools that can be used to improve processes.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.8 The following **multiple choice questions** are based on **section 8.8** "**Suppliers are partners in quality**" (METS-3: 177-178) of the textbook.

8.8.1 Read the following 3 statements:

a) The suppliers of raw materials, components and sub-assemblies should ideally also apply TQM principles.

b) One of the advantages of establishing single sources of supply is that it may be possible to negotiate better prices because higher volumes are purchased from that supplier.

c) One of the advantages of establishing single sources of supply is that it may be possible to get better service.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.9 The following **multiple choice questions** are based on **section 8.9** "**Quality is free**" (METS-3: 178) of the textbook.

8.9.1 The cost of quality includes ...

a) cost of all work to build a product or service that conforms to the requirements

b) training programmes

c) cost of all work resulting from nonconformance to the requirements.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

Adapted from:
http://www.yancy.org/research/project_management/quality_sample_questions.html

8.9.2 Read the following three statements:

a) The cost of quality (COQ) can be thought of as the cost of achieving conformance to quality standards plus the cost of non-conformance.

b) Costs related to rework, scrap, inspection, warranty claims and testing are examples of the cost of quality.

c) Failure costs are costs associated with evaluation and either correcting or replacing defective products, components or materials that do not meet quality standards.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.10 The following **multiple choice questions** are based on **section 8.10** "**The ISO quality system standards**" (METS-3: 178-181) of the textbook.

8.10.1 The ISO 9000 series is:

[1] a set of instructions for preparing control charts

[2] a set of guidelines for quality

[3] a set of forms and procedures to ensure quality

[4] an international standard that describes a recommended quality system

[5] intended to be applied only to manufactured products

(Souce: http://www.yancy.org/research/project_management/quality_sample_questions.html)

8B.11 The following **multiple choice questions** are based on **Chapter 8** "**Total Quality Management**" (METS-3: 161-182) of the textbook.

8B.11.1 Read the following three statements:

a) The quality of a commodity-like product offered to customers can be used to (somewhat) differentiate one company's product from that of another.

b) The focus group technique is the most useful and versatile qualitative research technique for determining the voice of the customer.

c) Quality function deployment is a formal method for transforming customer requirements into technical requirements.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.11.2 Read the following 3 statements:

a) The quality control department at an organisation should solely be held responsible for quality.

b) The cost of quality (COQ) can be thought of as the cost of achieving conformance to quality standards plus the cost of non-conformance.

c) A process improvement team is a team of employees at shop-floor level who is responsible for quality in their work area.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a and b

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.11.3 Read the following 3 statements:

a) The prevention of future quality problems is a key responsibility of new product development teams.

b) The cost of fixing potential quality problems during the product development phase is usually less than the cost of fixing these problems once they are embedded in the product.

c) Quality function deployment is a formal method for transforming customer requirements into technical requirements.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a, b and c

[4] a and b

[5] None of the options (1, 2, 3, or 4) is correct.

8B.11.4 Read the following 3 statements:

a) A process is a repetitive set of interacting activities that uses resources to transform a defined set of inputs into outputs that are of value to a customer.

b) Costs related to rework, scrap, inspection, warranty claims and testing are examples of failure costs.

c) *Kaizen* is the Japanese word for process variation.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] a, b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

8B.11.5 Read the following 3 statements:

a) The goal of total quality management is perfect quality or zero defect.

b) The focus group technique is the most useful qualitative research technique for determining the voice of the customer.

c) Quality must be a consideration as early as the design phase of a new product.

Which of the above statements is/are **correct**? (2)

[1] b and c

[2] a and c

[3] a, b and c

[4] a and b

[5] None of the options (1, 2, 3, or 4) is correct.

8B.11.6 Read the following three statements:

a) For a process to be at Six Sigma it must have fewer than 3,4 defects per 1 000 opportunities for error.

b) Quality must be kept in mind as soon as a new product is designed.

c) The cost of fixing potential quality problems during the product development phase is usually less than to fix these problems once they are embedded in the product.

Which of the above statements is/are **correct**? (2)

[1] a and b

[2] a and c

[3] b and c

[4] a

[5] None of the options (1, 2, 3, or 4) is correct.

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Section 8 C – short and long questions

8C.1 The following **short and long questions** are based on **section 8.1** "**Introduction**" (METS-3: 161) of the textbook.

