



**INFORMATION FOR CANDIDATES**

1. *This question paper consists of 50 questions.*
2. *Answer **all** questions.*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken only **one** space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*

**MAKLUMAT UNTUK CALON**

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab **semua** soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Hitamkan **satu** ruangan sahaja bagi setiap soalan.*
5. *Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

1. Which substance is a compound?

*Bahan manakah yang merupakan sebatian?*

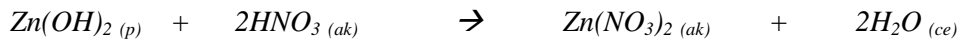
- A. Sodium  
*Natrium*
- B. Magnesium  
*Magnesium*
- C. Carbon  
*Karbon*
- D. Naphthalene  
*Naftalena*

2. The following equation represents a reaction.



What are the reactants in this equation?

*Persamaan berikut mewakili satu tindak balas.*



*Apakah bahan-bahan tindak balas dalam persamaan ini?*

- A. Zinc nitrate and water  
*Zink nitrat dan air*
- B. Zinc nitrate and nitric acid  
*Zink nitrat dan asid nitrik*
- C. Zinc hydroxide and nitric acid  
*Zink hidroksida dan asid nitrik*
- D. Zinc hydroxide and zinc nitrate  
*Zink hidroksida dan zink nitrat*

3. Which statement explains why the size of the atoms of Period 3 elements decrease across the period in the Periodic Table.

*Pernyataan manakah yang menerangkan mengapa saiz atom unsur-unsur Kala 3 berkurang apabila merentasi kala dalam Jadual Berkala?*

- A. The number of protons increases  
*Bilangan proton bertambah*
- B. The relative atomic mass increases  
*Jisim atom relatif bertambah*
- C. The number of valence electrons increases  
*Bilangan elektron valens bertambah*
- D. The number of shells filled with electrons increases  
*Bilangan petala yang berisi elektron bertambah*

4. What is the meaning of ionic bond?

*Apakah maksud ikatan ion?*

A. A bond formed when metal atoms contribute electrons to each other to achieve a stable electron arrangement.

*Ikatan yang terbentuk apabila atom-atom logam menyumbangkan elektron kepada satu sama lain untuk mencapai suatu susunan elektron yang stabil.*

B. A bond formed when non-metal atoms share electron to achieve a stable electron arrangement.

*Ikatan yang terbentuk apabila atom-atom bukan logam berkongsi elektron untuk mencapai suatu susunan elektron yang stabil.*

C. A bond formed by weak Van der Waals forces between the non-metal atoms

*Ikatan yang terbentuk oleh daya Van der Waals yang lemah di antara atom-atom bukan logam.*

D. A bond formed when a metal atom transfers an electron to a non-metal atom.

*Ikatan yang terbentuk apabila atom logam memindahkan elektron kepada atom bukan logam.*

5. Which substances are non-electrolytes?

*Bahan-bahan manakah adalah bukan elektrolit?*

I Ethanol

*Etanol*

II Acetamide

*Asetamida*

III Lead(II) bromide

*Plumbum(II) bromida*

IV Sodium chloride

*Natrium klorida*

A. I and II only

*I dan II sahaja*

B. I and III only

*I dan III sahaja*

C. II and IV only

*II dan IV sahaja*

D. III and IV only

*III dan IV sahaja*

6. Table 1 shows the pH values of four acidic solutions which have the same concentration.  
*Jadual 1 menunjukkan nilai pH bagi empat larutan asid yang mempunyai kepekatan yang sama.*

<b>Solution</b> <i>Larutan</i>	<b>pH value</b> <i>Nilai pH</i>
P	1.0
Q	3.0
R	5.0
S	6.0

Table 1  
*Jadual 1*

Which acidic solution has the highest degree of dissociation?

*Larutan asid manakah yang mempunyai darjah penceraian yang paling tinggi?*

- A. P
- B. Q
- C. R
- D. S

7. Which alloy contains a mixture of copper and zinc?

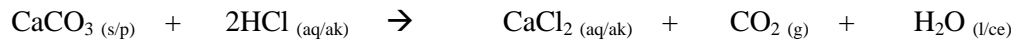
*Aloi manakah yang mengandungi campuran kuprum dan zink?*

- A. Brass  
*Loyang*
- B. Steel  
*Keluli*
- C. Bronze  
*Gangsa*
- D. Duralumin  
*Duralumin*

YAYASAN  
PAHANG

8. The following equation represents the reaction between calcium carbonate and hydrochloric acid.

*Persamaan berikut mewakili tindak balas antara kalsium karbonat dan asid hidroklorik.*



Which method is the most suitable to increase the rate of reaction?

