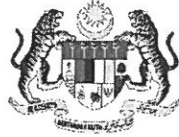


SULIT



**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

DMK10033: INTRODUCTION TO OIL AND FAT

TARIKH : 06 JUN 2023

MASA : 2.30 PTG – 4.30 PTG (2 JAM)

Kertas ini mengandungi **SEPULUH (10)** halaman bercetak.

Struktur (5 soalan)

Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

INSTRUCTION:

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

ARAHAN:

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

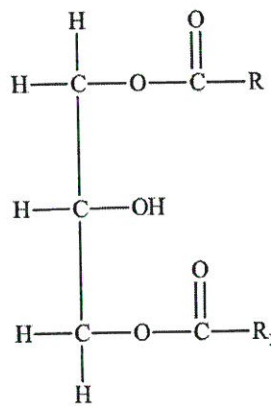
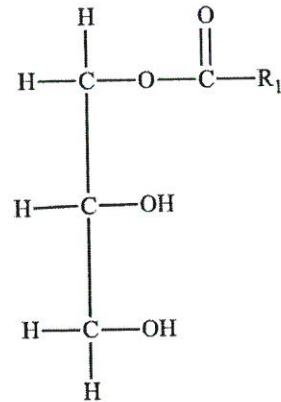
QUESTION 1**SOALAN 1**

- CLO1 (a) List **TWO (2)** main elements in lipid.
*Senaraikan **DUA (2)** unsur utama dalam lipid.*
- [2 marks]
[2 markah]
- CLO1 (b) List **FOUR (4)** main groups of complex lipid.
*Senaraikan **EMPAT (4)** kumpulan utama lipid kompleks.*
- [4 marks]
[4 markah]
- CLO1 (c) Explain **TWO (2)** functions of lipid in term of energy.
*Terangkan **DUA (2)** fungsi lipid dari segi tenaga.*
- [4 marks]
[4 markah]

CLO1

- (d) Compound A and B are the examples of lipid. Based on the structure given, determine the name of compound A and B.

Sebatian A dan B adalah contoh lipid. Tentukan nama bagi sebatian A dan B.

Compound/ *Sebatian* ACompound/ *Sebatian* B

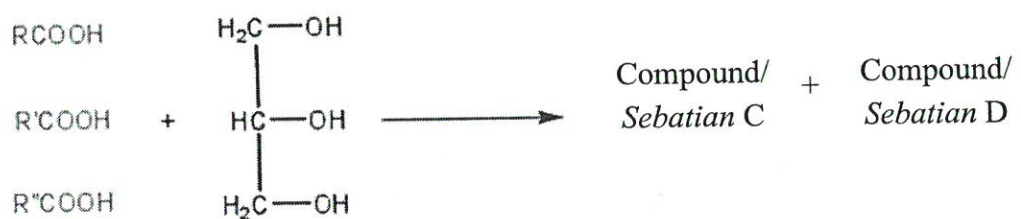
[4 marks]

[4 markah]

CLO1

- (e) Figure 1 (e) shows the condensation reaction between three molecules of fatty acid and one molecule of glycerol backbone. Determine the product of this reaction by sketching the structure C and D.

Rajah 1 (e) menunjukkan tindakbalas kondensasi di antara tiga molekul asid lemak dan satu molekul gliserol. Tentukan produk hasil tindak balas dengan melakarkan struktur C dan D.

Figure 1(e) / *Rajah 1 (e)*

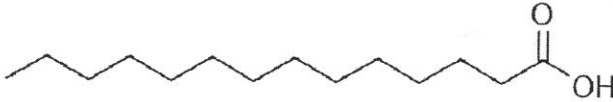
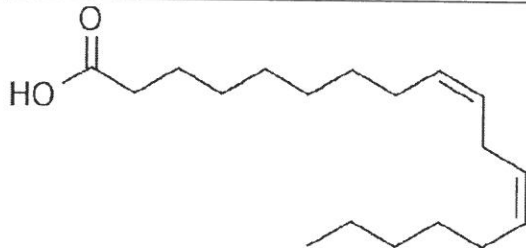
[6 marks]

