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 : 2024/2025

DMT30093 : FOOD QUALITY ASSURANCE

TARIKH : 21 MEI 2025
MASA : 11.30 PAGI - 1.30 PETANG (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)

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)** purposes of food quality control.

*Kenalpasti **EMPAT (4)** tujuan kawalan kualiti makanan.*

[4 marks]

[4 *markah*]

CLO1 (b) Explain **THREE (3)** elements of Total Quality Management for an organization.

*Terangkan **TIGA (3)** elemen Pengurusan Kualiti Menyeluruh bagi sesebuah organisasi.*

[6 marks]

[*6 markah*]

CLO1 (c) D'Fresh company is planning to produce new product of blueberry jam. This product needs to set quality specifications using Ishikawa Diagram.

Syarikat D'Fresh merancang untuk menghasilkan produk baru iaitu bluberi jem. Produk ini perlu tetapkan spesifikasi kualiti menggunakan Rajah Ishikawa.

i) Explain **FOUR (4)** procedures in Ishikawa Diagram.

*Terangkan **EMPAT (4)** prosedur dalam Rajah Ishikawa.*

[4 marks]

[*4 markah*]

ii) Draw a suitable set of quality spesifications 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) Indicate the meaning of inventory.
Nyatakan maksud inventori.

[2 marks]
[*2 markah*]

CLO1 (b) Explain the importance of flow chart.
Terangkan kepentingan carta alir.

[4 marks]
[*4 markah*]

CLO1 (c) As the Quality Control Officer at Enerflex company, your task is to receive the raw materials such as oranges concentrate before transferring them to the production department to produce orange juice.
Sebagai seorang Pegawai Kawalan Kualiti di Syarikat Enerflex, anda ditugaskan menerima bahan mentah seperti pekatan oren sebelum dihantar ke bahagian pengeluaran untuk hasilkan jus oren.

i) Explain **FOUR (4)** steps how to handle oranges concentrate that do not meet the raw material specifications.
*Terangkan **EMPAT (4)** peringkat bagaimana untuk mengendalikan pekatan oren yang tidak memenuhi spesifikasi bahan mentah.*

[8 marks]
[8 *markah*]

ii) Predict **THREE (3)** purposes of controlling the finished product in the production of orange juice.

*Ramalkan **TIGA (3)** tujuan mengawal produk siap dalam penghasilan jus oren.*

[6 marks]

[*6 markah*]

QUESTION 3

SOALAN 3

CLO1 (a) Name **FOUR (4)** examples of finished product checking.

*Namakan **EMPAT (4)** contoh pemereiksaan produk siap.*

[4 marks]

[*4 markah*]

CLO1 (b) Explain **THREE (3)** classifications of sampling defect.

*Terangkan **TIGA (3)** klasifikasi untuk kesalahan sampling.*

[6 marks]

[*6 markah*]

CLO1 (c) You are required to conduct a survey on the satisfaction level of students with the food quality at the Cafeteria Bestari Collage. Based on the data in Table 3 (c), calculate the total number of respondents for class.

Anda diminta membuat tinjauan mengenai tahap kepuasan pelajar terhadap kualiti makanan di Kafeteria Kolej Bestari. Berpandukan data Jadual 3(c), kirakan jumlah keseluruhan responden dari setiap kelas.

Table 3 (c) / *Jadual 3 (c)*

Class / *Kelas*	**Number of Students / *Bilangan Pelajar***
A	20
B	25
C	30
D	35
E	40
Total	150

[10 marks]
[*10 markah*]

QUESTION 4
SOALAN 4

CLO1 (a) Identify **TWO (2)** instruments that can be utilized to determine the additives in a food product.
*Kenalpasti **DUA (2)** alat yang digunakan untuk menentukan bahan tambah dalam produk makanan.*

[2 marks]
[*2 markah*]

CLO1 (b) Explain **TWO (2)** purposes of density and colour testing in food analysis.
*Terangkan **DUA (2)** tujuan bagi ujian bagi ketumpatan dan warna dalam analisis makanan.*