*Kaedah manakah yang paling sesuai untuk meningkatkan kadar tindak balas?*

- A. Decrease the size of calcium carbonate  
*Mengecilkan saiz kalsium karbonat*
- B. Decrease the volume of hydrochloric acid  
*Mengurangkan isipadu asid hidroklorik*
- C. Decrease the temperature of hydrochloric acid  
*Menurunkan suhu asid hidroklorik*
- D. Decrease the concentration of hydrochloric acid  
*Mengurangkan kepekatan asid hidroklorik*
9. Which of the following is an example of exothermic reaction?  
*Antara berikut yang manakah contoh bagi tindak balas eksotermik?*
- A. Photosynthesis in green plant  
*Fotosintesis dalam tumbuhan hijau*
- B. Solid ammonium nitrate dissolved in distilled water  
*Pepejal ammonium nitrat dilarutkan dalam air suling*
- C. Decomposition of copper(II) carbonate when heated  
*Penguraian kuprum(II) karbonat apabila dipanaskan*
- D. Solid sodium hydroxide dissolved in distilled water  
*Pepejal natrium hidroksida dilarutkan dalam air suling*
10. Which substance is used as a food flavouring?  
*Bahan manakah yang digunakan sebagai perisa makanan?*

- A. Sodium nitrite  
*Natrium nitrit*
- B. Azo compound  
*Sebatian Azo*
- C. Ascorbic acid  
*Asid askorbik*
- D. Monosodium glutamat  
*Mononatrium glutamat*

11. Which of the following are the similarities of isotopes of elements?

*Antara yang berikut, yang manakah adalah persamaan bagi isotop suatu unsur?*

- I Number of protons  
*Bilangan proton*
- II Number of neutrons  
*Bilangan neutron*
- III Physical properties  
*Sifat-sifat fizikal*
- IV Chemical properties  
*Sifat-sifat kimia*

- A. I and III only  
*I dan III sahaja*
- B. I and IV only  
*I dan IV sahaja*
- C. II and III only  
*II dan III sahaja*
- D. II and IV only  
*II dan IV sahaja*

12. The molecular formula of glucose is  $C_6H_{12}O_6$

What is the empirical formula of glucose?

*Formula molekul bagi glukosa ialah  $C_6H_{12}O_6$*

*Apakah formula empirik bagi glukosa?*

- A. CHO  
*CHO*
- B.  $CH_2O$   
 *$CH_2O$*
- C.  $C_2H_2O_2$   
 *$C_2H_2O_2$*
- D.  $C_2H_4O_2$   
 *$C_2H_4O_2$*

13. Which particles are produced when an electrolyte dissolve in water?

*Zarah manakah yang terhasil apabila elektrolit melarut dalam air?*

- A. Ions  
*Ion*
- B. Atoms  
*Atom*
- C. Electrons  
*Elektron*
- D. Molecules  
*Molekul*

14. Table 2 shows the electron arrangements of atoms W, X, Y and Z.  
*Jadual 2 menunjukkan susunan elektron bagi atom W, X, Y dan Z.*

<b>Atom</b> <i>Atom</i>	<b>Electron arrangement</b> <i>Susunan elektron</i>
W	2.4
X	2.8.1
Y	2.8.2
Z	2.8.7

Table 2  
*Jadual 2*

Which pair of atoms forms a compound by sharing electron?  
*Pasangan atom manakah yang membentuk sebatian melalui perkongsian elektron?*

- A. W and Z  
*W dan Z*
- B. W and Y  
*W dan Y*
- C. X and Z  
*X dan Z*
- D. X and Y  
*X dan Y*
15. Which statement is correct about alkali?  
*Pernyataan manakah yang betul tentang alkali?*
- A. Alkali solution conducts electric current  
*Larutan alkali mengkonduksikan arus elektrik*
- B. Strong alkali ionizes partially in water  
*Alkali kuat mengion separa di dalam air*
- C. Weak alkali produces high concentration of hydroxide ion  
*Alkali lemah menghasilkan kepekatan ion hidroksida yang tinggi*
- D. The presence of water enables alkali to produce hydrogen ion  
*Kehadiran air membolehkan alkali menghasilkan ion hidrogen*



16. What types of glass is formed when sodium carbonate is heated with silicon dioxide?  
*Apakah jenis kaca yang terbentuk apabila natrium karbonat yang dipanaskan dengan silikon dioksida?*
- A. Fused glass  
*Kaca silika terlakur*
- B. Borosilicate glass  
*Kaca borosilikat*
- C. Lead crystal glass  
*Kaca plumbum*
- D. Soda lime glass  
*Kaca soda kapur*
17. Which reaction has the highest rate of reaction?  
*Tindak balas manakah yang mempunyai kadar tindak balas yang paling tinggi?*
- A. Rusting of iron fence  
*Pengaratan pagar besi*
- B. Decaying of death organism  
*Pereputan organisma yang telah mati*
- C. Burning of small piece of charcoal in the air  
*Pembakaran ketulan kecil arang batu dalam udara*
- D. Formation of stalactites and stalagmites in a cave  
*Pembentukan stalaktit dan stalagmit dalam gua*
18. Which of the following is correct about exothermic and endothermic reactions?  
*Antara yang berikut, yang manakah betul mengenai tindak balas eksotermik dan tindak balas endotermik?*