Question 8C.1.1

List the fundamental principles of TQM. (7)

8C.2 The following **short and long questions** are based on **section 8.2** "**Case study: Granite Rock Company**" (METS-3: 162 - 163) of the textbook.

Question 8C.2.1

Please read through the case study on the Granite Rock Company (METS-3: 162-163)

Required

Discuss the TQM principles used by the Granite Rock Company. Describe how the company is applying them. Also choose an organisation of your choice and describe what it is doing to improve the quality of its products and services. Explain what can still be done to improve the quality of products and services of this company still further. (12)

8C.3 The following **short and long questions** are based on **section 8.3** "**The voice of the customer**" (METS-3: 163 - 164) of the textbook.

Question 8C.3.1

TQM is about gaining understanding of what customers need. List and briefly explain the approaches to understanding customers, their needs, expectations, perceptions, requirements and the forces that drive them. (12)

8C.4 The following **short and long questions** are based on **section 8.4** "**Employees' involvement in quality improvement**" (METS-3: 164) of the textbook.

Question 8C.4.1

Describe the steps in implementing TQM (total quality management) on an enterprise-wide basis. (5)

8C.5 The following **short and long questions** are based on **section 8.5** "**Continuously strive for zero defect**" (METS-3: 164-165) of the textbook.

Question 8C.5.1

Richard Sconberger has set up rules that sustain the habit of continuous quality improvement while aiming for zero defects. List these rules. (7)

8C.6 The following **short and long questions** are based on **section 8.6** "**Design and build quality into the product**" (METS-3: 165-168) of the textbook.

Question 8C.6.1

Explain how the new products development process can contribute to product quality. (6)

Question 8C.6.2

Study the "voice of customer" (VOC) chart below and explain the role of such a chart in the new product development process. (3)

Product: Steam Iron									
Importance: 3 = Most Important 2 = Moderately Important 1 = Least Important									
			Product Characteristic						
VOC Number	VOC	Importance	Light weight	Self-cleaning	Rotating cord connector	Teflon coated base	20 second warmup period	Intelligent controls	Transparent water reservoir
1	Saves time	3	3	3		3	3	3	
2	Right temperature for all types of fabric	3					3	3	
3	Plate clean at all times	2		2		2		2	
4	See when water is depleted	2							2
5	Heats up in a short period	2					2	2	
6	Cord does not twist and snag	2			2				
7	Optional manual temperature and steam control	2						2	
8	Easy to store	1	1		1				
		Total:	4	5	3	5	8	12	2

8C.7 The following **short and long questions** are based on **section 8.7** "**Focus on the process**" (METS-3: 168-177) of the textbook.

Question 8C.7.1

Explain why the concept of process variation is key to TQM? (3)

Question 8C.7.2

It is important that companies produce products and offer services that are consistently of an appropriate quality level. Differentiate between common and special causes of variation. Why is it important to differentiate between these two types of cause? (7)

Question 8C.7.3

Choose any **three** of the following quality improvement tools and briefly explain how they each can contribute to quality improvement:

- Process chart
- Pareto analysis

- Ishikawa diagram
- Histograms
- Run diagrams and correlation diagrams
- Control charts (6)

Question 8C.7.4 (TQM definitions)

Match each of the following quality management terms on the left of the table with the correct definition on the right. In your answer book, write down the number of each term, and next to it the letter representing the correct option e.g. 1. g. (6)

1. Process chart		a. It is based on the 80/20 rule.
2. Pareto analysis		b. It indicates the frequency of various events/causes.
3. Ishikawa diagram		c. It is used to map activities involved in the manufacturing product or delivery of a service so that value-adding wasteful activities can be identified.
4. Histograms		d. It is used to identify relationships between events and t and between problems and causes.
5. Run charts and correlation diagrams		e. It is used in statistical process control.
6. Control charts		f. It is also known as the cause-and-effect diagram.

Question 8C.7.5

List any **four** quality improvement tools. (4)

8C.8 The following **short and long questions** are based on **section 8.8** "**Suppliers are partners in quality**" (METS-3: 177-178) of the textbook.