[6 markah]

QUESTION 2

SOALAN 2

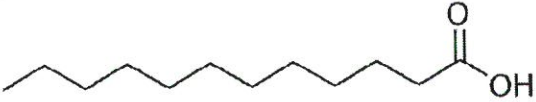
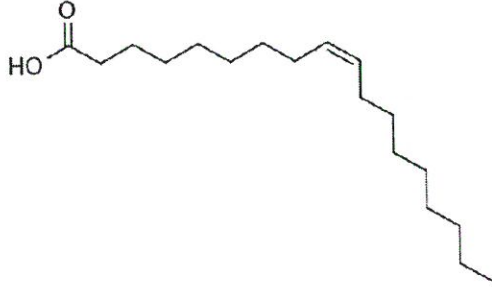
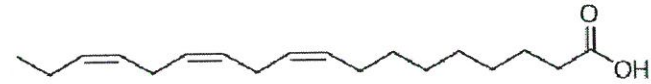
- CLO1 (a) Draw the general structure of fatty acid.
Lukiskan struktur umum bagi asid lemak.
- [2 marks]
[2 markah]
- CLO1 (b) List **FOUR (4)** examples of common unsaturated fatty acid.
Senaraikan EMPAT (4) contoh bagi asid lemak tak tepu biasa.
- [4 marks]
[4 markah]
- CLO1 (c) Explain **TWO (2)** differences between Omega-3 and Omega-6 fatty acid.
Terangkan DUA (2) perbezaan di antara asid lemak Omega-3 dan Omega-6.
- [4 marks]
[4 markah]
- CLO1 (d) Determine the IUPAC names of these **TWO (2)** fatty acids compounds.
Tentukan nama IUPAC bagi DUA (2) sebatian asid lemak ini.

No.	Chemical Structure / Struktur Kimia
1.	
2.	

[4 marks]
[4 markah]

CLO1

- (e) Determine the common names of these **THREE (3)** fatty acids compounds.
Tentukan nama biasa bagi TIGA (3) sebatian asid lemak ini.

No.	Chemical Structure / Struktur Kimia
1.	 <chem>CCCCCCCCCCCCCCCC(=O)O</chem>
2.	 <chem>CCCCCCCCCCCC=CCCCCCCC(=O)O</chem>
3.	 <chem>CCCC=CC=CC=CCCCCCCC(=O)O</chem>

[6 marks]

[6 markah]

QUESTION 3

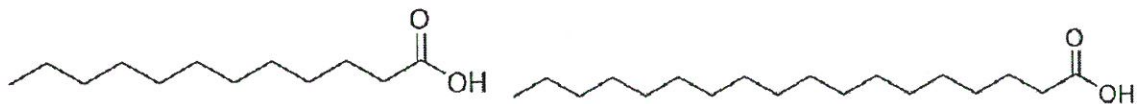
SOALAN 3

- CLO1 (a) List **TWO (2)** sources of oil and fat extracted from the fruit.
Senaraikan DUA (2) sumber minyak dan lemak yang diestrak daripada buah.
[2 marks]
[2 markah]
- CLO1 (b) List **TWO (2)** characteristics and the sources of fat from animals.
Senaraikan DUA (2) ciri-ciri dan sumber lemak daripada haiwan.
[4 marks]
[4 markah]
- CLO1 (c) Determine **TWO (2)** major Triglyceride (TAG) structure that contained in palm oil.
Tentukan DUA (2) struktur Trigliserida (TAG) utama yang terkandung dalam minyak sawit.
[4 marks]
[4 markah]
- CLO1 (d) Determine **TWO (2)** differences between oil and fat.
Terangkan DUA (2) perbezaan antara minyak dan lemak.
[4 marks]
[4 markah]
- CLO1 (e) Tallow is one of the saturated fat sources in food products. Determine **TWO (2)** major fatty acids contained in tallow by sketching both structures.
Tallow adalah salah satu sumber lemak tepu dalam produk makanan. Nyatakan DUA (2) asid lemak utama yang terkandung dalam lemak dengan melakarkan kedua-dua struktur tersebut.
[6 marks]
[6 markah]