	<b>Exothermic reaction</b> <i>Tindak balas eksotermik</i>	<b>Endothermic reaction</b> <i>Tindak balas endotermik</i>
A.	Heat is absorbed <i>Haba diserap</i>	Heat is released <i>Haba dibebaskan</i>
B.	Chemical bond is broken <i>Ikatan kimia dipecahkan</i>	Chemical bond is formed <i>Ikatan kimia terbentuk</i>
C.	Temperature of surroundings increases <i>Suhu persekitaran meningkat</i>	Temperature of surroundings decreases <i>Suhu persekitaran menurun</i>
D.	Total energy content of product is higher than total energy content of reactant <i>Jumlah kandungan tenaga hasil tindak balas lebih tinggi daripada jumlah tenaga bahan tindak balas</i>	Total energy content of reactant is higher than total energy content of product <i>Jumlah kandungan tenaga bahan tindak balas lebih tinggi daripada jumlah tenaga hasil tindak balas</i>

19. Which of the following shows sublimation process  
*Antara yang berikut, yang manakah menunjukkan proses pemejalwapan?*
- A. Bromine vapour spreads throughout gas jar  
*Wap bromin tersebar ke seluruh balang gas*
  - B. Ice changes into liquid at room temperature  
*Ais bertukar menjadi cecair pada suhu bilik*
  - C. Naphthalene ball in cupboard become smaller  
*Bebola naftalena dalam almari menjadi kecil*
  - D. Volume of perfume decreases in an opened bottle  
*Isipadu minyak wangi berkurang apabila botol terbuka.*
20. Which substance neutralizes a solution with the pH value of 10?  
*Bahan manakah meneutralkan suatu larutan dengan nilai pH 10?*
- A. Distilled water  
*Air suling*
  - B. Hydrochloric acid  
*Asid hidroklorik*
  - C. Potassium chloride  
*Kalium klorida*
  - D. Potassium hydroxide  
*Kalium hidroksida*
21. Which of the following is not a chemical properties of acids?  
*Antara yang berikut, yang manakah bukan sifat kimia bagi asid?*
- A. React with alkali to produce salt and hydrogen  
*Bertindak balas dengan alkali menghasilkan garam dan hidrogen.*
  - B. React with metal oxide to produce salts and water.  
*Bertindak balas dengan oksida logam menghasilkan garam dan air*
  - C. React with reactive metal to produce salt and hydrogen.  
*Bertindak balas dengan logam reaktif untuk menghasilkan garam dan hidrogen.*
  - D. React with metal carbonate to produce salts, water and carbon dioxide  
*Bertindak balas dengan karbonat logam menghasilkan garam, air dan karbon dioksida.*

22. Diagram 1 shows a standard representative of element Z.  
Z is not the actual symbol of the element.  
*Rajah 1 menunjukkan perwakilan piawai bagi unsur Z.  
Z bukan simbol sebenar bagi unsur itu.*

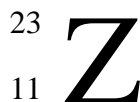


Diagram 1  
*Rajah 1*

Which of the following shows the electron arrangement and the number of neutrons in an atom of Z?

*Antara yang berikut, yang manakah menunjukkan susunan elektron dan bilangan neutron dalam suatu atom Z?*

	<b>Electron arrangement</b> <i>Susunan elektron</i>	<b>Number of neutron</b> <i>Bilangan neutron</i>
A.	2.8.1	11
B.	2.8.2	11
C.	2.8.1	12
D.	2.8.2	12

23. Compound M conduct electricity in aqueous solution or molten state. It also has a high melting point and boiling point.  
What is compound M?  
*Sebatian M mengkonduksikan elektrik dalam larutan akueus atau keadaan lebur. Ia juga mempunyai takat lebur dan takat didih yang tinggi.  
Apakah sebatian M?*

- A. CO<sub>2</sub>  
B. NH<sub>3</sub>  
C. CCl<sub>4</sub>  
D. MgCl<sub>2</sub>

24. Table 3 shows the proton numbers of element J and element K.

J and K are not the actual symbols of the elements.

*Jadual 3 menunjukkan nombor proton bagi unsur J dan unsur K.*

*J dan K bukan simbol sebenar bagi unsur-unsur itu.*

Element <i>Unsur</i>	Proton number <i>Nombor proton</i>
J	9
K	17

Table 3

*Jadual 3*

Which statements are true about element J and element K?

*Pernyataan manakah yang manakah benar tentang unsur J dan unsur K?*

- I Atoms J and K have seven electron valence  
*Atom J dan K mempunyai tujuh elektron valens*
- II Element J is less reactive than element K  
*Unsur J adalah kurang reaktif daripada unsur K*
- III Atom J has a bigger atomic size than atom K  
*Atom J mempunyai saiz atom yang lebih besar daripada atom K*
- IV Element J and K are in the same group in the Periodic Table.  
*Unsur J dan unsur K berada dalam kumpulan yang sama dalam Jadual Berkala.*
- A. I and III only  
*I dan III sahaja*
- B. I and IV only  
*I dan IV sahaja*
- C. II and III only  
*II dan III sahaja*
- D. II and IV only  
*II dan IV sahaja*

25. A concentrated potassium bromide solution is electrolysed using carbon electrodes.

Which are the half equation that represent the reactions at the anode and the cathode?

