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 : 2024/2025

DMT30093 : FOOD QUALITY ASSURANCE

TARIKH : 03 DISEMBER 2024
MASA : 11.30 PAGI – 1.30 PETANG (2 JAM)

Kertas soalan ini mengandungi **TUJUH (7)** halaman bercetak.

Subjektif (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)** importance of food quality control.
*Kenalpasti **EMPAT (4)** kepentingan kawalan kualiti makanan.*

[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) ABC Company plans to develop a new product, which is a pineapple juice drink. Explain how to set quality specifications for the product using the Ishikawa diagram.
Syarikat ABC merancang untuk membangunkan produk baru iaitu minuman jus nanas. Terangkan bagaimana untuk menetapkan spesifikasi kualiti bagi produk tersebut menggunakan Ishikawa diagram.

[10 marks]
[*10 markah*]

QUESTION 2

SOALAN 2

CLO1 (a) Identify the characteristics of the term 'Just In Time'.

Kenal pasti ciri-ciri bagi istilah 'Just In Time'.

[2 marks]

[*2 markah*]

CLO1 (b) Explain **TWO (2)** advantages of Just In Time system that are applied in food industries.

*Terangkan **DUA (2)** kebaikan sistem Just In Time yang digunakan dalam industri makanan.*

[4 marks]

[*4 markah*]

CLO1 (c) i. As the Quality Control Officer at a soy beverage company, you are in charge of receiving the raw materials such as soy powder before transferring them to the production department to produce soy beverage. Explain how to handle soy powder that does not meet the raw material specifications in **FOUR (4)** steps.

*Sebagai seorang Pegawai Kawalan Kualiti di syarikat minuman soya, kamu bertanggungjawab menerima bahan mentah iaitu serbuk soya sebelum dihantar ke bahagian pemprosesan. Terangkan bagaimana untuk mengendalikan serbuk soya yang tidak memenuhi spesifikasi bahan mentah dalam **EMPAT (4)** peringkat.*

[8 marks]

[8 *markah*]

ii. Explain how to implement good quality process control in the production of soy beverages in order to meet the standards.

Terangkan bagaimana untuk melaksanakan kawalan proses yang baik dalam penghasilan minuman soya bagi memenuhi piawaian..

[6 marks]

[*6 markah*]

QUESTION 3

SOALAN 3

CLO1 (a) Identify the importance of sampling in food industries.

Kenalpasti kepentingan persampelan dalam industri makanan.

[4 marks]

[4 markah]

CLO1 (b) Explain **THREE (3)** problems in food sampling.

*Terangkan **TIGA (3)** masalah dalam persampelan makanan.*

[6 marks]

[6 markah]

CLO1 (c)

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

Class / *Kelas*	**Number of Students / *Bilangan Pelajar***
Kreatif	36
Inovatif	38
Bestari	28
Cekal	26
Ilmu	27
Total	155

The table shows the number of students from five different classes at Expert College. Some of them were involved as respondents in a survey on the cleanliness level at the cafeteria. Based on Table 3(c), calculate how sampling process will be done, if 40 students are chosen for that survey.

Jadual tersebut menunjukkan jumlah pelajar daripada lima kelas berbeza di Kolej Expert. Sebahagian daripada mereka adalah terlibat sebagai responden dalam kaji selidik tahap kebersihan di kafeteria. Berpandukan kepada Jadual Table 3(c), kirakan bagaimana proses persampelan dibuat jika 40 orang pelajar dipilih bagi kaji selidik tersebut.

[10 marks]

[10 markah]

QUESTION 4

SOALAN 4

CLO1 (a) Identify **TWO (2)** purposes of food additives added to food.

*Kenalpasti **DUA (2)** tujuan aditif makanan ditambah ke dalam makanan.*

[2 marks]

[*2 markah*]

CLO1 (b) Explain **THREE (3)** types of physical testing and their purposes in food products.

*Terangkan fungsi **TIGA (3)** jenis ujian fizikal terhadap produk makanan.*

[6 marks]

[6 *markah*]

CLO1 (c) Table 4(c) shows five observations that are carried out daily to determine whether the brix readings of mango jam reach the controlled value of 60°Brix.

Jadual 4(c) menunjukkan lima pemerhatian yang dilakukan untuk menentukan sama ada bacaan brix jem mangga mencapai nilai kawalan 60°Brix.

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

Reading / *Bacaan*	**Brix / *Brix*** (◦brix)
1	58
2	60
3	58
4	56
5	57

i. Explain how the brix values mentioned in Table 4(c) can affect the quality of the mango jam produced by focusing to the precision and accuracy of the measurement.
Terangkan bagaimana bacaan brix seperti pada Jadual 4(c) memberi kesan kepada kualiti jem mangga yang terhasil dengan memfokuskan kepada ketepatan dan kejituan sesuatu pengukuran.

[6 marks]
[*6 markah*]

ii. Find **THREE (3)** appropriate chemical testing methods and their purposes in the production of apple jam.
*Carikan **TIGA (3)** jenis kaedah ujian kimia yang sesuai beserta fungsinya dalam penghasilan jem epal.*

[6 marks]
[*6 markah*]

QUESTION 5
SOALAN 5

CLO1 (a) Name **FOUR (4)** types of charts commonly used in attribute control charts.
*Namakan **EMPAT (4)** jenis carta yang biasa digunakan dalam carta kawalan sifat.*

[2 marks]
[*2 markah*]

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

[4 marks]
[*4 markah*]

CLO1 (c) A food Quality Assurance Executive at a guava juice processing factory will inspect the defects of guava fruits in batches of 10. The type of defect to be inspected is mold infection on the outer layer of the guava fruits. The collected data are presented in Table 5 (c):

Seorang Eksekutif Jaminan Kualiti Makanan di sebuah kilang pemprosesan jus jambu batu ingin memeriksa kerosakan buah jambu batu dalam 10 lot. Kerosakan yang ingin diperiksa ialah jangkitan kulat pada kulit luar buah jambu batu. Data- data yang ditunjukkan adalah seperti Jadual 5(c):

Table 5 (c) / *Jadual 5(c)*

Batch ***Kumpulan***	**Sample size** ***Saiz sampel***	**Defectives** ***Kerosakan***
1	50	6
2	50	5
3	50	9
4	50	13
5	50	7
6	50	8
7	50	7
8	50	3
9	50	8
10	50	6

i. Based on Table 5 (c), calculate the 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 pecahan rosak , purata saiz sampel, purata pecahan rosak, Had Kawalan Atas dan Had Kawalan Bawah untuk produk akhir.

[10 marks]
[10 *markah*]

ii. Sketch a graph by using the values of the Upper Control Limit and Lower Control Limit.
Lakarkan graf dengan menggunakan nilai-nilai Had Atas Kawalan dan Had Bawah Kawalan.

[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)	$\bar{X}$ 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