QUESTION 4

SOALAN 4

- CLO1 (a) Define physical properties of a substance.
Definisikan sifat fizikal sesuatu bahan.
- [2 marks]
[2 markah]
- CLO1 (b) List **TWO (2)** chemical and physical properties of oil and fat.
Senaraikan DUA (2) sifat kimia dan fizikal bagi minyak dan lemak.
- [4 marks]
[4 markah]
- CLO1 (c) Describe **TWO (2)** factors that affect the physical and chemical properties of oil and fat.
Terangkan DUA (2) faktor yang mempengaruhi sifat fizikal dan kimia minyak dan lemak.
- [4 marks]
[4 markah]
- CLO1 (d) Figure 4(d) shows the chemical structure of fatty acid P and Q. Explain the differences between fatty acid P and Q in term of their refractive index.
Rajah 4 (d) menunjukkan struktur kimia bagi asid lemak P dan Q, Terangkan berbezaan di antara asid lemak P dan Q

Fatty acid/ *Asid lemak* PFatty acid/ *Asid lemak* QFigure 4(d) / *Rajah 4(d)*

[4 marks]

[4 markah]

CLO1

- (e) Compare the physical aspects of canola oil and coconut oil in term of colour, odour, and state in room temperature.

Bandingkan aspek fizikal minyak kanola dan minyak kelapa dari segi warna, bau dan keadaan dalam suhu bilik.

[6 marks]

[6 markah]

QUESTION 5**SOALAN 5**

CLO1

- (a) List **TWO (2)** types of refining processes.

*Senaraikan **DUA (2)** jenis proses penapisan.*

[2 marks]

[2 markah]

CLO1

- (b) Modification of oil and fat will help to improve oxidation stability and alter the melting point of refined oil. List **FOUR (4)** modification processes of oil and fat.

*Pengubahsuaian minyak dan lemak akan membantu meningkatkan kestabilan pengoksidaan dan mengubah takat lebur minyak ditapis. Senaraikan **EMPAT (4)** proses pengubahsuaian minyak dan lemak.*

[4 marks]

[4 markah]

CLO1

- (c) Figure 5 (c) shows the supply chain of palm kernel oil. Explain the processes in R and S.

Rajah 5 (c) menunjukkan rantaian bekalan minyak isirong sawit, terangkan proses dalam R dan S.

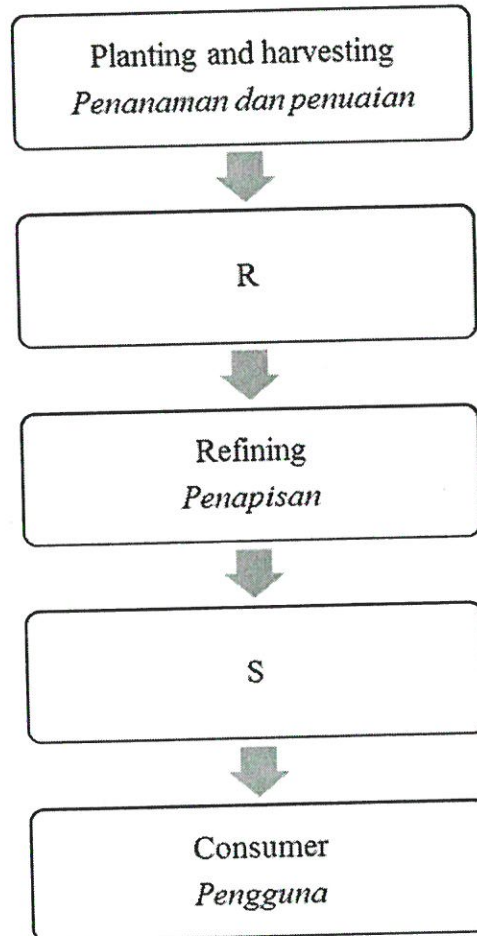


Figure 5 (c) / Supply Chain of Palm Kernel Oil

Rajah 5 (c) Rantaian Bekalan bagi minyak Isirong Sawit

[4 marks]

[4 markah]

CLO1

(d) Figure 5 (d) shows the palm oil milling process flow. Explain the steps labelled as T, U, V and W.