*Larutan kalium bromida pekat dielektrolisiskan menggunakan elektrod karbon.*

*Setengah persamaan manakah yang mewakili tindak balas di anod dan di katod.*

	Anode <i>Anod</i>	Cathode <i>Katod</i>
A.	$2\text{Br}^- \rightarrow \text{Br}_2 + 2\text{e}$	$\text{K}^+ + \text{e} \rightarrow \text{K}$
B.	$2\text{Br}^- \rightarrow \text{Br}_2 + 2\text{e}$	$2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$
C.	$4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$	$\text{K}^+ + \text{e} \rightarrow \text{K}$
D.	$4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}$	$2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$

26. Carbonate ion,  $\text{CO}_3^{2-}$  react with an element R in Group 2 to form a compound.

R is not the actual symbol of the element.

What is the formula of the compound?

*Ion karbonat,  $\text{CO}_3^{2-}$  bertindak balas dengan suatu unsur R dalam Kumpulan 2 untuk membentuk suatu sebatian.*

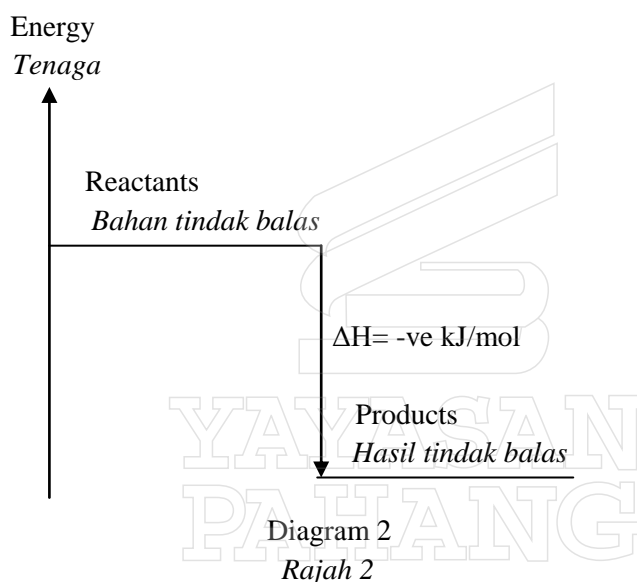
*R bukan simbol sebenar unsur itu.*

*Apakah formula bagi sebatian itu?*

- A.  $\text{RCO}_3$
- B.  $\text{R}_2\text{CO}_3$
- C.  $\text{R}(\text{CO}_3)_2$
- D.  $\text{R}_2(\text{CO}_3)_3$

27. Diagram 2 shows an energy level diagram.

*Rajah 2 menunjukkan gambar rajah aras tenaga.*



Which of the following can be deduced from Diagram 2

*Antara berikut, yang manakah boleh disimpulkan daripada Rajah 2?*

- A. Heat is released  
*Haba dibebaskan*
- B. The products are less stable than the reactants  
*Hasil tindak balas adalah kurang stabil daripada bahan tindak balas*
- C. The surrounding temperature decreases during the reaction  
*Suhu persekitaran menurun semasa tindak balas*
- D. The total energy of the reactants is less than the total energy of the products.  
*Jumlah tenaga bahan tindak balas adalah kurang daripada jumlah tenaga hasil tindak balas.*

28. Table 4 shows the observations in three tests on solution Y.

*Jadual 4 menunjukkan pemerhatian bagi tiga ujian ke atas larutan garam Y.*

<b>Set Set</b>	<b>Test Ujian</b>	<b>Observation Pemerhatian</b>
I	Add sodium hydroxide solution until in excess . <i>Tambah larutan natrium hidroksida sehingga berlebihan</i>	White precipitate which dissolves in excess sodium hydroxide solution <i>Mendakan putih larut dalam larutan natrium hidroksida berlebihan</i>
II	Add ammonia solution until in excess <i>Tambah larutan ammonia sehingga berlebihan</i>	White precipitate which dissolves in excess ammonia solution <i>Mendakan putih larut dalam larutan ammonia berlebihan</i>
III	Add dilute nitric acid and silver nitrate solution. <i>Tambah asid nitrik cair dan larutan argentum nitrat</i>	White precipitate formed <i>Mendakan putih terbentuk</i>

Table 4

*Jadual 4*

What is Y?

*Apakah Y?*

- A. Zinc chloride  
*Zink klorida*
- B. Zinc sulphate  
*Zink sulfat*
- C. Aluminium chloride  
*Aluminium klorida*
- D. Aluminium sulphate  
*Aluminium sulfat*

29. Which of the following particles contain 10 electrons?

[Proton number: Ne = 10, Na = 11, Mg = 12]

*Antara zarah berikut, yang manakah mengandungi 10 elektron?*

[Nombor proton: Ne = 10, Na = 11, Mg = 12]

