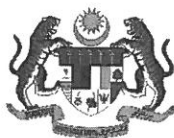


SULIT



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 1 : 2024/2025

DMT20313: CHEMISTRY 2

TARIKH : 04 DISEMBER 2024

MASA : 2.30 PETANG – 4.30 PETANG (2 JAM)

Kertas ini mengandungi **TUJUH (7)** 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 **FOUR (4)** questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan. Jawab SEMUA soalan.

QUESTION 1**SOALAN 1**

- CLO1 (a) Indicate the definition of oxidation and reduction reaction.

Nyatakan definisi untuk tindak balas pengoksidaan dan pengurangan.

[4 marks]

[4 markah]

CLO1

- (b) Diagram 1(b) shows the unbalanced ionic equation. Rewrite the complete balanced equation in Diagram 1(b).

Rajah 1(b) menunjukkan persamaan ion tidak seimbang. Tuliskan semula cara melengkapkan persamaan seimbang dalam rajah 1(b).

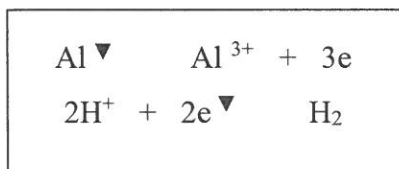


Diagram 1(b)/ Rajah 1(b)

[6 marks]

[6 markah]

CLO1

- (c) $\text{CO}_3^{2-} + \text{H}_2\text{SO}_4 \nabla \qquad \text{HCO}_3^- + \text{HSO}_4^-$

- i) Based on the equation above, calculate the oxidation number of atom carbon as in ion CO_3^{2-} and HCO_3^- (Oxidation number : H= 1, O = -2,)

Berdasarkan persamaan di atas, kirakan nombor pengoksidaan atom karbon di dalam ion CO_3^{2-} dan HCO_3^- . (Nombor pengoksidaan : H= 1, O = -2)

[7 marks]

[7 markah]

- ii. Calculate the oxidation number of sulfur atoms in the molecule H_2SO_4 and ion HSO_4^- . (Oxidation number : H = 1, O = -2,).
Kirakan nombor pengoksidaan atom sulfur di dalam sebatian H_2SO_4 dan ion HSO_4^- . (Nombor pengoksidaan : H = 1, O = -2).

[8 marks]
 [8 markah]

QUESTION 2

SOALAN 2

- CLO1 (a) Indicate the definition of homogenous state and heterogenous state.
Nyatakan definisi untuk keadaan homogen dan keadaan heterogen.
- [4 marks]
 [4 markah]
- CLO1 (b) Explain **THREE (3)** factors that affect the rate of reaction.
*Terangkan **TIGA (3)** faktor-faktor yang memberi kesan kepada kadar tindak balas.*
- [6 marks]
 [6 markah]
- CLO1 (c) At equilibrium and at temperature 230 °C, the concentrations of the compounds in the equation are $[NO] = 0.0542 \text{ M}$, $[O_2] = 0.127 \text{ M}$ and $NO_2 = 15.5 \text{ M}$.
Pada keseimbangan dan pada suhu 230 °C kepekatan sebatian dalam persamaan ialah $[NO] = 0.0542 \text{ M}$, $[O_2] = 0.127 \text{ M}$ dan $NO_2 = 15.5 \text{ M}$.
- $$\rightleftharpoons 2NO(g) + O_2 \qquad 2NO_2$$
- i) Calculate the equilibrium constant, K_c for the reaction
Kirakan pemalar keseimbangan, K_c bagi tindak balas tersebut
- [10 marks]
 [10 markah]

- ii) Draw the equilibrium graph for concentration against time that represents the reaction.

Lukiskan graf keseimbangan bagi kepekatan lawan masa yang mewakili tindak balas tersebut.

[5 marks]
[5 markah]

QUESTION 3

SOALAN 3

CLO1

- (a) Identify **FOUR (4)** functional groups in the Diagram 3(a).

*Kenalpasti **FOUR (4)** kumpulan berfungsi dalam rajah 3(a).*

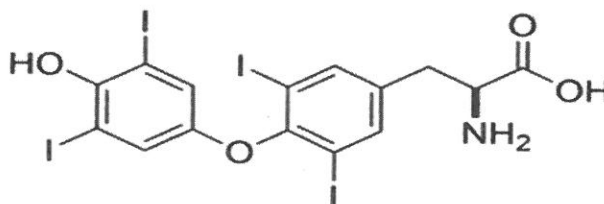


Diagram 3(a): Example of a chemical structure

Rajah 3(a): Contoh satu struktur kimia

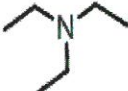
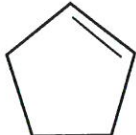
[4 marks]
[4 markah]

CLO1

- (b) Classify homologues series for the compound.

