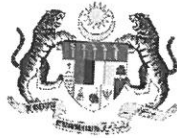


SULIT



**KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI**

**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN TINGGI**

JABATAN TEKNOLOGI KIMIA DAN MAKANAN

PEPERIKSAAN AKHIR

SESI I : 2025/2026

DMT30093: FOOD QUALITY ASSURANCE

TARIKH : 04 DISEMBER 2025

MASA : 2.30 PETANG – 4.30 PETANG (2 JAM)

Kertas ini mengandungi **LAPAN (8)** halaman bercetak.

Struktur (5 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

INSTRUCTION:

This section consists of **FIVE (5)** subjective questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **LIMA (5)** soalan subjektif. Jawab **SEMUA** soalan.*

QUESTION 1**SOALAN 1**

- CLO1 (a) Identify **FOUR (4)** responsibilities of the quality control department.
*Kenalpasti **EMPAT (4)** tanggungjawab jabatan kawalan kualiti.*
- [4 marks]
[4 markah]
- CLO1 (b) Explain **THREE (3)** methods to overcome cross-contamination in the food industry.
*Terangkan **TIGA (3)** kaedah untuk mengatasi pencemaran silang dalam industri makanan.*
- [6 marks]
[6 markah]
- CLO1 (c) X company is planning to produce blueberry juice. This product needs to set quality specifications using Ishikawa Diagram.
Syarikat X merancang untuk menghasilkan jus blueberi. Produk ini perlu tetapkan spesifikasi kualiti menggunakan Diagram Ishikawa.
- i) Explain **TWO (2)** effects of Ishikawa Diagram.
*Terangkan **DUA (2)** kesan Rajah Ishikawa.*
- [4 marks]
[4 markah]

- ii) Draw a suitable set of quality specifications for blueberry jam using Ishikawa Diagram

Lukiskan satu set spesifikasi kualiti jem bluberi yang sesuai menggunakan Rajah Ishikawa.

[6 marks]

[6 markah]

QUESTION 2

SOALAN 2

- CLO1 (a) Recall **TWO (2)** examples of finish product checking.
*Ingat kembali **DUA (2)** contoh pemeriksaan produk siap.*
- [2 marks]
[2 markah]
- CLO1 (b) Explain **TWO (2)** disadvantages of oral instruction given to workers during food processing.
*Terangkan **DUA (2)** keburukan arahan lisan diberikan kepada pekerja semasa pemprosesan makanan.*
- [4 marks]
[4 markah]
- CLO1 (c) i) As the Quality Control Officer at Y company, your task is to receive raw materials such as tomatoes before transferring them to the production department to produce tomato paste.
Explain how to handle tomatoes that do not meet the raw material specifications in **FOUR (4)** steps.
*Sebagai Pegawai Kawalan Kualiti di Syarikat Y, tugas anda adalah untuk menerima bahan mentah seperti tomato sebelum dihantar ke bahagian pemprosesan untuk menghasilkan pes tomato.
Terangkan cara untuk mengendalikan tomato yang tidak memenuhi spesifikasi bahan mentah dalam **EMPAT (4)** peringkat.*

[8 marks]

[8 markah]

- ii) Demonstrate **THREE (3)** purposes of controlling finished products in the production of tomato paste.
Tunjukkan TIGA (3) tujuan mengawal produk siap dalam penghasilan pes tomato.

[6 marks]

[6 markah]

QUESTION 3**SOALAN 3**

- CLO1 (a) Identify **FOUR (4)** benefits of Just-In-Time (JIT).
Kenalpasti EMPAT (4) kelebihan 'Just-In-Time' (JIT).

[4 marks]

[4 markah]

- CLO1 (b) Explain **THREE (3)** types of sampling.
Terangkan TIGA (3) jenis sampling.

[6 marks]

[6 markah]

Table 3 (c)

Jadual 3 (c)

Sex <i>Jantina</i>	Class A <i>Kelas A</i>	Class B <i>Kelas B</i>
Male <i>Lelaki</i>	20	22
Female <i>Perempuan</i>	30	28

- CLO1 (c) You are required to conduct a survey on the satisfaction level of students with the cleanliness of the cafeteria. Based on the data in Table 3 (c), calculate the number of respondents for each class by selecting 20 students for the interview session.

Anda diminta membuat tinjauan mengenai tahap kepuasan pelajar terhadap kebersihan kafeteria. Berdasarkan data dalam Jadual 3 (c), kira jumlah responden bagi setiap kelas dengan memilih 20 orang pelajar untuk sesi temu duga.

[10 marks]

[10 markah]

QUESTION 4**SOALAN 4**

- CLO1 (a) Identify **TWO (2)** main characteristics of quality testing methods.
Kenalpasti DUA (2) ciri utama untuk kaedah ujian kualiti.
- [2 marks]
[2 markah]
- CLO1 (b) Explain **THREE (3)** purposes of texture testing in food analysis.
Terangkan TIGA (3) tujuan bagi ujian tekstur dalam analisis makanan.
- [6 marks]
[6 markah]
- CLO1 (c)
- Table 4(c)
Jadual 4(c)
- | Temperature Reading
<i>Bacaan Suhu</i> | Celcius
(°C) |
|---|-----------------|
| 1 | 4.8 |
| 2 | 4.8 |
| 3 | 5 |
| 4 | 4.8 |
| 5 | 5 |
- i) Temperature reading for the refrigerator is supposed to achieve 5°C. Based on Table 4(c), demonstrate the results obtained are precision or accuracy.