I Na

II Ne

III Na<sup>+</sup>

IV Mg<sup>2+</sup>

A. I, II and III only

*I, II dan III sahaja*

B. I, II and IV only

*I, II dan IV sahaja*

C. I, III and IV only

*I, III dan IV sahaja*

D. II, III and IV only

*II, III dan IV sahaja*

30. Diagram 3 shows energy profile of a reaction.

*Rajah 3 menunjukkan profil tenaga untuk satu tindak balas*

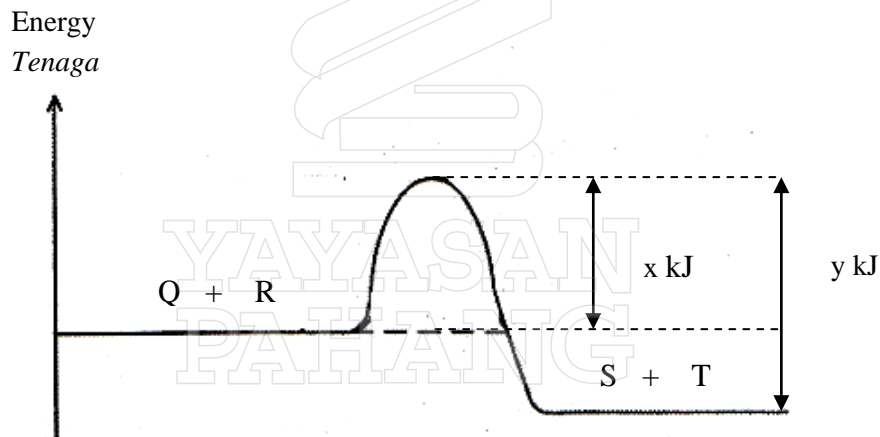


Diagram 3

*Rajah 3*

Which of the following is true about the diagram?

*Antara berikut, yang manakah benar tentang gambarajah itu?*

A. The reaction is endothermic

*Tindak balas adalah endotermik*

B. The activation energy is y kJ

*Tenaga pengaktifan ialah y kJ*

C. The heat of reaction is  $-(y-x)$  kJ

*Haba tindak balas ialah  $-(y-x)$  kJ*

D. y value increases with the presence of a catalyst

*Nilai y bertambah dengan kehadiran mangkin*

31. Which statement shows the difference between propene and propane?  
*Pernyataan manakah yang menunjukkan perbezaan antara propena dan propana?*

- A. Propene dissolved in water but propane does not  
*Propena larut dalam air tetapi propana tidak larut dalam air*
- B. The carbon percentage per molecule of propene is higher  
*Peratus karbon per molekul bagi propena lebih tinggi.*
- C. The number of hydrogen atoms per molecule of propene is higher  
*Bilangan atom hidrogen per molekul propena lebih tinggi*
- D. Propane decolourised the brown colour of bromine water but butene does not.  
*Propana menyahwarnakan warna perang air bromin tetapi butena tidak*

32. Which equation represents a redox reaction?  
*Persamaan manakah yang mewakili suatu tindak balas redoks?*

- A.  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- B.  $\text{Cu}(\text{NO}_3)_2 + \text{Zn} \rightarrow \text{Zn}(\text{NO}_3)_2 + \text{Cu}$
- C.  $2\text{KCl} + \text{Pb}(\text{NO}_3)_2 \rightarrow \text{PbCl}_2 + 2\text{KNO}_3$
- D.  $\text{MgCO}_3 + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2\text{O} + \text{CO}_2$

33. Element K is located in the same group as sodium in the Periodic Table.  
 K is not actual symbol of the element.  
 Which of the following statements are chemical properties of element K?  
*Unsur K berada dalam kumpulan yang sama dengan natrium dalam Jadual Berkala.  
 K bukan simbol sebenar unsur itu.*

*Antara pernyataan berikut, yang manakah sifat kimia bagi unsur K?*

- I React with water to produce an alkaline solution  
*Bertindak balas dengan air untuk menghasilkan larutan bersifat alkali.*
- II React with oxygen to produced black solid  
*Bertindak balas dengan oksigen untuk menghasilkan pepejal hitam*
- III React with chlorine gas to produce a white solid  
*Bertindak balas dengan gas klorin menghasilkan pepejal putih*
- IV React with sodium hydroxide solution to produce an acidic solution  
*Bertindak balas dengan larutan natrium hidroksida untuk menghasilkan larutan bersifat asid.*

- A. I and III only  
*I dan III sahaja*
- B. I and IV only  
*I dan IV sahaja*
- C. II and III only  
*II dan III sahaja*
- D. II and IV only  
*II dan IV sahaja*



34. Diagram 4 shows the set-up of apparatus to determine the heat of precipitation of silver chloride.

Rajah 4 menunjukkan susunan radas bagi menentukan haba pemendakan argentum klorida.

