

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

DMT20043: ORGANIC CHEMISTRY

TARIKH : 28 DISEMBER 2023

MASA : 2.30 PETANG – 4.30 PETANG (2 JAM)

Kertas ini mengandungi **DUA BELAS (12)** 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. Answer **ALL** questions.

ARAHAN:

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

QUESTION 1**SOALAN 1**

- CLO1 (a) Identify **FIVE (5)** functional groups in the following chemical structure:

*Kenalpasti **LIMA (5)** kumpulan berfungsi dalam struktur kimia yang berikut:*

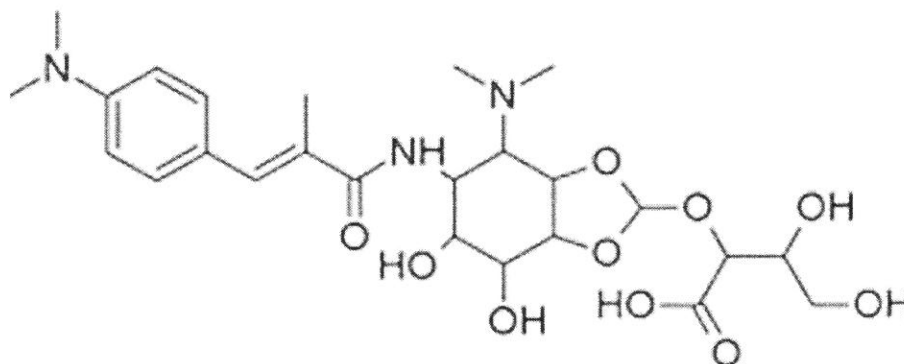


Figure 1(a): Example of a chemical structure

Rajah 1(a): Contoh satu struktur kimia

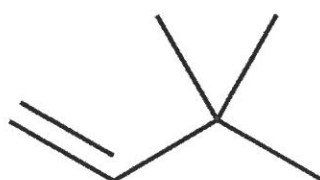
[5 marks]

[5 markah]

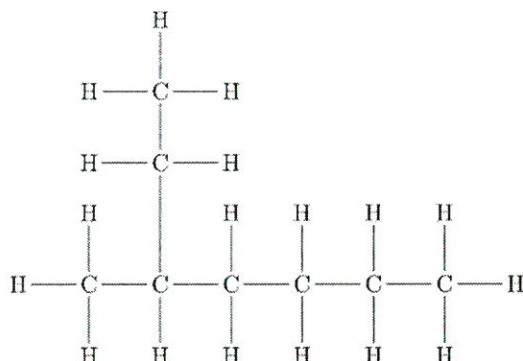
- CLO1 (b) Convert the following compound into condensed structure.

Tukarkan sebatian berikut dalam bentuk struktur yang mampat.

i.



ii.



[5 marks]

[5 markah]

CLO1

- (c) Based on the carbon that has been numbered i to v in Figure 1(c), express each of the following carbon as primary (1°), secondary (2°), tertiary (3°) or quaternary (4°) carbon.

Berdasarkan carbon yang telah dinomborkan i hingga v dalam rajah 1 (c), nyatakan setiap karbon berikut sebagai karbon premier (1°), sekunder (2°), tertier (3°) atau kuantenari (4°)

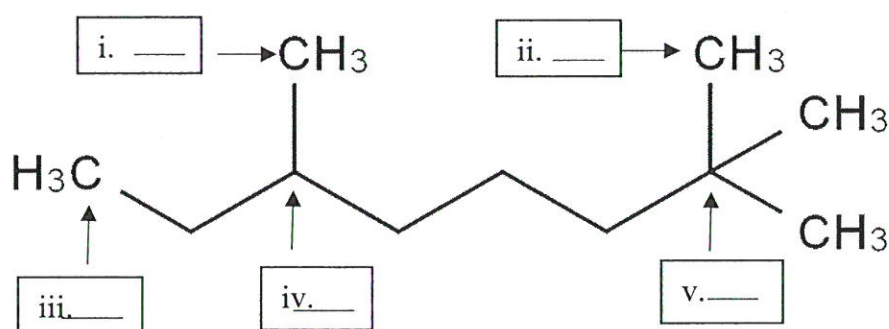


Figure 1(c): Structure of an organic compound
Rajah 1 (c): Struktur bagi satu sebatian organik

[5 marks]

[5 markah]

CLO1

(d) Visualize the chemical structure for the following organic compound:

Gambarkan struktur kimia bagi sebatian organik berikut:

- i. 2-methylbuta-1,3-diene
- ii. 1,1-dimethylcyclopropane

[5 marks]

[5 markah]

QUESTION 2**SOALAN 2**

CLO1

(a) List **FIVE (5)** properties of hydrocarbon.*Senaraikan LIMA (5) sifat hidrokarbon.*

[5 marks]

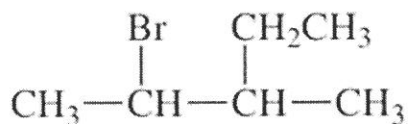
[5 markah]

CLO1

(b) Express the following organic compounds based on IUPAC nomenclature.

