

MODUL KENYALANG CEMERLANG SPM TAHUN 2022

JABATAN PENDIDIKAN NEGERI SARAWAK

**KIMIA 4541
KERTAS 1
SET 2**

PENGENALAN

Program Semarak Kasih yang dilaksanakan pada tahun 2020 telah mendapat sambutan yang menggalakkan daripada warga pendidik dan murid, khasnya calon SPM 2020. Sehubungan dengan itu, pada tahun 2021 ini, Sektor Pembelajaran, Jabatan Pendidikan Negeri Sarawak mengadakan **Modul Kenyalang Cemerlang** untuk membantu guru dan calon SPM menghadapi peperiksaan SPM 2022.

Modul yang dihasilkan disertakan dengan sampel Jadual Spesifikasi Ujian (JSU) dan sampel item/soalan mengikut format baharu peperiksaan SPM mulai 2021 untuk dijadikan bahan panduan dan rujukan guru-guru dan juga sebagai bahan latihan/ulangkaji kepada calon-calon SPM 2022 di semua sekolah menengah di negeri Sarawak.

OBJEKTIF PROGRAM

1. Memastikan calon SPM menguasai format baharu Peperiksaan SPM 2022.
2. Memastikan calon SPM mempunyai bahan pembelajaran yang berfokus ke arah peperiksaan SPM.
3. Meningkatkan pencapaian akademik calon SPM 2022.
4. Melonjakkan keputusan SPM 2022 Negeri Sarawak

SENARAI KANDUNGAN

Bil.	Perkara	Muka surat
1	Format Kertas Peperiksaan SPM Mulai Tahun 2021	2
2	Latihan - Praktis Kimia 4541/1: Set 2	3 – 18
3	Skema Jawapan/Pemarkahan	19
4	LAMPIRAN: Sampel Jadual Spesifikasi Ujian (JSU) untuk Praktis Kimia 4541/1: Set 2	20 - 21

SENARAI AHLI PANEL PEMBINA MODUL KENYALANG CEMERLANG SPM

Bil.	Nama Guru	Sekolah	PPD
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2.	Bella Mahony Sie	SMK Luar Bandar Sibu	SIBU
3.	Fun Ngik Ngon	SMK Bandar Sibu	SIBU
4.	Goh Leh Ling	SMK Sacred Heart	SIBU
5.	Hii Sian Kiong	SMK Sibu Jaya	SIBU
6.	Ling Mee Ling	SMK St Elizabeth	SIBU
7.	Ling Teck Ping	SMK Tung Hua	SIBU
8.	Wong Kee Ping	SMK Bukit Assek	SIBU
9.	Yap Liew Yiing	SMK Tiong Hin	SIBU
10.	Tie Woon Yen	SMK Bandar Bintulu	BINTULU
11.	Law Hui Nong	SMK Tinggi Sarikei	SARIKEI
12.	Victoria Petrus	SMK Tun Abdul Razak	SERIAN
13.	Chien Hui Siong	SMK Tinggi Sarikei	SARIKEI

PENYELARAS

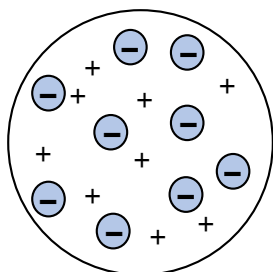
Bil.	Nama Pegawai	Stesen Bertugas
1	Haslina binti Marzoki	Unit Sains dan Matematik, JPN Sarawak

**FORMAT INSTRUMEN PEPERIKSAAN SPM MULAI TAHUN 2021
BAGI MATA PELAJARAN KIMIA (KOD: 4541)**

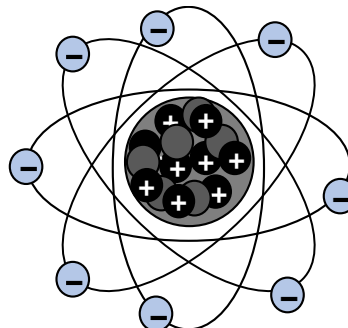
BIL	PERKARA	KERTAS 1 (4541/1)	KERTAS 2 (4541/2)	KERTAS 3 (4541/3)
1	Jenis Instrumen	Ujian Bertulis		Ujian Amali
2	Jenis Item	Objektif Aneka Pilihan	• Subjektif Berstruktur • Subjektif Respons Terhad • Subjektif Respons Terbuka	Subjektif Berstruktur
3	Bilangan Soalan	40 soalan (40 markah) (Jawab semua soalan)	Bahagian A: • 8 soalan (60 Markah) (Jawab semua soalan) • Bahagian B: (20 Markah) • 2 soalan (Jawab 1 soalan) Bahagian C: (20 Markah) • 1 soalan	3 item (Jawab mengikut subjek yang didaftar)
4	Jumlah Markah	40 markah	100 markah	15 markah bagi setiap item
5	Konstruk	• Mengingat • Memahami • Mengaplikasi • Menganalisis	• Mengingat • Memahami • Mengaplikasi • Menganalisis • Menilai • Mencipta	Kemahiran proses sains
6	Tempoh Ujian	1 jam 15 minit	2 jam 30 minit	40 minit + 5 minit setiap item (5 minit: sesi merancang) (40 minit: masa menjawab soalan)
7	Cakupan Konteks	Standard kandungan dan standard pembelajaran dalam Dokumen Standard Kurikulum dan Pentaksiran (DSKP) KSSM (Tingkatan 4 dan 5)		
8	Aras Kesukaran	Rendah : Sederhana : Tinggi 5 : 3 : 2		
9	Kaedah Penskoran	Dikotomus	Analitikal	
10	Alat Tambahan	Kalkulator saintifik		

PRAKTIS KIMIA 4541/1**SET 2**

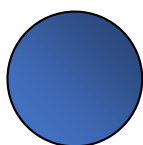
1. Antara pasangan berikut, yang manakah betul mengenai perkembangan model atom?
Which of the following pairs is correct about the development of the atomic model?

