UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BME 3043
COURSE	: QUALITY MANAGEMENT
SEMESTER/SESSION	: 2-2024/2025
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **4** questions. Answer **all** questions
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, rise up your hand and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 6 PRINTED PAGES INCLUDING COVER PAGE

Answer all four (4) questions.

QUESTION 1

The purpose of Total Quality Management (TQM) is to provide a quality product or service to customers which will in turn increase productivity and lower costs.

a) "Providing extraordinary customer satisfaction" is the new concept of quality that some Japanese companies have begun to employ. Give **evidence** to support that statement with reference to Figure 1. (4 marks)

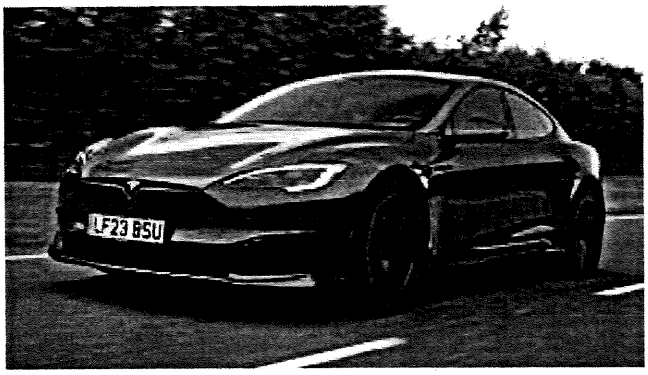

Figure1: Tesla Model S

b) Philip Bayard Crosby (1926-2001) was a businessman and inventor who developed a concept called 'zero defects' and 'do it right the first time'. **Present** the significance of that phrase. (4 marks)

c) **Analyse** five (5) obstacles to implementing Total Quality Management (TQM) and their impact on the company in terms of customer satisfaction and product quality. (10 marks)

d) Six Sigma is a methodology aimed at enhancing quality, cutting costs, and boosting customer satisfaction. The DMAIC (Define, Measure, Analyze, Improve, and Control) framework within Six Sigma provides a structured

problem-solving approach. As a quality engineer, **summarise** your breakthrough strategy for ensuring your organization's success using DMAIC. (10 marks)

QUESTION 2

Manufacturers employ a combination of quality control and quality assurance to jointly uphold and improve the quality of their products. These methodologies complement each other, working in tandem to ensure that the final product or service consistently meets the specified quality criteria and standards.

a) Based on your understanding, briefly **explain** the phrase "work together" in the statement above. Include an example of a defective item in your explanation. (5 marks)

b) **Differentiate** between quality control, quality assurance and testing in terms of purpose, goals, planning, and results, incorporating examples of processes. Any product within the production domain can serve as an illustration in your explanation. (14 marks)

c) Categorise four (4) inspection point area between centralized inspection and on-site inspection. (8 marks)

QUESTION 3

A highly effective technical tool for enhancing product and service quality is statistical process control (SPC). In parallel, process capability studies are carried out to assess the long-term performance of processes operating under statistical control.

a) A manufacturing company has recorded the number of defects in their production process over the past month. The types of defects and their respective frequencies are listed below:

Table 1 : Number of defects from production

Defects	Number of defects
Scratches	120
Misalignment	45
Incorrect dimensions	78
Surface blemishes	32
Broken parts	15
Missing components	10

Construct the cumulative frequency percentage table and Pareto chart to visualize the defect frequencies and identify the most critical types of defects. (12 marks)

b) As quality engineer, you are conducting quality control measurements on the weight (in grams) of 40 randomly selected chocolate bars from a production line. Refer to Table 2, **construct** an X-mean chart and R-chart these data with 3σ control limits, plot the sample range values, and comment on process control. (15 marks)

Table 2 : Sample's data from production

Samples	Weights (oz)				
1	38.2	37.9	38.0	38.1	38.3
2	38.0	38.2	38.0	38.1	38.0
3	38.2	38.1	38.3	38.2	37.9
4	38.0	38.1	38.0	38.2	38.0
5	38.1	38.0	38.2	38.1	38.3
6	38.2	38.0	38.1	38.0	38.2
7	38.1	38.0	38.2	38.0	38.1
8	38.0	38.2	38.1	38.3	38.2

QUESTION 4

Established in 1946, the International Organization for Standardization (ISO) is dedicated to advancing international standards that streamline global trade in goods and services. As the appointed Quality Management System (QMS) consultant for "Tasty Treats," a food company based in Kuala Lumpur, your mission is to assist the company in effectively marketing its products both within the domestic market and on the international stage. **Outline** the essential steps for the successful implementation of the ISO 9001:2015 quality management system within the company. (18 marks)

----------End of questions ----------

Appendix 1

Control chart

Table 1

n	A2	D3	D4
2	1.880	-	3.267
3	1.023	-	2.574
4	0.729	-	2.282
5	0.577	-	2.114
6	0.483	-	2.004
7	0.419	0.076	1.924

$CL = \hat{\bar{x}} = \sum \frac{\bar{x}}{k} =$

$CL = \bar{R} = \hat{R} = \frac{R}{k} =$

$UCL_x = \hat{\bar{x}} + A_2 \bar{R}$ *(Refer Table 1 for value A_2, D_4 and D_3)*

$LCL_x = \hat{\bar{x}} - A_2 \bar{R}$

$UCL_R = D_4 \bar{R}$

$LCL_R = D_3 \bar{R}$