



**M.E DEGREE EXAMINATIONS: JUNE 2017**

(Regulation 2015)

Second Semester

**INDUSTRIAL ENGINEERING**

P15IETE05: Total Quality Management

**COURSE OUTCOMES**

**CO1:** Explain various philosophies of quality, quality costs.

**CO2:** Illustrate seven tools of quality and seven new management tools for quality planning

**CO3:** Define QFD, design for quality and conduct FMEA on products or processes.

**CO4:** Outline the need for ISO 9000 systems, advantages, clauses of ISO 9000.

**CO5:** Understand quality systems and apply concepts to implement TQM.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The concept of supplying the needy material at the required time to eliminate storage is called CO5 [K<sub>2</sub>]
  - a) direct storage
  - b) JIT level storage
  - c) zero level storage
  - d) nil level storage
2. Costs associated with efforts in design and manufacturing which are carried out for getting rid of non conformance are called: CO1 [K<sub>2</sub>]
  - a) prevention costs
  - b) appraisal costs
  - c) internal failure costs
  - d) external failure costs
3. Consider the following statements. CO2 [K<sub>2</sub>]
  1. In arrow scheme of networking, an event is an instantaneous point in time.
  2. A dummy activity consumes time but not any other resources
  3. the path with the shortest duration on a network is called as the critical path
  4. An economical network is one that has the least number of dummy activities

Which of these statements are correct?

  - a) 1,3
  - b) 2,3
  - c) 1,4
  - d) 2,4
4. Consider the following statements CO3 [K<sub>2</sub>]
  1. quality of design of a product is the tightness of the specifications for manufacturing the product

2. quality of design refers to the difference in the specification for products which have the same use
3. a part which has a dimensional tolerance of  $\pm 0.002$  mm is said to have a better quality of design than another with a tolerance of 0.02 mm.
4. quality of design refers to the method of construction, processing, material used, safety factors, and so on.

Which of these statements are correct?

- |            |          |
|------------|----------|
| a) 1,2,3,4 | b) 1,2,3 |
| c) 1,2,4   | d) 3,4   |

5. Consider the following 5S principles CO5 [K<sub>1</sub>]
1. Seri-seiton
  2. Seiketsu
  3. Seiso
  4. Shitsuke

The correct sequence of the 5S principles is

- |            |            |
|------------|------------|
| a) 2-3-4-1 | b) 1-3-2-4 |
| c) 3-4-2-1 | d) 4-1-3-2 |

6. The steps involved in drawing a fish bone diagram are given CO2 [K<sub>2</sub>]
1. Specify the effect
  2. Construct the diagram frame work
  3. List all the possible causes
  4. Write the principle causes and sub causes. Continue until all the causes are included

Which is the correct sequence of steps?

- |            |            |
|------------|------------|
| a) 2-1-3-4 | b) 1-3-2-4 |
| c) 3-2-1-4 | d) 3-4-2-1 |

7. Match list I with list II and select the correct answer using the codes given below. CO2 [K<sub>2</sub>]  
(control chart information)

List I	List II
A. Parameter	1. Record of conforming and non-conforming items to a specified requirement
B. Statistics	2. The true, but unknown or difficult to find out directly, numerical values that describe the universe or population
C. Variable data	3. The numerical values that describe the sample
D. Attribute data	4. Record of quality characteristic measured by the use of inspection instruments

- a) A B C D  
1 4 3 2
- c) A B C D  
2 3 4 1

- b) A B C D  
4 1 2 3
- d) A B C D  
3 2 1 4

8. Match list I with list II and select the correct answer using the codes given below.

CO2 [K<sub>2</sub>]

List I	List II
A. Pareto analysis	1. Format designed to collect and analyse data
B. Cause and effect diagram	2. Technique of arranging data according to its importance and then typing it to a problem solving frame work
C. Scatter diagram	3. Used to examine the relationship between two variables to find whether they are related.
D. Check sheet	4. Systematic way of listing down all the possible contributing factors of a quality problem

- a) A B C D  
1 3 4 2
- c) A B C D  
2 4 3 1

- b) A B C D  
4 2 1 3
- d) A B C D  
3 2 4 1

9. Assertion (A) : In scheduled purchasing, minimum inventory is possible to be achieved

CO5 [K<sub>4</sub>]

Reason (R) : In scheduled purchasing, the suppliers are given estimates of purchase requirements over a period of time, enabling them to supply materials only when needed.