A

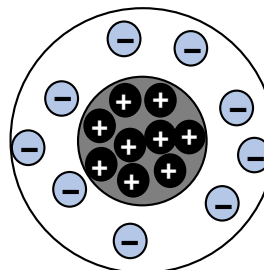
Ernest Rutherford

C

James Chadwick

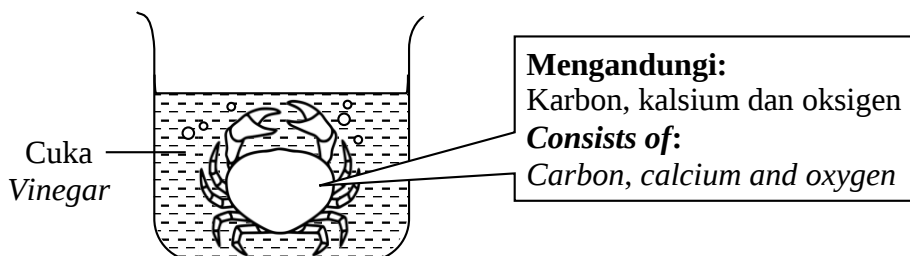
B

Neils Bohr

D

J.J. Thomson

2. Rajah 1 menunjukkan seekor ketam yang diletakkan dalam sebuah bikar yang berisi cuka.
Diagram 1 shows a crab placed in a beaker filled with vinegar.



Rajah 1 / Diagram 1

Suatu ion dalam cuka bertindak balas dengan cangkerang ketam untuk menghasilkan gas karbon dioksida. Apakah ion itu?

An ion in vinegar reacts with the crab shell to produce carbon dioxide gas. What is the ion?

- A** Ca^{2+}
B CO_3^{2-}

- C** H^+
D OH^-

3. Antara berikut, yang manakah **bukan** sifat logam peralihan?
Which of the following is **not** a property of the transition metals?

- A Membentuk sebatian berwarna.
Form coloured compounds.
- B Mempunyai pelbagai keadaan pengoksidaan.
Have various oxidation states.
- C Unsur dan sebatianannya adalah mangkin yang baik.
Their elements and compounds are good catalysts.
- D Mempunyai takat lebur yang tinggi tetapi ketumpatan rendah.
Have high melting points but low densities.

4. Antara yang berikut, yang manakah benar tentang perbezaan minyak dengan lemak?
Which of the following is true about the difference between oils and fats?

	Minyak <i>Oils</i>	Lemak <i>Fats</i>
A	Berbentuk pepejal pada suhu bilik <i>Solid form at room temperature</i>	Berbentuk cecair pada suhu bilik <i>Liquid form at room temperature</i>
B	Diperoleh daripada tumbuhan <i>Obtained from plants</i>	Diperoleh daripada haiwan <i>Obtained from animals</i>
C	Asid lemak tepu <i>Saturated fatty acids</i>	Asid lemak tak tepu <i>Unsaturated fatty acids</i>
D	Takat lebur tinggi <i>High melting point</i>	Takat lebur rendah <i>Low melting point</i>

5. Apakah monomer bagi getah asli?
What is the monomer for natural rubber?

- A Asid amino
Amino acid
- B Stirena
Styrene
- C Isoprena
Isoprene
- D Glukosa
Glucose

6. Mengapakah karbon-12 dipilih sebagai atom piawai untuk menentukan jisim atom relative?
Why carbon-12 is chosen as the standard atom to determine relative atomic mass?

- A Ia tidak mudah digabungkan dengan elemen lain
It does not combine easily with other elements
- B Ia mempunyai banyak isotop dan banyak peratus kelimpahan
It has many isotopes with many percentage of abundance
- C Ia adalah atom paling ringan
It is the lightest atom
- D Ia adalah pepejal pada suhu bilik dan mudah dikendalikan
It is a solid at room temperature and can be handled easily

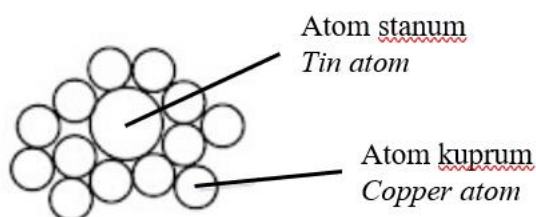
7. Rajah 2 menunjukkan buah yang mengandungi sebatian R yang berbau buah-buahan.
Diagram 2 shows the fruit that contains compound R which smells fruity.



Rajah 2 / Diagram 2

Apakah siri homolog bagi sebatian R?
What is the homologous series of compound R?

- | | |
|---|------------------------------------|
| A Asid karboksilik
<i>Carboxylic acid</i> | C Alkohol
<i>Alcohol</i> |
| B Ester
<i>Ester</i> | D Alkena
<i>Alkene</i> |
8. Rajah 3 menunjukkan susunan atom aloi Q.
Diagram 3 shows the arrangement of atoms in alloy Q.



Rajah 3 / Diagram 3

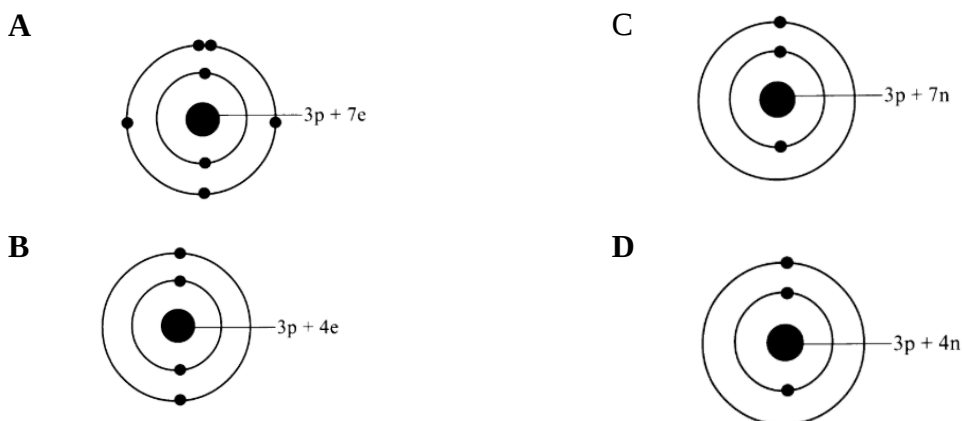
Apakah nama aloi Q?
What is the name of alloy Q?