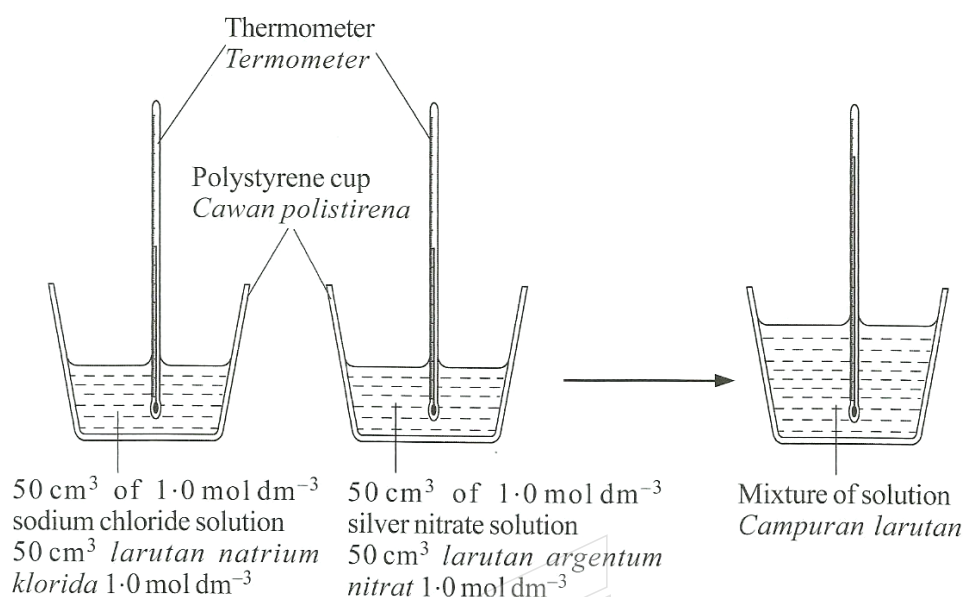


Diagram 4  
Rajah 4

The temperature of the mixture rises by 5 °C.

Which solution can be used to replace sodium chloride solution to get the same rise in temperature?

Suhu campuran meningkat sebanyak 5 °C.

Larutan manakah boleh digunakan bagi menggantikan larutan natrium klorida bagi mendapatkan kenaikan suhu yang sama?

- A. 50 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> of potassium chloride solution  
50 cm<sup>3</sup> larutan kalium klorida 1.0 mol dm<sup>-3</sup>
- B. 50 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> magnesium chloride solution  
50 cm<sup>3</sup> larutan magnesium klorida 1.0 mol dm<sup>-3</sup>
- C. 50 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> barium chloride solution  
50 cm<sup>3</sup> larutan barium klorida 1.0 mol dm<sup>-3</sup>
- D. 50 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> aluminium chloride solution  
50 cm<sup>3</sup> larutan aluminium klorida 1.0 mol dm<sup>-3</sup>

35. Why sodium chloride used in the preparation of soap?  
*Mengapakah natrium klorida digunakan dalam penyediaan sabun?*

- A. To speed up the reaction to produce soap  
*Mempercepatkan tindak balas untuk menghasilkan sabun*
- B. To produce soap which foams easily.  
*Menghasilkan sabun yang berbuih dengan mudah*
- C. To reduce solubility of soap  
*Mengurangkan keterlarutan sabun*
- D. To make soap softer  
*Menjadikan sabun lebih lembut*

36. What is the mass of carbon in 88 g of carbon dioxide?  
 [Relative atomic mass: C = 12; O = 16]  
*Berapakah jisim karbon dalam 88 g karbon dioksida?*  
 [Jisim atom relatif: C = 12; O = 16]

- A. 12 g
- B. 16 g
- C. 24 g
- D. 64 g

37. The following equation represents the reaction between potassium and oxygen.  
*Persamaan berikut mewakili tindak balas antara kalium dan oksigen.*



What is the maksimum mass of potassium oxide formed when 19.5 g of potassium is heated completely in oxygen.

[Relative atomic mass: K = 39; O = 16]

*Berapakah jisim maksimum kalium oksida yang terbentuk apabila 19.5 g kalium dipanaskan dengan lengkap dalam oksigen.*

[Jisim atom relatif: K = 39; O = 16]

- A. 15.5 g
- B. 19.5 g
- C. 23.5 g
- D. 31.5 g

38. Which solution contains the greatest number of hydrogen ion?

*Larutan manakah mengandungi paling banyak ion hidrogen?*

- A.  $0.3 \text{ dm}^3$   $2.0 \text{ mol dm}^{-3}$  sulphuric acid  
 *$0.3 \text{ dm}^3$  asid sulfurik  $2.0 \text{ mol dm}^{-3}$*
- B.  $0.4 \text{ dm}^3$   $2.0 \text{ mol dm}^{-3}$  nitric acid  
 *$0.4 \text{ dm}^3$  asid nitrik  $2.0 \text{ mol dm}^{-3}$*
- C.  $0.5 \text{ dm}^3$   $2.0 \text{ mol dm}^{-3}$  hydrochloric acid  
 *$0.5 \text{ dm}^3$  asid hidroklorik  $2.0 \text{ mol dm}^{-3}$*
- D.  $0.6 \text{ dm}^3$   $2.0 \text{ mol dm}^{-3}$  ethanoic acid  
 *$0.6 \text{ dm}^3$  asid etanoik  $2.0 \text{ mol dm}^{-3}$*

39. Table 5 shows the total volume of hydrogen gas, collected at regular intervals for the reaction between magnesium and dilute nitric acid.

*Jadual 5 menunjukkan jumlah isi padu gas hidrogen, yang dikumpul pada sela masa yang sekata bagi tindak balas antara magnesium dan asid nitrik.*

<b>Time (min)</b> <i>Masa(min)</i>	<b>Total volume of hydrogen gas (cm<sup>3</sup>)</b> <i>Jumlah isipadu gas hidrogen (cm<sup>3</sup>)</i>
0.0	0.00
0.5	8.00
1.0	14.50
1.5	20.50
2.0	24.00
2.5	26.50
3.0	26.50
3.5	26.50

Table 5  
*Jadual 5*

What is the average rate of reaction?