Ungkapkan sebatian organik yang berikut berdasarkan sistem penamaan IUPAC.

i.



ii.



[5 marks]

[5 markah]

CLO1

(c) Visualize the structural formula for the following organic compound:

Gambarkan struktur formula bagi sebatian organik yang berikut:

- i. *m*-dibromobenzene
- ii. *p*-chloroaniline

[5 marks]

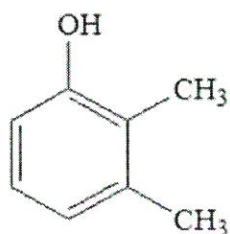
[5 markah]

CLO1

(d) Express the following organic compounds based on IUPAC nomenclature.

Ungkapkan sebatian organik yang berikut berdasarkan sistem penamaan IUPAC.

i.



- ii. $\text{CH}_3\text{CH}_2(\text{CH}_2)_4\text{CH}(\text{Cl})\text{OH}$

[5 marks]

[5 markah]

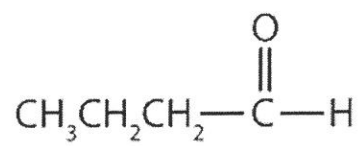
QUESTION 3**SOALAN 3**

CLO1

(a) Identify the following organic compound structure either aldehyde or ketone.

Kenal pasti struktur sebatian organik yang berikut sama ada aldehid atau keton.

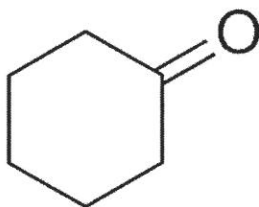
i.



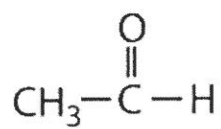
ii.



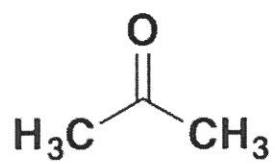
iii.



iv.



v.



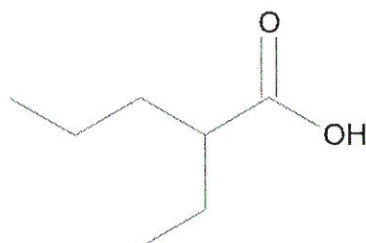
[5 marks]
[5 markah]

CLO1

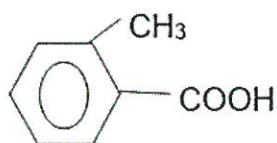
(b) Interpret the following organic compounds based on IUPAC nomenclature.

Tafsirkan sebatian organik yang berikut berdasarkan sistem penamaan IUPAC.

i.



ii.



[5 marks]

[5 markah]

CLO1

(c) Visualize the structural formula for the following organic compound:

Gambarkan struktur formula bagi sebatian organik yang berikut:

i. N,N-diethylethanamine

ii. 3-bromocyclohexanamine

[5 marks]

[5 markah]

CLO1

- (d) Compare between the primary amines and secondary amines by drawing an example for each.

Bandingkan antara amina premier dan amina sekunder dengan melukis satu contoh struktur bagi setiap satu.

[5 marks]

[5 markah]

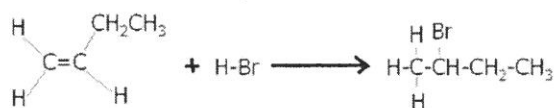
QUESTION 4**SOALAN 4**

CLO1

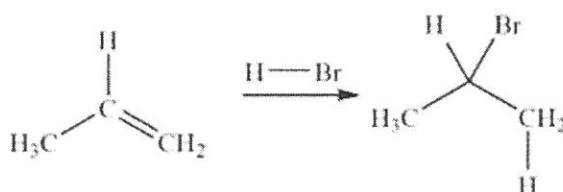
- (a) Based on the following reaction, identify either it follows markovnikov rule or anti markovnikov.

Berdasarkan tindak balas yang berikut kenalpasti sama ada ianya mengikut peraturan markovnikov atau anti markovnikov.

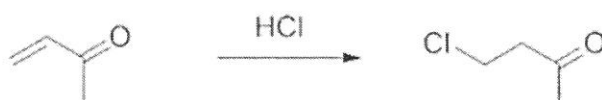
i.



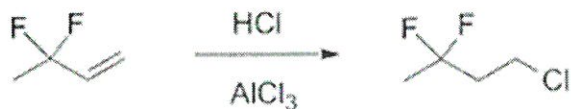
ii.



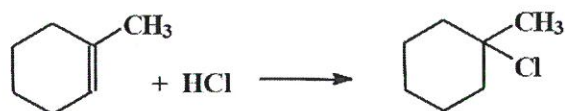
iii.



iv.



v.