- | | |
|----------------------------------|--|
| A Pateri
<i>Solder</i> | C Keluli nirkarat
<i>Stainless steel</i> |
| B Gangsa
<i>Bronze</i> | D Pewter
<i>Pewter</i> |

9. Maklumat berikut adalah mengenai atom S.
The following information is about atom S.

- Bilangan proton ialah 3
Number of proton is 3
- Nombor nukleon ialah 10
Nucleon number is 10

Rajah yang manakah menunjukkan struktur atom bagi S?
Which diagram shows the atomic structure of S?



10. Antara pernyataan berikut yang manakah benar tentang pengoksidaan dan penurunan?
Which of the following is true about oxidation and reduction?

	Pengoksidaan Oxidation	Penurunan Reduction
A	Menerima oksigen Gain of oxygen	Kehilangan hidrogen Loss of hydrogen
B	Kehilangan oksigen Loss of oxygen	Menerima hidrogen Gain of hydrogen
C	Kehilangan electron Loss of electrons	Menerima proton Gain of proton
D	Pertambahan nombor pengoksidaan Increase in oxidation number	Penurunan nombor pengoksidaan Decrease in oxidation number

11. Antara yang berikut, ikatan yang manakah terdapat dalam ion ammonium, NH_4^+ ?
Which of the following bonds are found in ammonium ion, NH_4^+ ?

- | | |
|---------------------------------------|--|
| I Ikatan ion
Ionic bond | III Ikatan kovalen
Covalent bond |
| II Ikatan datif
Dative bond | IV Ikatan hydrogen
Hydrogen bond |
| A I dan II
I and II | C I dan III
I and III |
| B II dan III
II and III | D II dan IV
II and IV |

12. Yang manakah bukan satu ciri grafen?

Which is not a feature of graphene?

A Lutsinar
Transparent

B Telap
Permeable

C Konduktor elektrik yang baik
Very good conductor of electricity

D Sangat kuat dan keras
Very strong and hard

13. Jadual 1 menunjukkan nombor proton bagi atom=atom W, X, Y dan Z.

Table 1 shows the proton number of atoms W, X, Y and Z.

Atom / Atom	Nombor proton <i>Proton number</i>	Nombor nukleon <i>Nucleon number</i>
W	6	12
X	8	16
Y	12	24
Z	35	80

Jadual 1 / Table 1

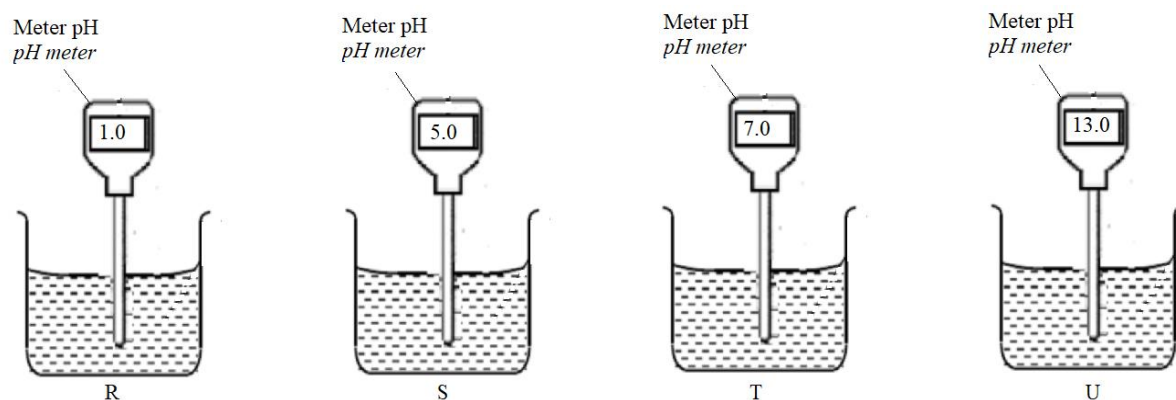
Atom manakah yang akan membentuk ion dengan cas -2?

Which atom will form an ion with a charge of -2?

A W
B X

C Y
D Z

14. Rajah 4 menunjukkan bacaan bagi meter pH untuk empat jenis larutan akueus, R, S, T dan U.
Diagram 4 shows the readings of pH meter for four types of aqueous solutions, R, S, T and U.



Rajah 4 / Diagram 4

Larutan akueus yang manakah mempunyai kepekatan ion hidrogen paling tinggi?

Which aqueous solution has the highest concentration of hydrogen ions?

A R
B S

C T
D U

15. Rajah 5 menunjukkan kaca fotokromik yang dapat melindungi mata kita daripada sinaran ultraungu (UV) yang berbahaya.
Diagram 5 shows photochromic glass that can protect our eyes from dangerous ultraviolet (UV) rays.



Rajah 5 / Diagram 5

Antara yang berikut, bahan kimia manakah yang digunakan dalam kaca fotokromik?
Which of the following chemical substance is used in the photochromic glass?

- A Boron oksida / *Boron oxide* C Plumbum(II) klorida / *Lead(II) chloride*
 B Plumbum(II) oksida / *Lead(II) oxide* D Argentum klorida / *Silver chloride*
16. Yang manakah menerangkan maksud perlanggaran berkesan?
Which of the following explains the meaning of effective collision?
- A Perlanggaran yang menyebabkan tindak balas berlaku
The collision that cause reactions to occur
 B Perlanggaran yang berlaku semasa tindak balas
The collision occur during reaction
 C Tenaga perlanggaran yang kurang dari tenaga pengaktifan
Collision energy that less than the activation energy
 D Perlanggaran yang mempunyai tenaga pengaktifan paling tinggi
The collision that has the highest activation energy
17. Rajah 6 menunjukkan struktur dan contoh bagi polimer P.
Diagram 6 shows the structure and examples of polymer P.



