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 : 2023/2024

DMT30093 : FOOD QUALITY ASSURANCE

TARIKH : 18 DISEMBER 2023
MASA : 8.30 PAGI – 10.30 PAGI (2 JAM)

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

Struktur (5 soalan)

Dokumen sokongan yang disertakan : Kertas Graf dan Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

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)** importances of food quality control.
*Nyatakan **EMPAT (4)** kepentingan kawalan kualiti makanan.*

[4 marks]
[*4 markah*]

CLO1 b) Explain **THREE (3)** ways of warehouse controlling.
*Terangkan **TIGA (3)** cara pengawalan gudang.*

[6 marks]
[*6 markah*]

CLO1 c) Your company is planning to produce Chocolate Biscuit. Your team is required to come up with a suitable product together with the specifications. Using the right Quality Assurance tool (Ishikawa Diagram), show how the specifications are set.
Syarikat anda merancang untuk menghasilkan Biskut Coklat. Pasukan anda diperlukan untuk tampil dengan produk yang sesuai bersama-sama dengan spesifikasi. Menggunakan alat Jaminan Kualiti yang sesuai (Diagram Ishikawa), tunjukkan bagaimana spesifikasi dibuat.

[10 marks]
[*10 markah*]

QUESTION 2

SOALAN 2

CLO1

a) i) Give the objective of quality specification for food products.

Berikan objektif spesifikasi kualiti untuk produk makanan.

[1 mark]
[*1 markah*]

ii) Define the term out of specification.

Definisikan istilah di luar spesifikasi.

[1mark]
[*1 markah*]

CLO1

b) Explain the reason why a product should have a quality specification.

Terangkan sebab kenapa sesuatu produk mempunyai kualiti spesifikasi.

[4 marks]
[*4 markah*]

CLO1

c)

Receiving raw material
Penerimaan bahan mentah
⇩
Tomato juice (strained)
Jus tomato (ditapis)
⇩
Cooking to a desired consistency (100°C, 15 minutes)
Memasak mengikut kepekatan yang diingini (100°C, 15 minit)
⇩
Hot filling into bottles (88 °C)
Pengisian panas ke dalam botol (88°C)
⇩
Pasteurization(82°C , 20 minutes)
Pempasteuran (82°C, 20 minit)
⇩
Cooling
Penyejukan
⇩
Storage at room temperature
Penyimpanan pada suhu bilik
⇩
Packing and storage
Pembungkusan dan penyimpanan

Diagram 2(c) / *Gambar rajah 2(c)*

Lazat's Factory produces tomato paste and plans to make processing control so that it meets the products specifications. Based on the flowchart given,
Kilang Lazat menghasilkan pes tomato, dan merancang untuk membuat kawalan pemprosesan supaya produk memenuhi spesifikasi. Berdasarkan carta alir yang diberikan,

i. Write **THREE (3)** control points based on the flowchart process given.
*Tuliskan **TIGA (3)** titik kawalan berdasarkan aliran proses yang diberikan..*

[3 marks]
[*3 markah*]

ii. Write **THREE (3)** common raw material controls during the receipt of tomatoes.
*Tuliskan **TIGA (3)** kawalan bahan mentah yang biasa berlaku semasa penerimaan tomato.*

[3 marks]
[*3 markah*]

iii. Determine **FOUR (4)** finished product controls of tomato paste with the examples.
*Tentukan **EMPAT (4)** kawalan produk siap bagi pes tomato beserta contoh.*

[8 marks]
[*8 markah*]

QUESTION 3

SOALAN 3

CLO 1

a) State the meaning of sample and sampling.

Nyatakan maksud sampel dan persampelan

[4 marks]
[*4 markah*]

CLO 1

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

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

[6 marks]
[*6 markah*]

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

Sex *Jantina*	DTM 3A	DTM 3B
Male *Lelaki*	10	12
Female *Perempuan*	30	28

CLO 1

c) You are required to make a survey on the satisfaction level of students towards facilities. Based on the data in Table 3 (c),

Anda diminta membuat tinjauan mengenai tahap kepuasan pelajar terhadap kemudahan. Berdasarkan data dalam Jadual 3 (c),

i) Calculate the total of each student by getting 15 respondents from the data for the interview session.

Kirakan jumlah setiap pelajar dalam mendapatkan 15 responden daripada data tersebut bagi sesi temuduga.

[10 marks]
[*10 markah*]

QUESTION 4

SOALAN 4

CLO 1

a) Give **TWO (2)** main characteristics of food quality testing methods.
*Berikan **DUA (2)** ciri utama kaedah pengujian kualiti makanan.*

[2 marks]
[*2 markah*]

CLO 1

b) Explain **THREE (3)** purposes of analyzing food texture.
*Terangkan **TIGA (3)** tujuan menganalisis tekstur makanan.*

[6 marks]
[*6 markah*]

CLO 1

c) Table 4 (c) shows the quality inspection of strawberry jam production for Group A and Group B. Six observations are carried out to determine whether the brix of strawberry jam is within the controlled range of 60°Brix. The data obtained from the sampling are as follows;
Jadual 4(c) menunjukkan pemeriksaan kualiti dalam penghasilan jem strawberi bagi Kumpulan A dan Kumpulan B. Enam pemerhatian dilakukan setiap hari untuk menentukan di mana brix jem strawberi berada dalam lingkungan terkawal iaitu 60°Brix. Data yang diperoleh dari pengambilan sampel adalah seperti berikut;

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

°Brix *°Brix*	Group A *Kumpulan A*	Group B *Kumpulan B*
Reading *Bacaan* 1	58	61
Reading *Bacaan* 2	63	61
Reading *Bacaan* 3	61	60
Reading *Bacaan* 4	64	58
Reading *Bacaan* 5	56	58
Reading *Bacaan* 6	57	59

i. Using an appropriate diagram, determine which group data are the most accurate and precise.
Menggunakan gambarajah yang sesuai, tentukan data kumpulan mana yang paling tepat dan jitu.

[12 marks]
[*12 markah*]

QUESTION 5

SOALAN 5

CLO 1 a) Define the terms of recording and reporting
Definisikan istilah perekodan dan pelaporan

[2 marks]
[*2 markah*]

CLO 1 b) Recording and reporting are important after the final production of a product. Explain **TWO (2)** importance of recording and reporting.
*Perekodan dan pelaporan adalah penting selepas pengeluaran akhir bagi sesuatu produk. Terangkan **DUA (2)** kepentingan perekodan dan pelaporan.*

[4 marks]
[*4 markah*]

CLO 1 (c) A hypermarket has received milk products that was booked from a food company. Acceptance sampling is carried out by taking 50 samples to determine the defective on the samples. The data on Table 5 below is collected from 10 batches that had been produced.
Sebuah pasaraya telah menerima produk makanan yang telah ditempah deripada sebuah syarikat pengeluar makanan. Penerimaan pensampelan dilakukan dengan mengambil 50 sampel untuk menentukan kerosakan pada sampel. Data pada Jadual 5(C) di bawah dikumpul daripada 10 kelompok yang telah dihasilkan.

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

Batch *Kumpulan*	Sample Size *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

ii. Calculate the total sum of sample size 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. Sketch an appropriate graph and determine the Upper Control Limit and Lower Control Limit.
Lakarkan graf yang sesuai dan 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)	$\bar{\bar{X}}$ 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