- a) Both A and R are Individually true and R is the correct explanation of A
- b) Both A and R are Individually true but R is not the correct explanation of A
- c) A is true but R is false
- d) A is false but R is true

10. Assertion (A): According to Deming, people will do things in the wrong way or they will not do them at all, leading to economic losses due to a lack of feel of security.

CO1 [K<sub>4</sub>]

Reason (R): Due to fear many employees are afraid to ask questions even if they do not understand the job.

- a) Both A and R are Individually true and R is the correct explanation of A
- b) Both A and R are Individually true but R is not the correct explanation of A
- c) A is true but R is false
- d) A is false but R is true

**PART B (10 x 2 = 20 Marks)**

- |  |     |                   |
|--|-----|-------------------|
| 11. State the relevance of a quality vision statement.   | CO1 | [K <sub>2</sub> ] |
| 12. List the components of Juran's Trilogy.  | CO1 | [K <sub>1</sub> ] |
| 13. List the seven tools of quality.   | CO2 | [K <sub>1</sub> ] |
| 14. Draw the basic structure of an affinity diagram.   | CO2 | [K <sub>2</sub> ] |
| 15. What is calculated in the concept of FMEA to draw inferences?                                      | CO3 | [K <sub>2</sub> ] |
| 16. State Taguchi's approach to quality.   | CO3 | [K <sub>2</sub> ] |
| 17. State the purpose of QS 9000.  | CO4 | [K <sub>2</sub> ] |
| 18. List the Big Three companies that took initiatives for a quality standard for automotive industry. | CO4 | [K <sub>1</sub> ] |
| 19. Give an application of POKEYOKE.   | CO5 | [K <sub>3</sub> ] |
| 20. Give an application of JIT?  | CO5 | [K <sub>3</sub> ] |

**PART C (6 x 5 = 30 Marks)**

- |   |     |                   |
|---|-----|-------------------|
| 21. List the various quality costs with suitable examples.                                | CO1 | [K <sub>2</sub> ] |
| 22. Why and how are quality circles formed?"  | CO2 | [K <sub>2</sub> ] |
| 23. Draw the QPD structure and bring out its relevance.                                   | CO3 | [K <sub>2</sub> ] |
| 24. Draw a flow chart of the steps in a quality audit.                                    | CO4 | [K <sub>2</sub> ] |
| 25. Explain the impact of process shift under Six Sigma approach for quality enhancement. | CO5 | [K <sub>2</sub> ] |
| 26. Explain 5S concept with an application.   | CO5 | [K <sub>3</sub> ] |

**Answer any FOUR Questions**

**PART D (4 x 10 = 40 Marks)**

- |   |     |                   |
|---|-----|-------------------|
| 27. In a tabular form, list the 14 principles of Deming with an application for each principle.             | CO1 | [K <sub>3</sub> ] |
| 28. Apply the Process Decision Program Chart (PDPC) management tool for conduct of an event of your choice. | CO2 | [K <sub>3</sub> ] |
| 29. With the relevant process steps, discuss the role of QFD process in satisfying customers' needs.        | CO3 | [K <sub>2</sub> ] |
| 30. In a table, list the elements (clauses) and sub elements of ISO 9000 standards.                         | CO4 | [K <sub>1</sub> ] |
| 31. State the steps in TQM implementation along with the barriers for implementation.                       | CO5 | [K <sub>2</sub> ] |

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