Rajah 6 / Diagram 6

Antara berikut, yang manakah sifat bagi polimer P?

Which of the following is a property of polymer P?

- A** Tidak dapat diacu berulang kali selepas dipanaskan dan tidak boleh dikitar semula
Cannot be repeatedly remoulded after heating and cannot be recycled.
- B** Dapat diregang dan kembali kepada bentuk asal selepas dilepaskan
Can be stretched and can return to their original shape when released
- C** Dapat diacu berulang kali selepas dipanaskan dan boleh dikitar semula
Can be repeatedly remoulded after heating and can be recycled
- D** Terurai atau hangus apabila dipanaskan dan tidak dapat dikitar semula
Disintegrate or burn upon heating and cannot be recycled

18. Antara yang berikut, yang manakah adalah bahan asas kosmetik?

Which of the following is the basic cosmetics ingredients?

- A** Air dan pemekat
Water and thickener
- B** Air dan antioksidan
Water antioxidant
- C** Air dan losyen
Water and lotion
- D** Antioksidan dan losyen
Antioxidant and lotion

19. Jadual 2 menunjukkan pemerhatian apabila oksida bagi unsur-unsur dalam Jadual Berkala Unsur ditambah ke dalam air.

Table 2 show the observation when oxide of elements in the Periodic Table of Elements are added into water.

Oksida unsur dalam Kala 3 <i>Oxides of element in Period 3</i>	Pemerhatian <i>Observation</i>
X_2O_3	Tiada perubahan <i>No changes</i>
YO	Tiada perubahan <i>No changes</i>
Z_2O	Larut membentuk larutan tidak berwarna <i>Dissolves to form a colourless solution</i>

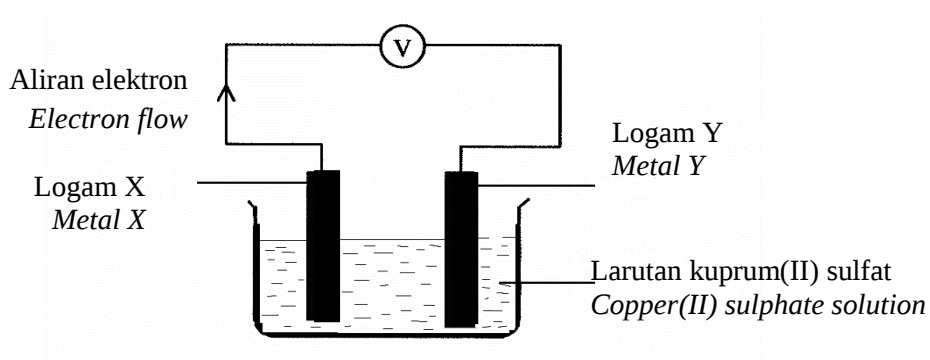
Jadual 2 / Table 2

Antara berikut manakah susunan yang betul mengikut pertambahan nombor proton bagi unsur-unsur tersebut?

Which of the following is the correct arrangement in increasing proton number of the elements?

- A** X, Y, Z
- B** Z, X, Y
- C** Z, Y, X
- D** Y, X, Z

- 20 Rajah 7 menunjukkan susunan radas sebuah sel kimia ringkas.
Diagram 7 shows the setup of the apparatus of a simple chemical cell.



Rajah 7 / Diagram 7

Persamaan sel setengah <i>Half-cell equation</i>	E °V (298 K)
$\text{Mg}^{2+} (\text{aq}) + 2\text{e}^{-} \rightleftharpoons \text{Mg} (\text{s})$	-2.38
$\text{Al}^{3+} (\text{aq}) + 3\text{e}^{-} \rightleftharpoons \text{Al} (\text{s})$	-1.66
$\text{Zn}^{2+} (\text{aq}) + 2\text{e}^{-} \rightleftharpoons \text{Zn} (\text{s})$	-0.76
$\text{Pb}^{2+} (\text{aq}) + 2\text{e}^{-} \rightleftharpoons \text{Pb} (\text{s})$	-0.13

Apakah logam X dan logam Y ?
What are metal X and Y?

	Logam X <i>Metal X</i>	Logam Y <i>Metal Y</i>
A	Aluminium <i>Aluminium</i>	Magnesium <i>Magnesium</i>
B	Plumbum <i>Lead</i>	Aluminium <i>Aluminium</i>
C	Aluminium <i>Aluminium</i>	Kuprum <i>Copper</i>
D	Plumbum <i>Lead</i>	Zink <i>Zinc</i>

21. Jadual 3 menunjukkan nombor proton bagi W, X, Y dan Z. W dan Y bertindak balas untuk menghasilkan sebatian A.
Table 3 shows the proton number for elements W, X, Y and Z. W and Y reacts to form compound A.

Unsur <i>Element</i>	Nombor proton <i>Proton number</i>
W	8
X	11
Y	15
Z	17

Jadual 3 / Table 3

Antara pernyataan berikut, yang manakah **benar** tentang sebatian A?
*Which of the following statement is **true** about the compound A?*

- I Sebatian A mudah meruap.
Compound A is volatile.
- II Sebatian A boleh mengkonduksikan elektrik dalam keadaan leburan.
Compound A can conduct electricity in molten state.
- III Sebatian A ialah cecair pada suhu bilik.
Compound A is a liquid at room condition.
- IV Sebatian A mempunyai takat lebur yang rendah.
Compound A has low melting point.