Bacaan suhu bagi peti sejuk seharusnya mencapai 5 °C. Berdasarkan pada Jadual 4(c), tunjukkan sama ada keputusan yang diperolehi adalah ketepatan atau kejituan.

[4 marks]

[4 markah]

- ii) Ahmad is a newly appointed Quality Control Officer at Q Sdn. Bhd, which specialises in coffee drinks. He needs to ensure that the product is high in quality and can be accepted by the consumers. Demonstrate the purpose and suitable instruments for the testing of density.
Ahmad adalah seorang Pegawai Kawalan Kualiti yang baru di Q Sdn. Bhd yang pakar dalam minuman kopi. Dia perlu memastikan produk tersebut berkualiti tinggi dan boleh diterima pengguna. Tunjukkan tujuan dan instrumen yang sesuai bagi ujian ketumpatan.

[8 marks]

[8 markah]

QUESTION 5**SOALAN 5**

- CLO1 (a) Identify **TWO (2)** uses of variable control charts.
Kenalpasti DUA (2) kegunaan carta kawalan berubah – ubah.
- [2 marks]
[2 markah]
- CLO1 (b) Explain **TWO (2)** uses of attribute control charts.
Terangkan DUA (2) kegunaan carta kawalan atribut.
- [4 marks]
[4 markah]

CLO1

- (c) A food manufacturer has booked chocolate drink products for a hypermarket. Acceptance sampling involves selecting 50 samples to assess the presence of defects within them. The data in Table 5(c) below were collected from 10 produced batches.

Sebuah pengeluar makanan telah menempah produk minuman coklat untuk pasar raya besar. Persampelan penerimaan melibatkan pemilihan 50 sampel untuk menilai kehadiran kecacatan di dalamnya. Data dalam Jadual 5 (c) di bawah dikumpul daripada 10 kelompok yang dihasilkan.

Table 5(c)

Jadual 5(c)

Batch <i>Kumpulan</i>	Size sample <i>Saiz sampel, n</i>	Defectives <i>Kerosakan, m</i>
1	40	5
2	40	4
3	40	8
4	40	12
5	40	6
6	40	7
7	40	6
8	40	2
9	40	7
10	40	5

- i) Calculate the total number of sample sizes and defectives, fraction defective, average sample size, average fraction defective, Upper Control Limit, and Lower Control Limit for the final product.

Kirakan jumlah keseluruhan saiz sampel dan kecacatan, pecahan rosak, saiz sampel purata, purata pecahan rosak, Had Kawalan Atas dan Had Kawalan Bawah untuk produk akhir.

[10 marks]

[10 markah]

- ii) Drawing up a suitable graph for Upper Control Limit and Lower Control Limit.

Lukiskan graf yang sesuai untuk tentukan Had Atas Kawalan dan Kawalan Had Bawah.

[4 marks]

[4 markah]

SOALAN TAMAT

DMT 30093 FOOD QUALITY ASSURANCE Control Chart Limits Formula

Variable Data Chart Formulas		
Chart Type	Subgroup Size	Control Limits
\bar{X} and R Average and Range Chart	< 10 (usually 3-5)	\bar{X} Central Line: $\bar{\bar{X}} = \frac{(\bar{X}_1 + \bar{X}_2 + \dots + \bar{X}_k)}{k}$ \bar{X} UCL = $\bar{\bar{X}} + A_2 \bar{R}$ \bar{X} LCL = $\bar{\bar{X}} - A_2 \bar{R}$ R Central Line: $\bar{\bar{R}} = \frac{(R_1 + R_2 + \dots + R_k)}{k}$ R UCL = $D_4 \bar{R}$ R LCL = $D_3 \bar{R}$
		X and mR Individuals and Moving Range Chart Note: \tilde{mR} = Median Moving Range

Attribute Data Chart Formulas		
Chart Type	Subgroup Size	Control Limits
p Chart Fraction Defective	Variable or Constant	Central Line: $\bar{p} = \frac{\sum np}{\sum n}$ UCL = $\bar{p} + 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$ LCL = $\bar{p} - 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$
		np Chart Number Defective
c Chart Number of Defects	Constant	Central Line: $\bar{c} = \frac{\sum c}{k}$ UCL = $\bar{c} + 3\sqrt{\bar{c}}$ LCL = $\bar{c} - 3\sqrt{\bar{c}}$
		u Chart Number of Defects per Unit

Factors for Computing Control Chart Limits

\bar{X} & R Chart				
Subgroup Size (n)	A_2	D_3	D_4	d_2
2	1.880	0	3.267	1.128
3	1.023	0	2.574	1.693
4	0.729	0	2.282	2.059
5	0.577	0	2.114	2.326
6	0.483	0	2.004	2.534
7	0.419	0.076	1.924	2.704
8	0.373	0.136	1.864	2.847
9	0.337	0.184	1.816	2.970
10	0.308	0.223	1.777	3.078

