UNIVERSITI
TEKNOLOGI
PETRONAS

FINAL EXAMINATION
MAY 2024 SEMESTER

COURSE	:	**AAB3022 - QUALITY CONTROL**
DATE	:	**30 JULY 2024 (TUESDAY)**
TIME	:	**9.00 AM - 11.00 AM (2 HOURS)**

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in the Answer Booklet.
2. Begin **EACH** answer on a new page in the Answer Booklet.
3. Indicate clearly answers that are cancelled, if any.
4. Where applicable, show clearly steps taken in arriving at the solutions and indicate **ALL** assumptions, if any.
5. **DO NOT** open this Question Booklet until instructed.

Note :

i. There are **FIVE (5)** pages in this Question Booklet including the cover page and appendix.

ii. **DOUBLE-SIDED** Question Booklet.

iii. **Graph papers will be provided.**

1. Establishing a strong quality culture is crucial for the success of any organization, particularly in today's fiercely competitive business landscape.

   a. Differentiate between quality and quality control.

   [4 marks]

   b. There are **FOUR (4)** types of quality characteristics. List and discuss how these characteristics can enhance the profitability of the organization.

   [16 marks]

   c. The implementation of Quality Management System (QMS) can improve the quality conformance in an organization. Discuss the benefits of ISO 9001 certification to an organization.

   [10 marks]

2. Chip board production was monitored based on its weight. **SIX (6)** random samplings from **FIVE (5)** batches of production were measured, and the measurement is shown in **TABLE Q2.**

TABLE Q2 : CHIP BOARD MEASUREMENT READING

Reading	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
1	6.0	5.1	4.7	6.5	4.1
2	5.2	5.5	5.2	7.1	3.9
3	5.5	5.0	5.3	5.6	5.7
4	4.7	4.8	5.0	5.4	5.8
5	6.3	6.2	4.9	5.5	6.2
6	7.8	5.7	5.3	5.9	5.0

a. Determine the control limits for both X-bar and R charts.

[22 marks]

b. Using the values in **part(a),** plot the X-bar and R charts with complete labels.

[14 marks]

c. Propose a recommendation to improve the production quality from the finding in **part(b)**.

[4 marks]

3. There are many approaches and tools that can be used in quality assurance within the industry.

   a. Differentiate between Six Sigma and Visual Management.

   [6 marks]

   b. Discuss Six Sigma methodology in quality management and explain **ONE (1)** benefit of using Six Sigma.

   [14 marks]

   c. Evaluate the impact of the 5S approach by discussing the benefits to organizational efficiency and effectiveness.

   [10 marks]

-END OF PAPER-

APPENDIX A

Equations and properties

$\bar{x}$-R chart

R- chart	*$\bar{x}$ chart*
$UCL=D_4\bar{R}$	$UCL = \bar{\bar{X}} + A_2\bar{R}$
$CL=\bar{R}$	$CL = \bar{\bar{X}}$
$LCL=D_3\bar{R}$	$LCL = \bar{\bar{X}} - A_2\bar{R}$

Sample Size n	Mean Factor A_2	Upper Range D_4	Lower Range D_3
2	1.880	3.268	0
3	1.023	2.574	0
4	.729	2.282	0
5	.577	2.115	0
6	.483	2.004	0
7	.419	1.924	0.076
8	.373	1.864	0.136
9	.337	1.816	0.184
10	.308	1.777	0.223
12	.266	1.716	0.284