Rajah 5 (d) menunjukkan aliran proses pengilangan kelapa sawit. Terangkan langkah yang ditandakan sebagai T, U, V dan W.

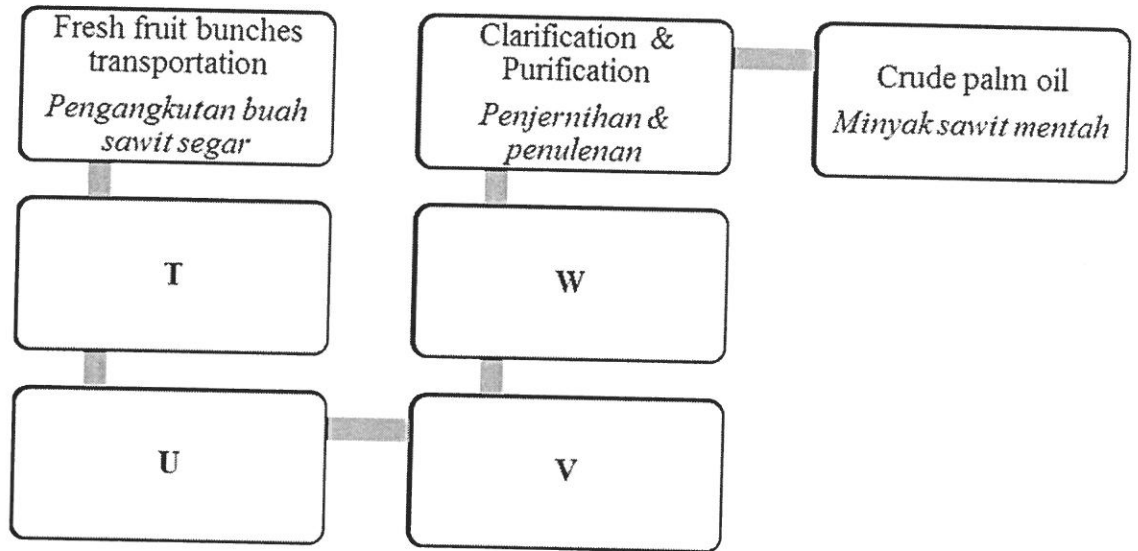


Figure 5 (d). Palm oil Milling Process

Rajah 5 (d). Pemprosesan Minyak Kelapa Sawit

[4 marks]

[4 markah]

CLO1

(e) Figure 5 (e) shows the value chain of palm oil. Discuss TWO (2) activities and products in upstream and downstream stage.

Rajah 5 (e) menunjukkan rantaian nilai minyak sawit. Terangkan DUA (2) aktiviti dan produk di peringkat hulu dan hiliran.

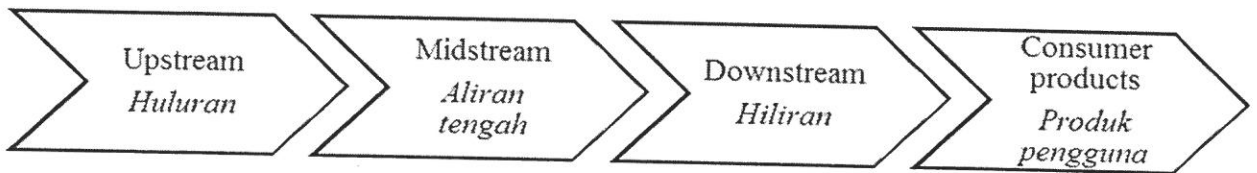


Figure 5 (e) / Rajah 5 (e)

[6 marks]

[6 markah]

SOALAN TAMAT

