

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 II : 2022/2023

DMT30093: FOOD QUALITY ASSURANCE

TARIKH : 15 JUN 2023

MASA : 8.30 PG – 10.30 PG (2 JAM)

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

Struktur (5 soalan)

Dokumen sokongan yang disertakan : Kertas Graf, Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

INSTRUCTION:

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

ARAHAN:

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

QUESTION 1**SOALAN 1**

- CLO1 (a) State **FOUR (4)** purposes of food quality analysis.
*Nyatakan **EMPAT (4)** tujuan analisis kualiti makanan.*
- [4 marks]
[4 markah]

- CLO1 (b) Describe **THREE (3)** responsibilities of a Quality Control Officer for ensuring the quality of finished products.
*Terangkan **TIGA (3)** tanggungjawab Pegawai Kawalan Kualiti untuk memastikan kualiti produk siap.*
- [6 marks]
[6 markah]

- CLO1 (c) Your company is planning to produce chili sauce. Your team is required to come up with suitable product specifications. Using the Ishikawa Diagram:
Syarikat anda merancang untuk menghasilkan sos cili. Pasukan anda diperlukan untuk tampil dengan spesifikasi produk yang sesuai. Menggunakan Rajah Ishikawa:
- i. Determine the appropriate properties for the sauce.
Tentukan sifat yang sesuai untuk sos.
- [4 marks]
[4 markah]

- ii. Explain the procedure for every sketch made.

Terangkan prosedur bagi setiap lakaran yang dibuat.

[6 marks]

[6 markah]

QUESTION 2

SOALAN 2

- CLO1 (a) Explain **ONE (1)** way of controlling raw material in order to fulfill predetermined specifications.
Terangkan SATU (1) langkah kawalan bahan mentah bagi memenuhi spesifikasi yang diterangkan.
- [2 marks]
[2 markah]
- CLO1 (b) Using the flowchart, identify **TWO (2)** control parameters for any stage in the meatball processing flowchart.
Dengan menggunakan carta alir, kenalpasti DUA (2) parameter kawalan bagi mana-mana peringkat dalam carta alir pemprosesan bebola daging.
- [4 marks]
[4 markah]
- CLO1 (c) Hafiz works as a Production Supervisor in ABC food factory. His routine task is to make sure all the fish ball production is safe and of good quality during processing.
Hafiz bekerja sebagai Penyelia Pengeluaran di kilang makanan ABC. Tugas rutinnya ialah untuk memastikan semua penghasilan bebola ikan berkualiti dan selamat semasa pemprosesan.

- i. Discuss **THREE (3)** characteristics of process control that Hafiz should concentrate on. *Bincangkan TIGA (3) ciri-ciri kawalan proses yang perlu Hafiz tumpukan.*

[6 marks]

[6 markah]

- ii. Identify **TWO (2)** purposes of controlling finished products.
Kenal pasti TWO (2) tujuan kawalan produk akhir.

[4 marks]

[4 markah]

- iii. One day, Hafiz found out that the fishball did not follow the specified production target. This is because Hafiz only gave verbal instructions to workers. Solve this problem by giving **TWO (2)** suitable alternatives.
Pada satu hari, Hafiz mendapati pengeluaran yang dilakukan tidak mengikut sasaran yang telah ditetapkan. Hal ini berlaku kerana Hafiz hanya memberi arahan secara lisan kepada pekerja. Selesaikan masalah ini dengan memberi DUA (2) alternatif yang sesuai.

[4 marks]

[4 markah]

QUESTION 3

SOALAN 3

- CLO1 (a) State **FOUR (4)** purposes of sampling.
Nyatakan EMPAT (4) tujuan persampelan.

[4 marks]

[4 markah]

- CLO1 (b) Explain **THREE (3)** factors that affect sampling in terms of the nature of the test method used.
Terangkan TIGA (3) faktor yang mempengaruhi pensampelan dari segi sifat semulajadi ujian yang digunakan.

[6 marks]

[6 markah]

CLO1

- (c) Amir works as a supervisor at a sauce processing company. He is responsible for carrying out sampling using systematic sampling methods by taking 10 bottles from a line of 200 bottles.

Amir bekerja sebagai penyelia syarikat pemprosesan sos. Dia bertanggungjawab melakukan persampelan dengan menggunakan kaedah persampelan sistematik di mana 10 botol akan dipilih daripada barisan 200 botol

- i. Calculate the number of samples (kth element) for this sampling method.

Kira nombor sampel (elemen kth) bagi kaedah persampelan ini.

[6 marks]

[6 markah]

- ii. Discuss **TWO (2)** classifications of defects that can occur during the sampling.

