

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

DMT20043 : ORGANIC CHEMISTRY

TARIKH : 10 DISEMBER 2024

MASA : 11.30 PAGI – 1.30 PETANG (2 JAM)

Kertas soalan ini mengandungi **SEBELAS (11)** halaman bercetak.

Subjektif (4 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)** questions. Answer **ALL** questions.

ARAHAN:

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

QUESTION 1**SOALAN 1**

- CLO1 (a) Identify **FIVE (5)** functional groups for chemical structure in the Diagram 1 (a) below.

*Kenalpasti **LIMA (5)** kumpulan berfungsi bagi struktur kimia dalam Rajah 1 (a) di bawah.*

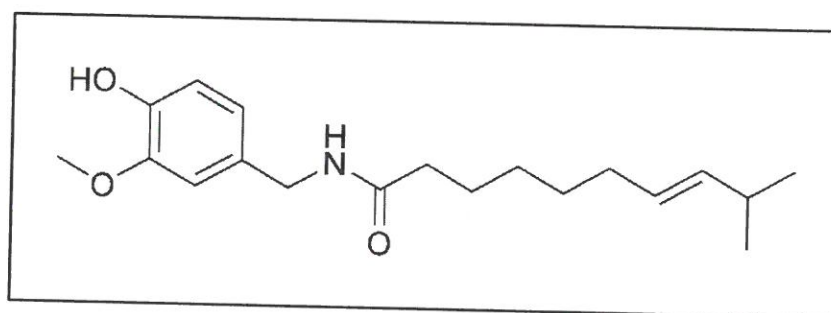


Diagram 1 (a) / Rajah 1 (a)

[5 marks]

[5 markah]

- CLO1 (b) i. Explain the differences between saturated and unsaturated organic compounds together with example.

Terangkan perbezaan diantara sebatian organik tepu dan tidak tepu beserta dengan contoh.

[6 marks]

[6 markah]

- ii. Illustrate **ONE (1)** example of saturated and unsaturated organic compounds.

*Ilustrasikan **SATU (1)** contoh bagi sebatian organik tepu dan tidak tepu.*

[4 marks]

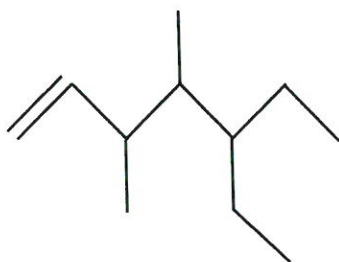
[4 markah]

CLO1

- (c) Express the IUPAC name for the following compounds.

Zahirkan nama IUPAC bagi sebatian berikut.

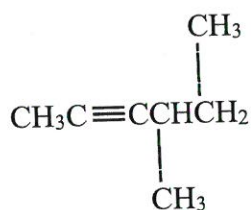
i.



[3 marks]

[3 markah]

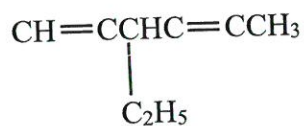
ii.



[3 marks]

[3 markah]

iii.



[4 marks]

[4 markah]

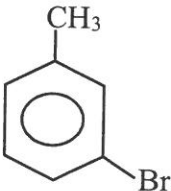
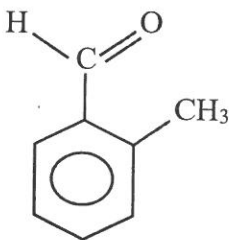
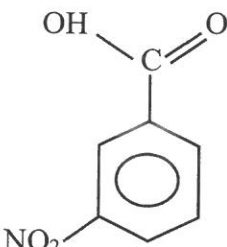
QUESTION 2

SOALAN 2

CLO1

- (a) Compounds that are made from benzene are called benzene derivatives that substitute one or more of the hydrogen atoms with another compound or functional group. Identify the type of benzene derivatives in Table 2 (a) below.
- Sebatian yang diperbuat daripada benzena dipanggil terbitan benzene yang menggantikan satu atau lebih atom hidrogen dengan sebatian atau kumpulan berfungsi yang lain. Kenalpasti jenis terbitan benzina dalam Jadual 2 (a) di bawah.*

Table 2 (a) / Jadual 2 (a)

Molecular Structure <i>Struktur Molekul</i>	Benzene Derivatitives <i>Terbitan Benzina</i>
i. 	
ii. 	
iii. 	

