

INSTRUCTION:

This section consists of **FOUR (4)** questions. Answers **ALL** questions.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan. Jawap SEMUA soalan

QUESTION 1**SOALAN 1**

- CLO1 a) List **SIX (6)** objectives of the quality control.
C1 *Senaraikan ENAM (6) objektif kawalan kualiti.*
- [6 marks]
[6 markah]
- CLO1 b) Based on the list of procedure for MS ISO 9001 implementation below,
C2 rearrange the procedures in correct order.
Berdasarkan kepada senarai langkah pelaksanaan MS ISO 9001 di bawah, susun semula mengikut urutan yang betul.

TITLE
Corrective Action Procedure / <i>Prosedur Tindakan Pembetulan</i>
Document Control Procedure / <i>Prosedur Kawalan Dokumen</i>
Internal Audit Procedure / <i>Prosedur Audit Dalaman</i>
Preventive Action Procedure / <i>Prosedur Tindakan Pencegahan</i>
Record Control Procedure / <i>Prosedur Kawalan Rekod</i>

[5 marks]
[5 markah]

- CLO1
C2
- c) Explain **THREE (3)** conditions when an industry need to choose between collecting the product's data for quality control evaluation based on the population or samples of the product.
- Jelaskan TIGA (3) situasi yang mana suatu industri perlu memilih untuk mengumpul data produk untuk tujuan penilaian kawalan kualiti berdasarkan kepada populasi atau sampel produk mereka.*
- [6 marks]
[6 markah]
- CLO1
C3
- d) Great Life Co. produced 1000 bottles of cough syrup per day with an average volume of 250 ml and standard deviation of 0.05418. Calculate the percentage of cough syrup that is more than 250.025 ml.
(Calculate the Z value up to 4 decimal points and use interpolation method to obtain accurate answer).
Great Life Co. menghasilkan 1000 botol ubat kahak setiap hari dengan purata isipadu 250 ml dan bersisihan piawai 0.05418. Kirakan peratus botol ubat kahak yang melebihi 250.025 ml.
(Kirakan nilai Z sehingga 4 titik perpuluhan dan gunakan kaedah interpolasi untuk mendapatkan jawapan yang tepat.)
- [8 marks]
[8 markah]

QUESTION 2**SOALAN 2**

- CLO1
C1
- a) List the two pairs of variable control charts and the selection criteria of each pair of the control chart.
Senaraikan dua pasang carta kawalan pembolehubah dan kriteria pemilihan pasangan carta kawalan berkenaan.
- [4 marks]
[4 markah]
- CLO1
C2
- b) Explain:
Jelaskan:
- i. Random (Common cause) variation
Variasi rawak
 - ii. Assignable cause variation
Variasi bersebab
- [4 marks]
[4 markah]
- CLO1
C3
- c) Corning Gorrila Co. produces custom made glass for car windows. **Table 2(c)** below shows the thickness of the glass in millimeter samples for 15 days. Calculate the X bar-R chart's center line, upper control limit and lower control limit. Then plot a complete X bar-R control chart.
*Corning Gorrila Co, menghasilkan cermin kereta khas. **Jadual 2 (c)** di bawah menunjukkan ketebalan cermin berkenaan yang disampelkan dalam 15 hari dalam ukuran milimeter. Kirakan garisan tengah untuk carta kawalan X-bar – R, had kawalan atas dan had kawalan bawah. Kemudian Plotkan carta kawalan X-bar-R.*

Table 2 (c) / Jadual 2 (c)

DAY HARI	SAMPLE'S MEASUREMENT (mm) BACAAN SAMPEL (mm)			
	X1	X2	X3	X4
1	7.4	7.2	7.5	7.6
2	7.5	7.3	7.4	7.4
3	7.2	7.2	7.4	7.4
4	7.3	7.2	7.1	7.1
5	7.2	7.3	7.3	7.2
6	7.4	7.3	7.3	7.3
7	7.6	7.6	7.7	7.7
8	7.3	7.4	7.5	7.3
9	7.3	7.2	7.3	7.3
10	7.4	7.4	7.3	7.4
11	7.4	7.4	7.3	7.3
12	7.8	7.8	7.9	7.8
13	7.3	7.4	7.2	7.3
14	7.3	7.2	7.5	7.3
15	7.1	7.3	7.5	7.4

[14 marks]

[14 markah]

- CLO1 d) Based on the findings in **Question 2 (c)**, write out the control state of the
C3 process.

Berdasarkan kepada dapatan dalam Soalan 2 (c), tuliskan tahap kawalan proses berkenaan.

[3 marks]

[3 markah]

QUESTION 3**SOALAN 3**

CLO1 a) Explain the usage of the following attribute control chart:
C2 *Jelaskan penggunaan carta kawalan atribut yang berikut:*

- i. p-chart
Carta kawalan p
- ii. np-chart
Carta kawalan np
- iii. c-chart
Carta kawalan c
- iv. u-chart
Carta kawalan u.