- A I dan II
I and II
- B II dan III
II and III

- C II dan IV
II and IV
- D I dan IV
I and IV

22. Jadual 4 menunjukkan jisim unsur Y dan O di dalam oksida Y dan jisim atom relatif masing-masing. *Table 4 shows the mass of elements Y and O in Y oxide and their relative atomic mass respectively.*

Unsur <i>Element</i>	Y	O
Jisim <i>Mass</i>	5.6	2.4
Jisim Atom relatif <i>Relative atomic mass</i>	56	16

Jadual 4 / Table 4

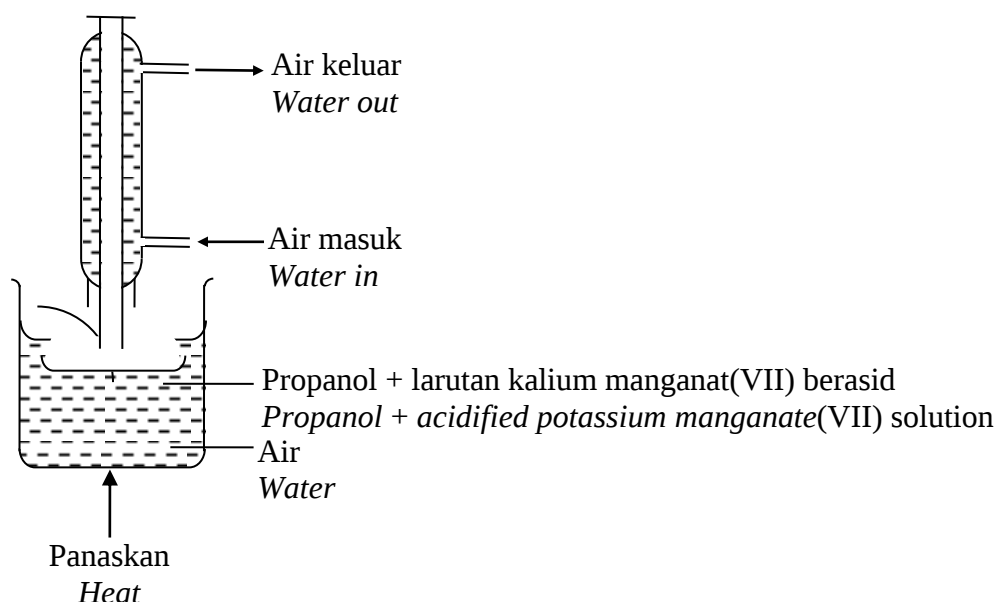
Apakah formula empirik oksida ini?
What is the empirical formula for this oxide?

- A Y_2O
- B YO_2

- C YO_3
- D Y_2O_3

23. Berapakah isomer bagi alkohol dengan formula C₄H₉OH?
How many isomers are there in the alcohol with the formula C₄H₉OH?
- A 3
B 4
C 5
D 6
24. Ciri manakah yang sama bagi semua unsur Kumpulan 17 dalam Jadual Berkala?
Which characteristic is similar for all elements in Group 17 of the Periodic Table?
- A Membentuk ion-ion berwarna
Form coloured ions
B Takat lebur dan takat didih yang tinggi
High melting and boiling points
C Wujud sebagai gas pada suhu bilik
Exist as gas at room temperature
D Larut dalam air untuk membentuk larutan berasid
Dissolve in water to form acidic solution
25. Pernyataan manakah yang betul mengenai tindak balas endotermik?
Which statement is correct about endothermic reaction?
- A Haba yang diserap semasa pemecahan ikatan adalah lebih daripada haba yang dibebaskan semasa pembentukan ikatan
The heat absorbed during bond breaking is more than the heat released during bond formation
B Haba yang diserap semasa pemecahan ikatan adalah kurang daripada haba yang dibebaskan semasa pembentukan ikatan
The heat absorbed during bond breaking is less than the heat released during bond formation
C Haba yang diserap semasa pemecahan ikatan adalah sama dengan haba yang dibebaskan semasa pembentukan ikatan
The heat absorbed during bond breaking is equal to the heat released during bond formation
D Tiada haba diserap atau dibebaskan semasa pemecahan ikatan dan pembentukan ikatan
No heat is absorbed or released during bond breaking and bond formation
26. Pepejal natrium klorida tidak dapat mengkonduksikan elektrik tetapi larutan sodium klorida dapat mengkonduksikan elektrik.
Antara yang berikut, yang manakah paling baik menerangkan pernyataan di atas?
Solid sodium chloride does not conduct electricity but sodium chloride solution can conduct electricity.
Which of the following best explain the statement above?
- A Natrium klorida larut di dalam air untuk membentuk larutan alkali
Sodium chloride dissolves in water to form an alkali solution
B Natrium klorida larut di dalam air untuk membentuk ion-ion bergerak bebas
Sodium chloride dissolves in water to form free moving ions
C Natrium klorida larut di dalam air dan bergerak bebas di dalam larutan
Sodium chloride dissolves in water and move freely in the solution
D Natrium klorida larut di dalam air untuk membentuk elektron yang bergerak bebas
Sodium chloride dissolves in water to form free moving electrons

27. Pernyataan manakah yang menerangkan mengapa aloi lebih keras daripada logam tulen?
Which statement explains why alloy is harder than pure metal?
- A Atom logam lain bertindak balas dengan atom logam tulen
Atom of other metal reacts with atom of pure metal
 - B Atom logam lain mengurangkan atom logam tulen daripada menggelongsor
Atom of other metal reduces atom of pure metal from sliding
 - C Ikatan antara atom dalam aloi lebih kuat
Bonds between atom in alloy is stronger
 - D Ketumpatan aloi lebih tinggi
Density of alloy is higher
28. Rajah 8 menunjukkan satu eksperimen refluks bagi propanol dengan larutan kalium manganat(VII) berasid. Sebatian X merupakan hasil tindak balas ini.
Diagram 8 shows an experiment in which propanol is refluxed with acidified potassium manganate(VII) solution. Compound X is the product of this reaction.

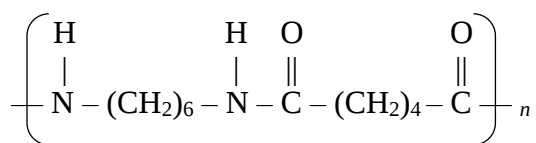


Rajah 8 / Diagram 8

Antara yang berikut, yang manakah sifat sebatian X?
Which of the following is a property of compound X?

- A Bertindak balas dengan kuprum(II) oksida untuk menghasilkan garam dan air.
Reacts with copper(II) oxide to produce salt and water.
- B Melunturkan warna ungu larutan kalium manganat(VII) berasid.
Decolourises purple colour of acidified potassium manganate(VII) solution.
- C Bertindak balas dengan serpihan porselin untuk membebaskan gas tidak berwarna.
Reacts with porcelain chips to release colourless gas.
- D Merupakan bahan yang berbau wangi.
It is a fragrant substance.