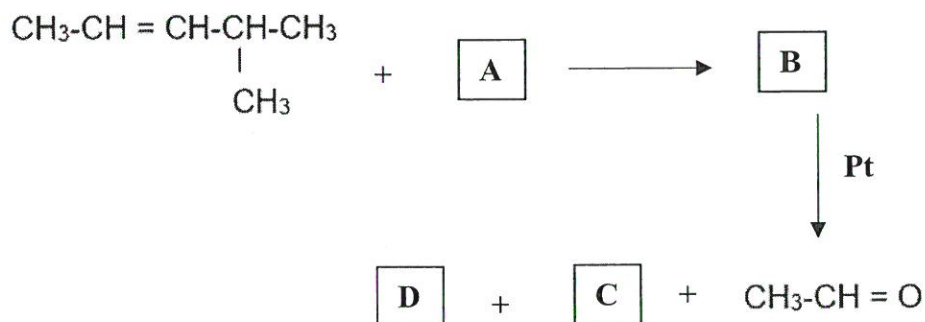
[5 marks]

[5 markah]

CLO1

- (b) Ozonolysis is a reaction occurs when alkene combines with ozone to form ozonide compound. Ozonide compound is then reduced by using catalyst to form aldehyde or ketone. Express A, B, C and D by completing the ozonolysis reaction below.

Ozonolisis adalah tindak balas yang berlaku apabila alkena bergabung dengan ozon menghasilkan sebatian ozonida. Sebatian ozonida kemudiannya diturunkan dengan pemangkin menjadi aldehyd atau keton. Nyatakan A, B, C dan D dengan melengkapkan tindak balas ozonolysis dibawah.



[7 marks]

[7 markah]

CLO1

- (c) Based on Figure 4(c), the equation shows the organic compound 2-bromo-2-methylpropane undergoes S_N1 nucleophilic substitution mechanisms with hydroxide ion (OH^-). Detail the steps involved for this substitution reaction.
- Berdasarkan rajah 4(c), persamaan tersebut menunjukkan sebatian organik 2-bromo-2metilpropana mengalami mekanisma penggantian nukleofilik dengan ion hidroksida (OH^-). Perincikan langkah-langkah yang terlibat bagi tindak balas penggantian ini.*



Figure 4(c): S_N1 nucleophilic substitution for 2-bromo-2-methylpropane equation

Rajah 4(c): Persamaan penggantian nukleofilik S_N1 bagi 2-bromo-2metilpropana

[8 marks]

[8 markah]

QUESTION 5

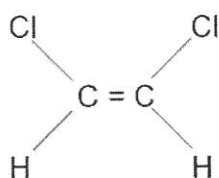
SOALAN 5

CLO1

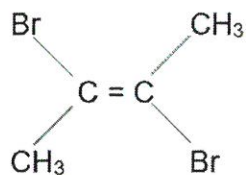
- (a) Identify each of the following compound as cis, trans, Z or E isomer based on the Cahn-Ingold Prelog System.

Kenalpasti setiap sebatian berikut sebagai isomer cis, trans, Z atau E berdasarkan Sistem Prelog Cahn-Ingold. (Atomic no; H=1, C=6, O=8, Cl=17, Br=35)

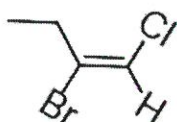
i.



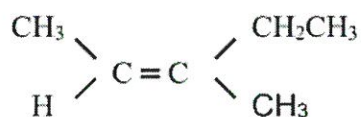
ii.



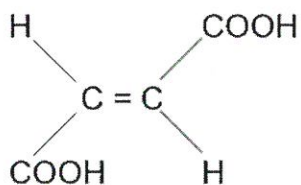
iii.



iv.



v.



[5 marks]

[5 markah]

CLO1

- (b) Compound X has molecular formula of C_5H_{12} . This compound can form isomer with the same molecular formula.

Sebatian X mempunyai formula molekul C_5H_{12} . Sebatian ini boleh membentuk isomer dengan formula molekul yang sama.

- i) Express the types of isomer.

Ungkapkan jenis-jenis isomer.

[1 mark]

[1 markah]

- ii) Visualize **THREE (3)** possible structures-mp of the isomer formed by compound X.

*Gambarkan **TIGA (3)** struktur yang mungkin bagi isomer yang dibentuk dengan menggunakan sebatian X.*

[6 marks]

[6 markah]

CLO1

- (c) Hexane has the molecular structure of $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$. Visualize the Newman projection (Staggered conformation) based on the carbon view below.
Heksana mempunyai struktur molecular $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$. Gambarkan projeksi Newmann (konformasi Staggered) berdasarkan pandangan karbon yang berikut.

- i) C1-C2
- ii) C2-C3
- iii) C3-C4
- iv) C5-C6

[8 marks]

[8 markah]

SOALAN TAMAT