Bincangkan DUA (2) pengkelasan defek yang boleh berlaku semasa persampelan tersebut.

[4 marks]

[4 markah]

QUESTION 4

SOALAN 4

CLO1

- (a) List **TWO (2)** methods that can be used to analyze pH value in food products.
Senaraikan DUA (2) kaedah untuk menganalisis nilai pH dalam produk makanan.

[2 marks]

[2 markah]

CLO1

- (b) Describe **THREE (3)** types of physical testing methods suitable for a food product.

Jelaskan TIGA (3) jenis kaedah pengujian fizikal yang sesuai bagi produk makanan.

[6 marks]

[6 markah]

- CLO1 (c) Table 1 shows five observations that are carried out daily to determine whether the brix readings reach the controlled value of 60°Brix.

Jadual 1 menunjukkan lima pemerhatian yang dilakukan untuk menentukan sama ada bacaan brix mencapai nilai kawalan 60°Brix.

Table 1: Brix for orange jam

Jadual 1: Brix bagi jem oren

Reading / <i>Bacaan</i>	Brix / <i>Brix</i> (°brix)
1	59
2	60
3	59
4	56
5	58

- i. Relate the results in Table 1 to the terms precision and accuracy.
Kaitkan keputusan Jadual 1 dengan istilah ketepatan dan kejituan.

[6 marks]

[6 markah]

- ii. Discuss **THREE (3)** types of chemical testing involved in food manufacturing.

Bincangkan TIGA (3) jenis pengujian kimia yang terlibat dalam penghasilan makanan.

[6 marks]

[6 markah]

QUESTION 5

SOALAN 5

- CLO1 (a) Name **TWO (2)** types of control charts in Recording and Reporting.
Namakan DUA (2) jenis carta kawalan dalam Merekod dan Melapor.

[2 marks]

[2 markah]

- CLO1 (b) Explain **TWO (2)** significance of Recording and Reporting for food productions.
Terangkan DUA (2) kepentingan Merekod dan Melapor bagi penghasilan produk makanan.
- [4 marks]
[4 markah]

- CLO1 (c) An acceptance sampling is carried out by taking 50 samples to determine the defects on food products. Table 2 shows the data below collected from 10 batches of products.
Satu penerimaan pensampelan dilakukan dengan mengambil 50 sampel untuk menentukan kerosakan produk makanan. Data Jadual 2 dikumpul daripada 10 kelompok produk makanan.

Table 2: The number of defects for 10 batches of sample products

Jadual 2: Jumlah bilangan defek bagi 10 kumpulan sampel produk

Batch/Kelompok	Size sample/Saiz sampel, n	Defectives/kerosakan, m
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 fraction defective, average fraction defective, Upper Control Limit and Lower Control Limit for the final product.

Kirakan jumlah, pecahan rosak, purata pecahan rosak, Had Kawalan Atas dan Had Kawalan Bawah untuk produk akhir.

[7 marks]

[7 markah]

- ii. Plot an appropriate graph according to the above data.

Plotkan graf yang sesuai berdasarkan data di atas.

[4 marks]

[4 markah]

- iii. Write the summary of the graph

Tuliskan ringkasan graf tersebut.

[3 marks]

[3 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	1	X Central Line: $\bar{\bar{X}} = \frac{(X_1 + X_2 + \dots + X_k)}{k}$
		X UCL = $\bar{\bar{X}} + (3.14 \times \widetilde{mR})$
		X LCL = $\bar{\bar{X}} - (3.14 \times \widetilde{mR})$
		mR Central Line: Median Moving Range
		mR UCL = $(3.87 \times \widetilde{mR})$

Note:
 $\widetilde{mR}$ = 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 = $\bar{p} + 3\sqrt{\bar{p}(1-\bar{p})/n}$
		LCL = $\bar{p} - 3\sqrt{\bar{p}(1-\bar{p})/n}$
np Chart Number Defective	Constant	Central Line: $\bar{np} = \sum np / k$
		UCL = $\bar{np} + 3\sqrt{\bar{np}(1-\bar{p})}$
		LCL = $\bar{np} - 3\sqrt{\bar{np}(1-\bar{p})}$
c Chart Number of Defects	Constant	Central Line: $\bar{c} = \sum c / k$
		UCL = $\bar{c} + 3\sqrt{\bar{c}}$
		LCL = $\bar{c} - 3\sqrt{\bar{c}}$
u Chart Number of Defects per Unit	Variable or Constant	Central Line: $\bar{u} = \sum c / \sum n$
		UCL = $\bar{u} + 3\sqrt{\bar{u}/n}$
		LCL = $\bar{u} - 3\sqrt{\bar{u}/n}$

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