*Berapakah kadar tindak balas purata?*

- A.  $0.10 \text{ cm}^3 \text{ min}^{-1}$
- B.  $7.70 \text{ cm}^3 \text{ min}^{-1}$
- C.  $10.60 \text{ cm}^3 \text{ min}^{-1}$
- D.  $37.40 \text{ cm}^3 \text{ min}^{-1}$

40.  $100 \text{ cm}^3$  of water is heated by the burning of sample of ethanol. The heat released by the combustion is 10.5 kJ.

What is the maximum increase in temperature of the water.

[Specific heat capacity of water =  $4.2 \text{ J g}^{-1} \text{ } ^\circ\text{C}^{-1}$ ]

*100 cm<sup>3</sup> air dipanaskan dengan pembakaran suatu sampel etanol. Haba yang dibebaskan daripada pembakaran itu ialah 10.5 kJ.*

*[Muatan haba tentu air =  $4.2 \text{ J g}^{-1} \text{ } ^\circ\text{C}^{-1}$ ]*

- A.  $0.025 \text{ } ^\circ\text{C}$   
 B.  $0.25 \text{ } ^\circ\text{C}$   
 C.  $2.5 \text{ } ^\circ\text{C}$   
 D.  $25 \text{ } ^\circ\text{C}$
41. What is the oxidation number of sulphur, S in  $\text{S}_2\text{O}_3^{2-}$  ion.  
*Apakah nombor pengoksidaan bagi sulfur, S dalam ion  $\text{S}_2\text{O}_3^{2-}$ ?*

- A. +2  
 B. +4  
 C. -2  
 D. -4

42. The following equation represents the combustion of propane in excess oxygen.  
*Persamaan berikut mewakili pembakaran propana dalam oksigen berlebihan.*



What is the volume carbon dioxide gas produced when  $48 \text{ cm}^3$  of propane is completely burnt?

[Molar volume of gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  at room temperature]

*Apakah isipadu gas karbon dioksida yang terhasil apabila  $48 \text{ cm}^3$  propana terbakar dengan lengkap?*

*[Isipadu molar gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  pada suhu bilik]*

- A.  $28 \text{ cm}^3$   
 B.  $48 \text{ cm}^3$   
 C.  $96 \text{ cm}^3$   
 D.  $144 \text{ cm}^3$

43. Hilmi has iron spoon.  
He wants to make the spoon more beautiful and durable to give his friends as present.  
What is the best way to do it?  
*Hilmi mempunyai sebatang sudu besi.*  
*Dia ingin menjadikan sudu itu lebih cantik dan tahan lama untuk dihadiahkan kepada rakannya.*  
*Apakah langkah yang paling baik dilakukan?*
- A. Dip the spoon in acid  
*Mencelup sudu dalam asid*
- B. Wash the spoon with detergent  
*Mencuci sudu dengan detergen*
- C. Plate the spoon with copper  
*Menyadur sudu dengan kuprum*
- D. Brush the spoon with glossy material.  
*Memberus sudu dengan bahan pengilap.*
44. When copper(II) carbonate,  $\text{CuCO}_3$  is heated the gas released turns the lime water chalky.  
What is the volume of gas released when 0.62 g of copper(II) carbonate is heated at room conditions?  
[Relative atomic mass: C = 12; O = 16; Cu = 64; Molar volume of gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  at room condition]  
*Apabila kuprum(II) karbonat,  $\text{CuCO}_3$  dipanaskan, gas yang terbebas menukarkan air kapur menjadi keruh.*  
*Berapakah isi padu gas yang terbebas apabila 0.62 g kuprum(II) karbonat dipanaskan pada keadaan bilik?*  
[Jisim atom relatif: C = 12; O = 16; Cu = 64; Isipadu molar gas =  $24 \text{ dm}^3 \text{ mol}^{-1}$  pada suhu bilik]
- A.  $5 \text{ cm}^3$
- B.  $120 \text{ cm}^3$
- C.  $240 \text{ cm}^3$
- D.  $360 \text{ cm}^3$

45. Table 6 shows the number of protons and electrons for atom of elements J, L, P and Q. The letters J, L, P and Q are not the actual symbols of the elements.

*Jadual 6 menunjukkan bilangan proton dan elektron bagi atom unsur-unsur J, L, P dan Q. Huruf-huruf J, L, P dan Q bukan simbol sebenar bagi unsur-unsur itu.*

Atom <i>Atom</i>	Number of proton <i>Bilangan proton</i>	Number of electron <i>Bilangan elektron</i>
J	8	8
L	11	11
P	12	12
Q	17	17

Table 6  
*Jadual 6*

Which is the correct formula and type of bond when two of the element react?

*Formula dan jenis ikatan manakah yang betul apabila dua daripada unsur-unsur itu bertindak balas?*

	Formula <i>Formula</i>	Type of bond <i>Jenis ikatan</i>
A.	L <sub>2</sub> J	Ionic <i>Ionik</i>
B.	LJ <sub>2</sub>	Covalent <i>Kovalen</i>
C.	P <sub>2</sub> Q	Ionic <i>Ionik</i>
D.	PQ <sub>2</sub>	Covalent <i>Kovalen</i>

46. An atom of the element E has 16 neutrons. The nucleon number of element E is 31.

Atom E receive electrons to form ion E. How many electrons in ion E?