Klasifikasi siri homolog bagi sebatian berikut.

Organic Compound / Sebatian organic	Homologous Series / Siri homolog
$\begin{array}{c} \text{Br} \text{ CH C} \equiv \text{CH} \\ \\ \text{Br} \end{array}$	

$ \begin{array}{c} \text{CH}_3 \\ \\ \text{HOOC}-\text{C}-\text{COOH} \\ \\ \text{CH}_3 \end{array} $	
$ \begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{OH} \\ \\ \text{CH}_3 \end{array} $	
$ \begin{array}{cccc} \text{H} & \text{H} & \text{H} & \text{H} \\ & & & \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & & \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array} $	
	
	

[6 marks]
[6 markah]

CLO1

- (c) Diagram 3(c) shows the structure of an organic compound.
Rajah 3 (c) menunjukkan struktur untuk satu sebatian organik.

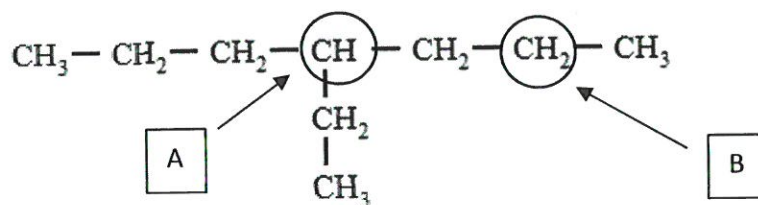


Diagram 3(c): Structure of an organic compound

Rajah 3 (c): Struktur bagi satu sebatian organik

- i. Based on the diagram 3(c), drawing up the skeletal structure of the organic compound.

Berdasarkan rajah 3(c), lukiskan struktur rangka bagi sebatian organik tersebut.

[5 marks]
[5 markah]

- ii. Solve the IUPAC nomenclature of the organic compounds based on Diagram 3(c).

Selesaikan penamaan IUPAC bagi sebatian organik berdasarkan Rajah 3(c).

[4 marks]
[4 markah]

- iii. Verify the classification of each of the following carbon in the circle on diagram 3(c).

Sahkan pengelasan setiap karbon berikut dalam bulatan pada rajah 3(c).

[6 marks]
[6 markah]

QUESTION 4

SOALAN 4

CLO1

- (a) In the IUPAC naming system, the chemical name of an organic compound has three parts: prefix, parent and suffix. From diagram 4(a), identify the prefix, parent and suffix for the compound as follows.

Dalam penamaan sistem IUPAC, nama kimia bagi sebatian organik mempunyai tiga bahagian; prefiks, induk dan suffiks. Daripada rajah 4(a), labelkan prefix, parent and suffix bagi sebatian berikut.

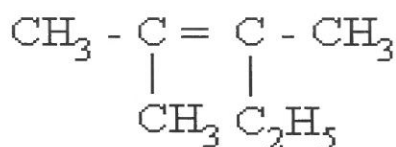


Diagram 4(c): Structure of an organic compound

Rajah 4 (c): Struktur bagi satu sebatian organik

[4 marks]
[4 markah]

CLO1

- (b) Express the names for the following compounds based on the IUPAC nomenclature system.

Zahirkan nama bagi sebatian berikut mengikut sistem penamaan IUPAC.

Compound / <i>Sebatian</i>	IUPAC name of compound/ <i>Nama IUPAC sebatian</i>
$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{OH} \\ \\ \text{CH}_3 \end{array}$	
$\begin{array}{c} \text{O} \qquad \qquad \text{CH}_3 \\ \qquad \qquad \\ \text{HO} - \text{C} - \text{CH}_2 - \text{CH} = \text{CH} - \text{CH} - \text{CH}_3 \end{array}$	
$\begin{array}{c} \text{H} \qquad \qquad \text{CH}_2 - \text{COOH} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{HOOC} - \text{CH}_2 \qquad \text{H} \end{array}$	

[6 marks]

[6 markah]

CLO1

- (c) Draw the structural formula for the following compounds

Lukiskan formula struktur bagi sebatian berikut.

- (i) 2,3-dimethylpent-3-en-2-ol

[5 marks]

[5 markah]

- (ii) 2-ethyl-3,3-dimethylhexanoic acid

[5 marks]

[5 markah]

- (iii) 5-ethyl-2-isopropyl-3-heptynoic acid

[5 marks]

[5 markah]

SOALAN TAMAT