29. Rajah 9 menunjukkan formula struktur bagi nilon. *Diagram 9 shows the structural formula of nylon.*



Rajah 9 / Diagram 9

Antara berikut, pernyataan yang manakah **benar** mengenai nilon?
*Which of the following statement is **true** about nylon?*

- I Produk terbiodegradasi.
Biodegradable products.
- II Merupakan contoh polimer semula jadi.
Is an example of natural polymer.
- III Dihasilkan melalui pempolimeran kondensasi.
Produced through condensation polymerisation.
- IV Bahan tindak balas ialah 1,6-heksadiamina dan dekanadioil diklorida.
Reactants are 1,6-hexadamine and decanedioyl dichloride.

- A I dan II
I and II
- B I dan III
I and III

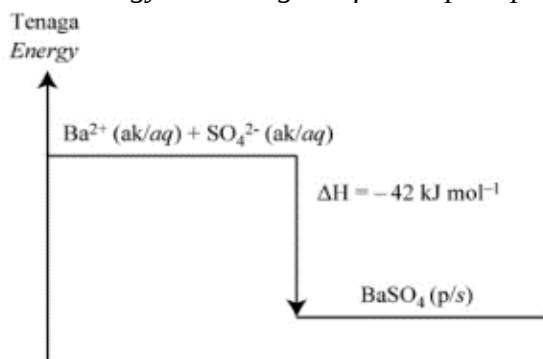
- C II dan IV
II and IV
- D III dan IV
III and IV

30. Apakah kepekatan larutan natrium hidroksida 0.5 mol dm⁻³ dalam unit g dm⁻³?
[Jisim atom relatif: Na = 23, O = 16, H = 1]
What is the concentration of 0.5 mol dm⁻³ sodium hydroxide solution in g dm⁻³ unit?
[Relative atomic mass: Na = 23, O = 16, H = 1]

- A 0.5
- B 2.0

- C 20.0
- D 40.0

31. Rajah 10 menunjukkan aras tenaga bagi tindak balas pemendakan barium sulfat.
Diagram 10 shows energy level diagram for the precipitation reaction of barium chloride.



Rajah 10 / Diagram 10

Berapakah haba yang dibebaskan apabila 48g barium sulfat terbentuk?

[Jisim atom relatif: Ba=137; S=32; O=16]

How much heat is released when 48g barium sulphate is formed?

[Relative atomic mass: Ba=137; S=32; O=16]

A 0.865 kJ

C 865.0 kJ

B 86.5 kJ

D 8.65 kJ

32. Jadual 5 menunjukkan isipadu gas oksigen yang dibebaskan bagi penguraian hidrogen peroksida.

Table 5 shows the volume of oxygen gas released for the decomposition of hydrogen peroxide.

Masa (s) <i>Time (s)</i>	0	30	60	90	120	150	180	210
Isipadu gas (cm ³) <i>Volume of oxygen (cm³)</i>	0.0	6.6	12.5	17.9	23.0	27.8	31.8	35.2

Jadual 5 / Table 5

Berapakah kadar tindak balas purata pada minit ketiga?

What is the average rate of reaction in the third minutes?

A 0.11 cm³ s⁻¹

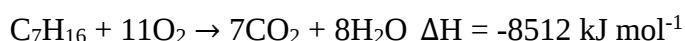
C 0.15 cm³ s⁻¹

B 0.13 cm³ s⁻¹

D 0.18 cm³ s⁻¹

33. Persamaan kimia berikut menunjukkan pembakaran bagi heptana dalam oksigen yang berlebihan.

The following thermochemical equation shows the combustion of heptane in excess oxygen.



Dalam suatu eksperimen, pembakaran bagi heptana dalam oksigen berlebihan membebaskan 2895 kJ tenaga. Apakah jisim bagi heptana yang digunakan?

[Jisim atom relatif: H = 1, C = 12]

In an experiment, the combustion of heptane in excess oxygen releases 2895 kJ of energy.

What is the mass of heptane used?

[Relative atomic mass: H = 1, C = 12]

A 17.0 g

C 68.0 g

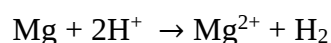
B 34.0 g

D 96.0 g

34. Apabila magnesium karbonat dipanaskan, gas yang dibebaskan menukarkan air kapur keruh. Apakah isipadu gas yang terbebas apabila 0.55 g magnesium karbonat dipanaskan pada STP?
 [Jisim atom relatif: C = 12, O = 16, Mg = 24; Isipadu molar gas pada STP = $22.4 \text{ dm}^3 \text{ mol}^{-1}$
When magnesium carbonate is heated, the gas released turns lime water chalky. What is the volume of gas released when 0.55 g of magnesium carbonate is heated at STP?
[Relative atomic mass: C = 12, O = 16, Mg = 24, Molar volume of gas at STP = $22.4 \text{ dm}^3 \text{ mol}^{-1}$]

- | | | | |
|----------|------------------------|----------|--------------------|
| A | 0.00655 dm^3 | C | 146 cm^3 |
| B | 0.0146 dm^3 | D | 655 cm^3 |

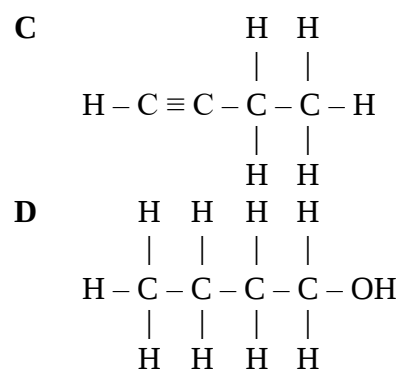
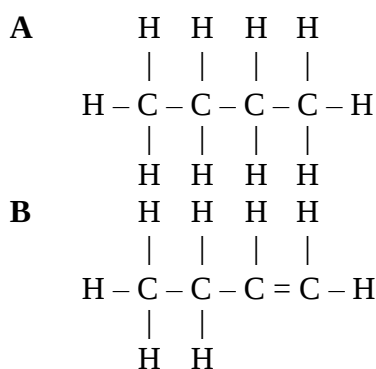
35. Persamaan ion berikut menunjukkan tindak balas antara magnesium dengan asid.
The following ionic equation shows the reaction between magnesium and acid.