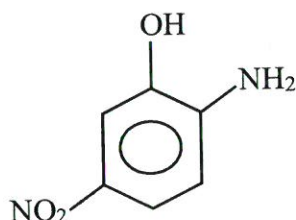
[5 marks]

[5 markah]

CLO1

- (b) Express the following molecules by using the IUPAC nomenclature system.
Zahirkan sebatian berikut dengan menggunakan sistem penamaan IUPAC.

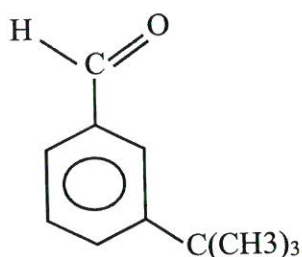
i.



[3 marks]

[3 markah]

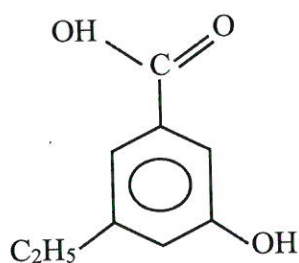
ii.



[3 marks]

[3 markah]

iii.



[4 marks]

[4 markah]

CLO1

- (c) Carbonyl compounds are organic compounds that contain a carbonyl group, which is a functional group characterized by a carbon atom double-bonded to an oxygen atom (C=O). Illustrate the structural formula for the following carbonyl compounds.
Sebatian karbonil ialah sebatian organik yang mengandungi kumpulan karbonil, iaitu kumpulan berfungsi yang dicirikan oleh atom karbon terikat dua kali ganda pada atom oksigen (C=O). Ilustrasikan struktur formula bagi sebatian karbonil berikut.

- i. 4-ethyl-6-hydroxy-3-methyl-hexanal
4-etil-6-hidroksi-3-metil-heksanal
[3 marks]
[3 markah]
- ii. 3,3-diethyl-4-methylcyclopentanone
3,3-dietil-4-metillsiklopentanon
[3 marks]
[3 markah]
- iii. 5-chloro-2-methylcyclohexanecarbaldehyde
5-kloro-2-metilsikloheksanakarbaldehyd
[4 marks]
[4 markah]

QUESTION 3

SOALAN 3

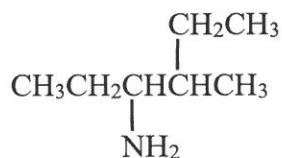
- CLO1 (a) Carboxylic acid is an organic acid that contains one or more carboxyl groups as functional groups. Identify **FIVE (5)** uses of organic acid.
Asid karboksilik ialah asid organik yang mengandungi satu atau lebih kumpulan karboksil sebagai kumpulan berfungsi. Kenalpasti LIMA (5) kegunaan asid organik.
- [5 marks]
[5 markah]
- CLO1 (b) Illustrate the structural formula for the following compounds.
Ilustrasikan formula struktur bagi sebatian berikut.
- i. 2-fluoro-4-hydroxypentanoic acid
2-fluoro-4-hidroksipentanoik asid
- [3 marks]
[3 markah]
- ii. 3-ethyl-4-nitro-4-hexenoic acid
3-etil-4-nitro-4-heksenoik asid
- [3 marks]
[3 markah]
- iii. 2-methyl-1,4-cyclohexanedioic acid
2-metil-1,4-sikloheksanadioik asid
- [4 marks]
[4 markah]

CLO1

- (c) An amine is an organic compound derived from ammonia (NH_3) by replacing one or more hydrogen atoms with alkyl or aryl groups. Amines are classified into **THREE (3)** categories based on the number of alkyl or aryl groups attached to the nitrogen atom. Classify the following amine with its name by using the IUPAC nomenclature system.

*Amina ialah sebatian organik yang terhasil daripada ammonia (NH_3) dengan menggantikan satu atau lebih atom hidrogen dengan kumpulan alkil atau aril. Amina dikelaskan kepada **TIGA (3)** kategori berdasarkan bilangan kumpulan alkil atau aril yang melekat pada atom nitrogen. Kelaskan amina berikut dengan namanya menggunakan sistem tatanama IUPAC.*

i.



[3 marks]

[3 markah]

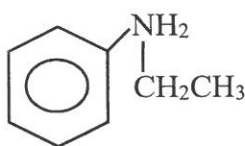
ii.



