

The Assam Royal Global University, Guwahati

Royal School of Engineering & Technology

B. Tech (Mechanical) 7th Semester

Semester End Examination, January 2023

Course Title: Total Quality Management

Course Code: MEE022D7032

Time: 3 Hours

Maximum Marks: 70

Note: Attempt all questions as per instructions given.

The figures in the right-hand margin indicate marks.

Section – A

- Q.1. Attempt **all** questions. (Maximum word limit 50) 2x8=16
- a. Define the term “quality”.
 - b. Write the equation that would quantify quality.
 - c. Define process capability.
 - d. What is meant by attribute?
 - e. List any four elements of costs of internal failure.
 - f. Write the advantages and disadvantages of pareto analysis.
 - g. Define the term “Total Productive Maintenance”.
 - h. What is the customer’s perception on quality?

Section – B

- Q.2. Attempt **any two** of the following: 7 x 2
- a. State and explain the important principles of TQM.
 - b. Write notes on (i) Quality characteristics and (ii) Chance and Assignable causes. 3.5+3.5=7
 - c. “Various difficulties can be anticipated in the implementation of TQM Program”. Validate the statement.
- Q.3. Attempt **any one** of the following: 14 x 1
- a. Following table contains the data on the weight of a plastic component in grams. This component is manufactured using injection molding process. Mean and Range charts are required to be established for this process.

Sample Number	Measurements			
	X ₁	X ₂	X ₃	X ₄
1	6.35	6.4	6.32	6.37
2	6.46	6.37	6.63	6.41
3	6.34	6.4	6.34	6.36
4	6.69	6.64	6.68	6.59
5	6.38	6.34	6.44	6.4
6	6.41	6.4	6.29	6.34
7	6.38	6.44	6.28	6.58
8	6.35	6.41	6.37	6.38
9	6.56	6.55	6.45	6.48
10	6.38	6.4	6.45	6.37

- (i) Determine the trial control line and control limits. (3)
- (ii) Draw the mean and range charts and plot the values. (3)
- (iii) State whether the process is under statistical control. (1)
- (iv) If not, assume that the deviation occurred due to assignable causes which are rectified now. Revised the central line and control limits. (3)
- (v) Draw the revised mean and range charts and plot the values. (3)
- (vi) State whether the process is now under statistical control. (1)

- b. Compare \bar{X} and R charts. Discuss the circumstances in which either of two or combination of these will be used for the purpose of control. 14

- Q.4. Attempt **any one** of the following **14 x 1**
- a. Describe the Deming's fourteen points for the improvement of quality management.
 - b. Explain (i) Fishbone or Ishikawa diagram
(ii) Pareto analysis
- 7+7=14

- Q.5. Attempt **any two** of the following **6 x 2**
- a. State and explain important principles of TPM.
 - b. Explain the pillars of TPM and its benefits.
 - c. Explain the six basic concepts of TQM.