Question 8C.8.1

i) List 3 advantages of establishing single sources of supply (of raw materials, components and sub-assemblies). (3)

or

ii) Is it an advantage (or disadvantage) for a company to have a single source of supply (of raw materials, components and sub-assemblies) from a TQM perspective? Provide at least one reason for your answer. (2)

8C.9 The following **short and long questions** are based on **section 8.9** "**Quality is free**" (METS-3: 178) of the textbook.

Question 8C.9.1

Discuss what is meant by "quality is free". (5)

Or (when asked from another angle)

Discuss the terms Prevention costs, appraisal costs and failure costs, and indicate how they can relate to the term "Quality is free". (5)

8C.10 The following **short and long questions** are based on **section 8.10** "**The ISO quality system standards**" (METS-3: 178-181) of the textbook.

Question 8C.10.1

Define the ISO 9000 quality standards. (2)

8C.11 The following **short and long questions** are based on **Chapter 8** "**Total Quality Management**" (METS-3: 161-182) of the textbook.

Question 8C.11.1

Explain why all people in an organisation should be involved in quality improvement. (4)

Question 8C.11.2

i) Explain how the quality of products and services offered by an organisation can be improved. (6)

Or

ii) Japan's economy was completely devastated by World War II which ended in 1945. Various Japanese leaders knew that the country had to produce exports in order to survive. At the time Japanese products were associated, however, with poor quality. To improve the quality of Japanese products, various programmes had to be introduced and quality gurus such as Deming, Juran, Ishikawa and Taguchi were consulted at a time when various theories, practices, principles and concepts such as "Quality is Free", "continuous process improvement", quality control circles, statistical process control and total quality management

were developed. By the 1970s and 1980s, after years of hard work, Japanese companies managed to change the perceptions of customers regarding the quality of their products world-wide for the better.

References

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- Schonberger, R.J. & Knod, E.M. 1994. Operations Management: Continuous Improvement. Burr Ridge: Irwin. pp. 26-34

Required

You have been appointed as the Engineering Manager at a local company who has plans to market its products in developed countries in future. Management knows that the customers in such markets require good quality products. Write a short essay for management in which you provide them with ideas on how the quality of products can be improved.

{Any 20 facts related to quality theory and practice will be accepted} (20)

Question 8C.11.3

Define the following: (16)

- Project Quality Management
- A process improvement team (PIT)
- Quality Assurance
- Quality Circle
- Quality Audit
- Just-In-Time (JIT)
- Total Quality Management (TQM)
- Define the ISO 9000 quality standards.

Question 8C.11.4

Describe what an organisation of your choice is doing to improve the quality of products and services offered by it. Explain what can still be done to improve the quality of products and services still further. (6)

Question 8C.11.5 (TQM definitions)

Match each of the following quality management terms on the left of the table with the correct definition on the right starting with term number 2. In your answer book, write down the number of each term, and next to it the letter representing the correct option e.g. 1. z. (13)

1. Process chart		a. It is based on the 80/20 rule.
2. Process improvement team		b. It is also known as the cause-and-effect diagram.
3. Pareto analysis		c. It indicates the frequency of various events/causes.
1. Appraisal cost		d. Costs associated with all the activities that focus on preventing defects or nonconformance with quality standards.
5. Ishikawa diagram		e. It is used to map activities involved in the manufacturing of a product or delivery of a service so that value-adding and wasteful activities can be identified.
6. Histograms		f. It is used to identify relationships between events and time and between problems and causes.
7. Run charts and correlation diagrams		g. It is used in statistical process control.
8. Control charts		h. A small group of employees (at shop-floor level) that improve processes and solve quality problems.
9. ISO 9000 quality standards		i. Identify, measure and understand customers expectations by means of qualitative and/or quantitative techniques
10. Formal customer research		j. It defines the basic elements of a management system an enterprise should use to ensure that its products and services meet or exceed customer needs and expectations.
11. Process		k. A repetitive set of interacting activities that uses resources to transform a defined set of inputs into outputs that are of value to a customer.
12. Prevention costs		l. Costs associated with evaluating and either correcting or replacing defective products, components or materials that do not meet quality standards.
13. Failure costs		m. Costs associated with measuring, evaluating or auditing products to assure conformance with quality standards and performance requirements.

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Section 8D – Project work

Note: You will find general guidelines for the answering of projects and the writing of reports in Annexure C, at the end of this document.

None

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Section 8E – Case studies

None

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Section 8F – Sources on the world wide web

None

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