[3 marks]

[3 markah]

iii.



[4 marks]

[4 markah]

QUESTION 4

SOALAN 4

CLO1

- (a) Indicate whether the statement about reaction in organic chemistry in Table 4 (a) is true or false.

Nyatakan sama ada pernyataan mengenai tindak balas dalam kimia organik dalam Jadual 4 (a) adalah benar atau salah.

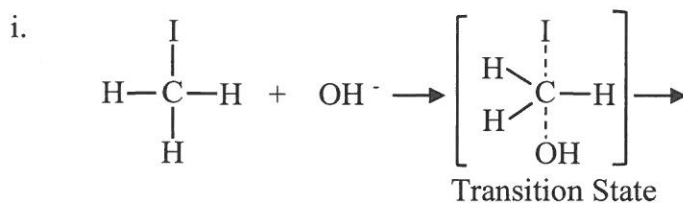
Table 4 (a) / Jadual 4 (a)

Statements / Pernyataan	Answer / Jawapan
i. Addition reaction often occurs in unsaturated compounds such as alkenes and alkynes. <i>Tindak balas penambahan sering berlaku dalam sebatian tak tepu seperti alkena dan alkuna.</i>	
ii. A combustion reaction is an example of an addition reaction. <i>Tindak balas pembakaran adalah salah satu contoh tindak balas penambahan.</i>	
iii. Substitution reaction occurs when 1 atom or 1 molecule is removed to form another molecule. <i>Tindak balas penggantian berlaku apabila 1 atom atau 1 molekul dikeluarkan untuk membentuk molekul lain.</i>	
iv. Free radicals are one example of a substitution reaction. <i>Radikal bebas adalah salah satu contoh tindak balas penukargantian.</i>	
v. The S_N2 reaction occurs in 2 steps. <i>Tindak balas S_N2 berlaku dalam 2 langkah.</i>	

[5 marks]

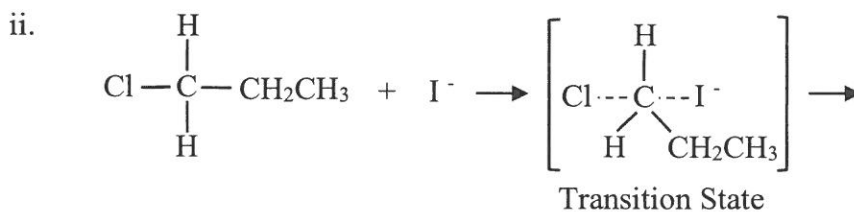
[5 markah]

CLO1

(b) Shows the complete S_N2 mechanism for the following reaction.*Tunjukkan mekanisme S_N2 lengkap bagi tindak balas berikut.*

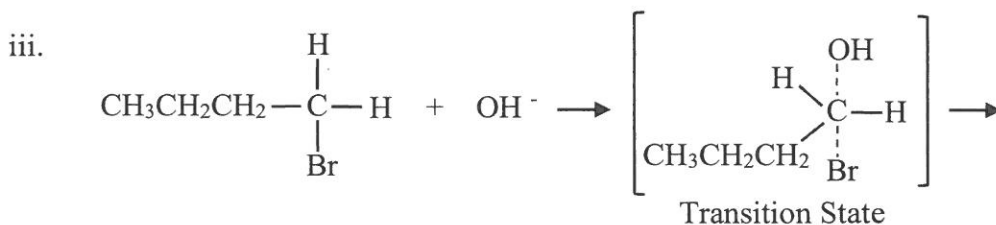
[3 marks]

[3 markah]



[3 marks]

[3 markah]



[4 marks]

[4 markah]

CLO1

(c) Illustrate the structural formula for the following compounds.

Ilustrasikan formula struktur untuk sebatian di bawah.

i. cis-3,4-dimethylhex-3-ene

cis-3,4-dimetilheks-3-ena

[3 marks]

[3 markah]

- ii. (Z)-2-bromo-1-iodoprop-1-ene
(Z)-2-bromo-1-iodoprop-1-ena

[3 marks]

[3 markah]

- iii. (E)-1-bromo-1-iodo-2-methylbut-1-ene
(E)-1-bromo-1-iodo-2-metilbut-1-ena

[4 marks]

[4 markah]

SOALAN TAMAT