Apakah perubahan nombor pengoksidaan bagi hidrogen?
What is the change in oxidation number of hydrogen?

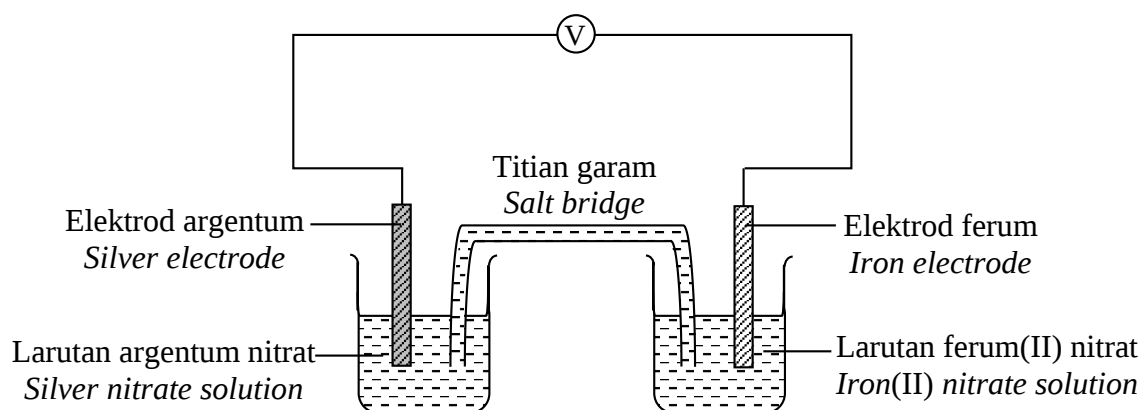
- | | | | |
|----------|-------------------------------|----------|---------------------------------|
| A | 0 kepada +1
<i>0 to +1</i> | C | +1 kepada 0
<i>+1 to 0</i> |
| B | 0 kepada +2
<i>0 to +2</i> | D | +1 kepada +2
<i>+1 to +2</i> |

36. Sebatian yang manakah menghasilkan paling banyak jelaga?
Which of the compound produces the most soot?



37. Rajah 11 menunjukkan susunan radas bagi satu sel kimia.

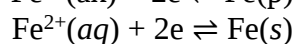
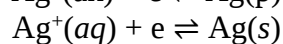
Diagram 11 shows the apparatus set-up for a voltaic cell.



Rajah 11 / Diagram 11

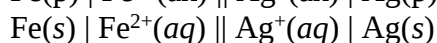
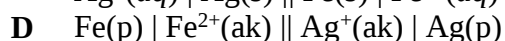
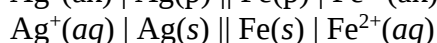
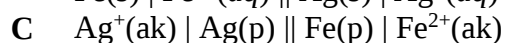
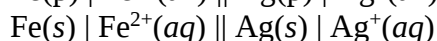
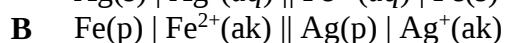
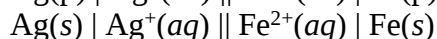
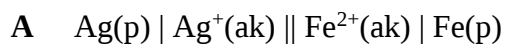
Diberi nilai keupayaan elektrod berikut:

Given the following electrode potential values:



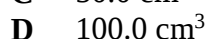
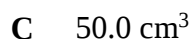
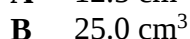
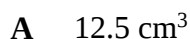
Apakah notasi sel untuk sel kimia tersebut?

What is the cell notation of the voltaic cell?

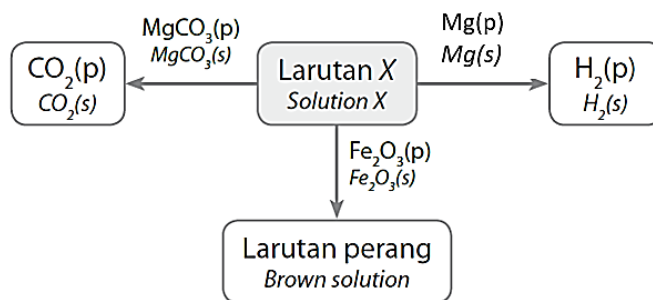


38. Suatu asid diprotik, H_2X mempunyai kepekatan 1.0 mol dm^{-3} . Berapakah isi padu H_2X yang diperlukan untuk meneutralkan 50.0 cm^3 larutan natrium hidroksida, NaOH 0.5 mol dm^{-3} ?

A diprotic acid, H_2X has a concentration of 1.0 mol dm^{-3} . What is the volume of H_2X needed to neutralise 50.0 cm^3 of 0.5 mol dm^{-3} sodium hydroxide solution, NaOH ?



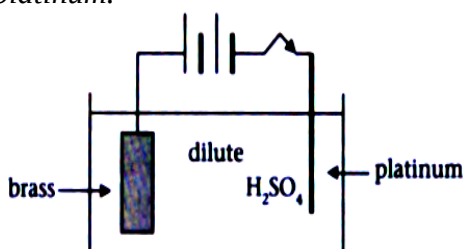
39. Rajah 12 menunjukkan tindak balas larutan X dengan MgCO_3 , Mg dan Fe_2O_3 .
Diagram 12 shows the reaction of solution X with MgCO_3 , Mg and Fe_2O_3 .



Rajah 12 / Diagram 12

Kenalpasti larutan X?
Identify solution X?