[6 marks]
[6 *markah*]

CLO1

(c)

Table 4(c)/*Jadual 4(c)*

Temperature Reading / *Bacaan Suhu*	**Celcius (°C)**
1	3.8
2	3.8
3	4
4	2.8
5	3.2

i) Based on Table 4(c), temperature reading for refrigerator supposes to achieve 4 °C. Relate the results with precision and accuracy.
Berdasarkan pada Jadual 2, bacaan suhu bagi peti sejuk seharusnya mencapai 4 °C. *Kaitkan keputusan dengan ketepatan dan kejituan.*

[4 marks]
[*4 markah*]

ii) Physical testing in the food industry refers to the methods used to evaluate a food product's physical attributes. Explain **TWO (2)** purposes and the suitable instrument for the following testing methodology.
*Ujian fizikal dalam industri makanan merujuk kepada kaedah yang digunakan untuk menilai sifat fizikal produk makanan. Terangkan **DUA (2)** tujuan dan instrumen yang sesuai untuk kaedah ujian berikut.*

a. Shape and size
Bentuk dan saiz

[4 marks]
[*4 markah*]

b. Texture
Tekstur

[4 marks]
[*4 markah*]

QUESTION 5

SOALAN 5

CLO1 (a) Identify **TWO (2)** types of control charts utilized in Recording and Reporting
*Kenalpasti **DUA (2)** jenis carta kawalan yang digunakan dalam Merekod dan Melapor.*

[2 marks]
[*2 markah*]

CLO1 (b) Explain **TWO (2)** significance of recording and reporting.
*Terangkan **DUA (2)** kepentingan merekod dan melapor.*

[4 marks]
[*4 markah*]

CLO1 (c) A food manufacturer has booked milk 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 was collected from 10 produced batches.
Sebuah pengeluar makanan telah menempah produk susu 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 *Kumpulan*	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) Based on Table 5(c), 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.

Berdasarkan Jadual 5(c), 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) Draw a suitable graph and determine the Upper Control Limit and Lower Control Limit.

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

[4 marks]

[*4 markah*]

SOALAN TAMAT

DMT30093 FOOD QUALITY ASSURANCE
Control Chart Limits

Variable Data Chart Formulas

Chart Type	Subgroup Size	Control Limits
$\bar{X}$ and R Average and Range Chart	< 10 (usually 3-5)	$\bar{\bar{X}}$ Central Line: $\bar{\bar{X}} = \frac{(\bar{X}_1 + \bar{X}_2 + \ldots \bar{X}_k)}{k}$ $\bar{X}$ UCL = $\bar{\bar{X}} + A_2\bar{R}$ $\bar{X}$ LCL = $\bar{\bar{X}} - A_2\bar{R}$ R Central Line: $\bar{R} = \frac{(R_1 + R_2 + \ldots R_k)}{k}$ R UCL = $D_4\bar{R}$ R LCL = $D_3\bar{R}$
X and mR Individuals and Moving Range Chart Note: $\widetilde{mR}$ = Median Moving Range	1	X Central Line: $\bar{X} = \frac{(X_1 + X_2 + \ldots X_k)}{k}$ X UCL = $\bar{X} + (3.14 \times \widetilde{mR})$ X LCL = $\bar{X} - (3.14 \times \widetilde{mR})$ mR Central Line: Median Moving Range mR UCL = $(3.87 \times \widetilde{mR})$

Attribute Data Chart Formulas

Chart Type	Subgroup Size	Control Limits
p Chart Fraction Defective	Variable or Constant	Central Line: $\bar{p} = \Sigma np / \Sigma n$ 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: $\overline{np} = \Sigma np / k$ UCL = $\overline{np} + 3\sqrt{\overline{np}(1-\bar{p})}$ LCL = $\overline{np} - 3\sqrt{\overline{np}(1-\bar{p})}$
c Chart Number of Defects	Constant	Central Line: $\bar{c} = \Sigma c / k$ 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: $\bar{u} = \Sigma c / \Sigma n$ 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