[4 marks]

[4 markah]

CLO1 b) Yummy Food Sdn. Bhd. is updating their machinery and manufacturing process.
C3 Their engineer recorded the number of nonconformities in their products as shown in **Table 3(d)**. Trial version of the c control chart has been plotted and it is found that \bar{c} is 6.2, UCL is 13.67, and LCL is 0.00. Recalculate the centreline and control limits of the revised c chart.

*Yummy Food Sdn. Bhd. sedang menaiktaraf mesin dan proses pembuatan mereka. Jurutera syarikat berkenaan mencatatkan kecacatan pada produk yang dihasilkan seperti dalam **Jadual 3(b)**. Carta kawalan c (percubaan) mendapati \bar{c} adalah 6.2, HKA adalah 13.67 dan HKB adalah 0.00. Kira semula garisan tengah dan had-had kawalan carta kawalan c (Pembaikan).*

Table 3(b) / Jadual 3(b)

Sample No.	c	Comment/Komen
101	7	
103	3	
104	5	
105	4	
107	6	
110	6	
113	17	Wrong mold used / <i>Acuan salah</i>
114	7	
117	2	
118	0	
120	3	
123	4	Loose handle/ <i>Pemegang longgar</i>
125	2	
127	0	
130	21	Insufficient time in mold / <i>Kekurangan masa dalam acuan</i>
131	3	
133	2	
134	18	Being too long in mold/ <i>Terlalu lama dalam acuan</i>
136	5	
140	9	

[6 marks]

[6 markah]

CLO1
C2

- c) Discuss briefly the switching rules between normal, tightened and reduce inspection.

Bincangkan secara ringkas peraturan pertukaran di antara pemeriksaan biasa, ketat dan ringan.

[5 marks]

[5 markah]

CLO1
C3

- d) Given $N=2000$, $AQL=$ and Level of product is I, acquire the code letter, the value of n (number of sample), Ac (Acceptance Value) and Re (Reject Value) for Single Sampling Plan (Normal Inspection, Tightened Inspection and Reduce Inspection) from the MIL-STD-105D table.

Diberi $N=2000$, $AQL=$ dan tahap produk adalah I, dapatkan kod huruf, nilai n (bilangan sampel), Ac (Penerimaan) dan Re (Penolakan) bagi Pelan Persampelan Tunggal (Biasa, Ringan dan Ketat) daripada jadual MIL-STD-105D.

[10 marks]

[10 markah]

QUESTION 4

SOALAN 4

- CLO1 a) There are four types of quality cost, relate **ONE (1)** example of each quality cost.
C2

*Terdapat empat jenis kos kualiti, kaitkan **SATU (1)** contoh setiap jenis kos kualiti.*

[4 marks]

[4 markah]

- CLO1 b) Categorize the quality cost of each element:
C2
- Kategorikan kos quality untuk elemnt berkenaan:*

Cost Element / Elemen Kos

Complaint handling / Pengendalian aduan

Education and training / Pendidikan dan latihan

Quality planning / Perancangan kualiti

Reinspection and retest of reworked item / Pemeriksaan dan ujian semula

Sales returns and allowance / Pemulangan hasil jualan dan bayaran

Supplier acceptance sampling / Persampelan penerimaan pembekal

[6 marks]

[6 markah]

CLO2

C2

c) Explain briefly the usage of the following techniques in quality control.
Jelaskan secara ringkas kegunaan teknik-teknik berikut dalam kawalan kualiti.

i. Pareto diagram

Rajah Pareto

ii. Cause-and-effect diagram

Rajah Sebab-Akibat

iii. Check sheet

Lembaran Semakan

iv. Process flow

Aliran proses

v. Scatter diagram

Rajah taburan

[5 marks]

[5 markah]

CLO2

C3

d) Sonic Sound Sdn. Bhd. collected data from the dealers of their new Hi-Fi unit and recorded in **Table 4(d)** Check Sheet below. As the Quality Control Technician of the company, construct a Pareto chart to be presented to the Lead Engineer for further improvement on the newly designed stereo system.
*Sonic Sound Sdn Bhd. telah mengumpul data dalam bentuk lembaran semakan daripada penjual Hi-Fi dan nilai direkodkan seperti dalam **Jadual 4(d)**. Selaku Juruteknik Kawalan Kualiti syarikat, binakan satu rajah Pareto untuk diserahkan kepada Jurutera Utama untuk cadangan penambahbaikan pada sistem suara baru.*

Table 4 (d) / *Jadual 4 (d)*

Defects / <i>Kecacatan</i>	Frequency of Defect Detected <i>Kekerapan pengesanan dikesan</i>
Cracked cover <i>Penutup pecah</i>	HHH
Broken 'On/Off' button <i>Butang 'On/Off' rosak</i>	III
Broken handle <i>Pemegang rosak</i>	IIII
Untoned sound level <i>Tahap bunyi tidak dilaras</i>	I
Poor vision on LCD display panel <i>Penglihatan yang lemah pada panel paparan LCD</i>	HHH HHH HHH HHH I
Dented box <i>Kotak rosak</i>	IIII
Scratched CD cover <i>Penutup CD tercalar</i>	II
Others <i>Lain-lain</i>	HHH HHH

[10 marks]

[10 markah]

SOALAN TAMAT