- A $\text{Ba}(\text{NO}_3)_2$ (ak)
 $\text{Ba}(\text{NO}_3)_2$ (aq)
- B BaCl_2 (ak)
 BaCl_2 (aq)
- C NaOH (ak)
 NaOH (aq)
- D HCl (ak)
 HCl (aq)
40. Rajah 13 menunjukkan litar yang telah disediakan dengan anod loyang (aloi kuprum dan zink) dan katod platinum.
Diagram 13 shows the circuit that was set up with an anode of brass (an alloy of copper and zinc) and a cathode of platinum.



Rajah 13 / Diagram 13

Antara pasangan tindak balas elektrod berikut, yang manakah dijangka berlaku apabila suis ditutup?

Which one of the following pairs of electrode reactions would be expected to occur when the switch is closed?

	Tindak balas di anod <i>Anode reaction</i>	Tindak balas di katod <i>Cathode reaction</i>
A	Kuprum terlarut <i>Copper dissolves</i>	Gas hydrogen terbebas <i>Hydrogen gas released</i>
B	Zink dan kuprum larut <i>Zinc and copper dissolve</i>	Kuprum termendap <i>Copper is deposited</i>
C	Zink terlarut <i>Zinc dissolves</i>	Gas hydrogen terbebas <i>Hydrogen gas released</i>
D	Zink dan kuprum larut <i>Zinc and copper dissolve</i>	Gas hydrogen terbebas <i>Hydrogen gas released</i>

KERTAS PEPERIKSAAN TAMAT

SKEMA JAWAPAN
PRAKTIS KIMIA 4541/1
SET 2

1	C	11	B	21	D	31	D
2	C	12	B	22	D	32	C
3	D	13	B	23	B	33	B
4	B	14	A	24	C	34	C
5	C	15	D	25	A	35	C
6	D	16	A	26	B	36	C
7	B	17	C	27	B	37	D
8	B	18	A	28	A	38	A
9	C	19	B	29	D	39	D
10	D	20	C	30	C	40	C

LAMPIRAN

(Untuk rujukan guru)

**JADUAL SPESIFIKASI UJIAN (JSU)
PRAKTIS KIMIA 4541/1: SET 2**

Chapter	Sub-chapter	Remembering			Understanding			Applying			Analyzing			Total
		E	M	H	E	M	H	E	M	H	E	M	H	
1. Introduction to chemistry [F4]	1.1 Development in chemistry field and its importance in daily life													
	1.2 Scientific investigation in chemistry													
	1.3 Usage, management and handling of apparatus and materials													
2. Matter and the Atomic Structure [F4]	2.1 Basic concepts of matter													
	2.2 The development of the atomic model	1, 13												2
	2.3 Atomic structure	9												1
	2.4 Isotopes and its uses													
3. The Mole Concept, Chemical Formula and Equation [F4]	3.1 Relative atomic mass and relative molecular mass	6												1
	3.2 Mole concept								34					1
	3.3 Chemical formula					22								1
	3.4 Chemical equation													
4. The Periodic Table of Elements [F4]	4.1 The development of The Periodic Table of Elements													
	4.2 The arrangement in The Periodic Table of Elements													
	4.3 Elements in Group 18													
	4.4 Elements in Group 1													
	4.5 Elements in Group 17					24								1
	4.6 Elements in Period 3				19									1
	4.7 Transition elements	3												1
5. Chemical Bond [F4]	5.1 Basics of compound formation													
	5.2 Ionic bond													
	5.3 Covalent bond					21								1
	5.4 Hydrogen bond													
	5.5 Dative bond	11												1
	5.6 Metallic bond													
	5.7 Properties of ionic and covalent compounds					26								1

Chapter	Sub-chapter	Knowledge			Understanding			Application			Analysis			Total
		E	M	H	E	M	H	E	M	H	E	M	H	
6. Acid, Base and Salt [F4]	6.1 The role of water in showing acidic and alkaline properties													
	6.2 pH value													
	6.3 Strength of acids and alkalis	14								38				2
	6.4 Chemical properties of acids and alkalis	2												1
	6.5 Concentration of aqueous solution					30								1
	6.6 Standard solution													
	6.7 Neutralisation													
	6.8 Salts, crystals and their uses in daily life													
	6.9 Preparation of salts													
	6.10 Effect of heat on salts													
	6.11 Qualitative analysis												39	1
7. Rate of Reaction [F4]	7.1 Determining rate of reaction									32				1
	7.2 Factors affecting rate of reaction													
	7.3 Application of factors that affect the rate of reaction in daily life													
	7.4 Collision theory				16									1
	8.Manufactured Substances in Industry [F4]	8				27								2
	8.1 Alloy and its importance				15									1
	8.2 Composition of glass and its uses													
	8.3 Composition of ceramics and its uses													
	8.4 Composite materials and its importance													
9. Redox equilibrium [F5]	9.1 Oxidation and reduction	10								35				2
	9.2 Standard electrode potential													
	9.3 Voltaic cell				20					37				2
	9.4 Electrolytic cell												40	1
	9.5 Extraction of metal from its ore													
	9.6 Rusting													
10. Carbon compound [F5]	10.1 Types of carbon compound													
	10.2 Homologous series	7												1
	10.3 Chemical properties and interconversion of compounds between homologous series					28				36				2
	10.4 Isomers and naming based on IUPAC nomenclature					23								1
11. Thermochemistry [F5]	11.1 Heat change in reactions					25								1
	11.2 Heat of reaction									31, 33				2
	11.3 Application of endothermic and exothermic reactions in daily life													
Chapter	Sub-chapter	Knowledge			Understanding			Application			Analysis			Total
		E	M	H	E	M	H	E	M	H	E	M	H	
12. Polymer Chemistry [F5]	12.1 Polymer	17				29								2
	12.2 Natural rubber	5												1
	12.3 Synthetic rubber													
13. Consumer and Industrial Chemistry [F5]	13.1 Oils and fats	4												1
	13.2 Cleaning agents													
	13.3 Food additives													
	13.4 Medicines and cosmetics	18												1
	13.5 Application of nanotechnology in industry	12												1
	13.6 Application of green technology in industrial waste management													
Total		16	0	0	4	10	0	0	1	7	0	0	2	40
Ratio of E:M:H														
Level of Difficulty		E : Easy M : Medium H : Hard												