*Suatu atom bagi unsur E mempunyai 16 neutron. Nombor nukleon bagi unsur E ialah 31.*

*Atom E menerima elektron untuk membentuk ion E.*

*Berapakah bilangan elektron dalam ion E?*

- A. 10  
B. 15  
C. 16  
D. 18

47. A rubber tapper faces a problem of coagulate latex. To solve the problem he has to add a substance into the latex.

Choose the correct substance and explanation to solve the problem.

*Seorang penoreh getah menghadapi masalah lateks menggumpal. Untuk menyelesaikan masalah itu, beliau perlu menambahkan suatu bahan ke dalam lateks itu.*

*Pilih bahan dan penerangan yang betul untuk menyelesaikan masalah itu.*

	<b>Substance Bahan</b>	<b>Explanation Penerangan</b>
A.	Ammonia solution <i>Larutan ammonia</i>	Contains $\text{OH}^-$ ion that neutralizes the $\text{H}^+$ ion from the lactic acid. <i>Mengandungi ion <math>\text{OH}^-</math> yang meneutralkan ion <math>\text{H}^+</math> daripada asid laktik</i>
B.	Ethanoic acid <i>Asid etanoik</i>	Contains $\text{H}^+$ ion that neutralize the negative charge on the membrane of rubber particles <i>Mengandungi ion <math>\text{H}^+</math> yang meneutralkan cas negatif pada membran zarah getah.</i>
C.	Sodium chloride solution <i>Larutan natrium klorida</i>	As a preservative to maintain the original state of the latex <i>Menjadi pengawet untuk mengekalkan keadaan asal lateks</i>
D.	Water <i>Air</i>	To make the latex more dilute <i>Menjadikan lateks lebih cair.</i>

48. Element W react with element X to form an ionic compound with formula  $\text{WX}_2$ . The electron arrangement of an atom of X is 2.8.7. Which of the following is a possible electron arrangement of an atom of W?

*Unsur W bertindak balas dengan unsur X untuk membentuk suatu sebatian ion yang mempunyai formula  $\text{WX}_2$ . Susunan elektron bagi atom X ialah 2.8.7.*

*Antara yang berikut, yang manakah susunan elektron yang mungkin bagi atom W?*

- A. 2.8.1
- B. 2.8.2
- C. 2.8.4
- D. 2.8.6

49. Uranium-235 and uranium-238 are isotopes. Which statement is correct?

[Proton number of uranium= 92]

*Uranium-235 dan uranium -238 adalah isotop. Pernyataan manakah yang betul?*

*[Nombor proton uranium=92]*

A. Uranium-235 has 92 protons and 143 electrons

*Uranium-235 mempunyai 92 proton dan 143 elektron.*

B. Uranium-238 has 92 protons and 146 neutrons

*Uranium-238 mempunyai 92 proton dan 146 neutron.*

C. Uranium-235 has less number of electrons than uranium-238

*Uranium-235 mempunyai bilangan elektron kurang daripada uranium-238*

D. Uranium-235 has the same number of neutrons as uranium-238

*Uranium-235 mempunyai bilangan neutron yang sama dengan uranium-238*





50. Diagram 5 shows an apparatus set-up for a chemical cell prepared by a chemistry teacher.  
*Rajah 5 menunjukkan susunan radas bagi sel kimia yang disediakan oleh seorang guru kimia*

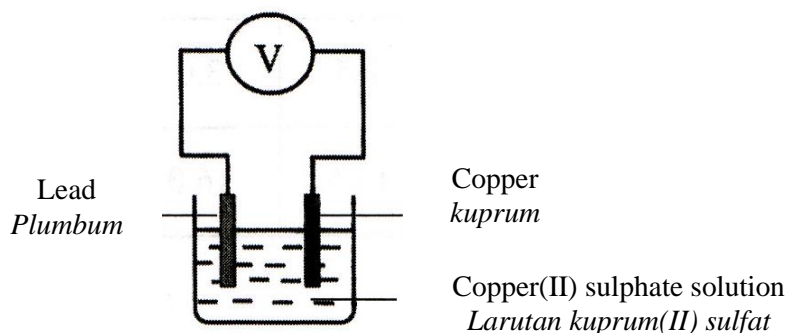


Diagram 5  
*Rajah 5*

The teacher asked one student to modify the chemical cell so that the voltmeter would give a higher reading. What modification should the student make?

*Guru itu meminta seorang murid mengubahsuaikan sel kimia itu supaya voltmeter memberikan bacaan yang lebih tinggi. Apakah pengubahsuaian yang perlu dilakukan oleh murid itu?*

- A. Reduce the distance between the two metal plate.  
*Kurangkan jarak antara dua kepingan logam*
- B. Use a wider metal plate.  
*Gunakan kepingan logam yang lebih besar*
- C. Substitute the lead with the magnesium  
*Gantikan plumbum dengan magnesium*
- D. Use aluminium sulphate solution as the electrolyte.  
*Gunakan larutan aluminium sulfat sebagai elektrolit.*

**END OF QUESTION PAPER**  
***KERTAS SOALAN TAMMAT***