CONFIDENTIAL
4541/1
Chemistry
Paper 1
September
2010
1 1/4 hour

SPM TRIAL EXAMINATION 2010
MAKTAB RENDAH SAINS MARA

CHEMISTRY

Paper 1

One hour and fifteen minutes

DO NOT OPEN THE QUESTION BOOKLET UNTIL BEING TOLD TO DO SO.

1 *This question booklet is bilingual*
Kertas soalan ini adalah dalam dwibahasa

2 *Candidates are advised to read INFORMATION FOR CANDIDATES on page 28*
Calon dikehendaki membaca MAKLUMAT UNTUK PELAJAR di halaman 28

This question booklet has 25 printed pages

1 Which of the following scientists discovered proton?
Antara saintis berikut, yang manakah menemui proton?

A Neils Bohr

B J. J Thomson

C James Chadwick

D Ernest Rutherford

2 Which of the following is the empirical formula of $C_6H_{12}O_6$?
Antara berikut,yang manakah formula empirik bagi $C_6H_{12}O_6$?

A CHO

B CH_2O

C $C_2H_4O_2$

D $C_6H_{12}O_6$

3 Calcium carbonate, $CaCO_3$ is the main component of marble. How many moles of atom of each element is present in 1 mol of calcium carbonate?
Kalsium karbonat, $CaCO_3$ *adalah komponen utama dalam marmar. Berapakah bilangan mol atom setiap unsur dalam* 1 *mol kalsium karbonat*?

	Calcium, Ca ***Kalsium,* Ca**	**Carbon, C** ***Karbon,* C**	**Oxygen, O** ***Oksigen,* O**
A	1	1	3
B	2	1	3
C	1	2	6
D	2	2	6

4 What is the factor that determines the chemical properties of an element?
Apakah faktor yang menentukan sifat kimia sesuatu unsur?

A The number of proton in an atom
Bilangan proton dalam satu atom

B The number of neutrons in the nucleus
Bilangan neutron di dalam nukleus

C The number of electrons in the outer most shell
Bilangan elektron pada petala terluar

D The number of electrons in an atom
Bilangan elektron dalam satu atom

[Lihat halaman sebelah

5 Table 1 shows the proton number for four elements in the Periodic Table.
Jadual 1 *menunjukkan nombor proton bagi empat unsur dalam Jadual Berkala.*

Elements ***Unsur***	**Proton Number** ***Nombor proton***
T	3
U	6
V	11
W	17

Table 1
Jadual 1

Which of the following pairs of elements are placed in the same group in the Periodic Table?
Antara pasangan unsur berikut, yang manakah berada dalam kumpulan sama dalam Jadual Berkala?

A T and U
T *dan* U

B V and W
V *dan* W

C T and V
T *dan* V

D U and W
U *dan* W

6 During the formation of ionic bonds, the atoms of elements
Dalam pembentukkan ikatan ion, atom-atom unsur

A share electrons
berkongsi elektron

B accept electrons
menerima elektron

C donate electrons
menderma elektron

D transfer electrons
memindah elektron

7 Which of the following is an example of electrolyte?
Antara berikut, yang manakah adalah contoh elektrolit?

A Sugar solution
Larutan gula

B Molten naphthalene
Leburan naftalena

C Solid sodium chloride
Pepejal natrium klorida

D Molten lead(II) bromide
Leburan plumbum(II) *bromida*

8 What are the cations present in zinc sulphate solution?
Apakah kation yang hadir dalam larutan zink sulfat?

A Zn^{2+}, H^+

B Zn^{2+}, SO_4^{2-}

C OH^-, SO_4^{2-}

D Zn^{2+}, H^+, OH^-, SO_4^{2-}

9 Why ammonia solution is a weak alkali?
Mengapakah larutan ammonia sejenis alkali lemah ?

A It has high pH value
Ia mempunyai nilai pH *yang tinggi*

B It dissociates partially in water
Ia tercerai separa dalam air

C It contains a lot of ammonium ions
Ia mengandungi banyak ion ammonium

D It produces high concentration of hydroxide ions in the water
Ia menghasilkan kepekatan ion hidroksida yang tinggi di dalam air

10 Which of the following chemical equations represents the formation of oleum in Contact Process?
Antara persamaan kimia berikut, manakah mewakili penghasilan oleum dalam Proses Sentuh?

A $S + O_2 \rightarrow SO_2$

B $2\ SO_2 + O_2 \rightarrow 2\ SO_3$

C $SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$

D $H_2S_2O_7 + H_2O \rightarrow 2\ H_2SO_4$

[Lihat halaman sebelah

11 An alloy which is used to make surgical forceps has the following composition:
Sejenis aloi yang digunakan untuk membuat forsep pembedahan mempunyai komposisi berikut:

Iron *Besi*	-	74 %
Chromium *Kromium*	-	18 %
Carbon *Karbon*	-	8 %

This alloy is strong and does not corrode easily. What is this alloy?
Aloi ini kuat dan tidak mudah terkakis. Apakah aloi ini?

A Bronze
Gangsa

B Pewter
Piuter

C Duralumin
Duralumin

D Stainless steel
Keluli nirkarat

12 Diagram 1 shows standard representation of chlorine isotopes.
Rajah 1 *menunjukkan wakilan piawai isotop-isotop bagi klorin.*

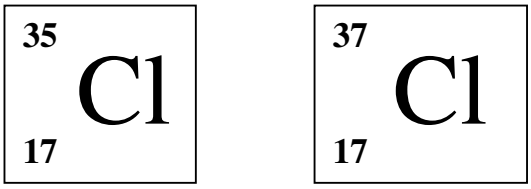


Diagram 1
Rajah 1

Both isotopes have
Kedua-dua isotop mempunyai

A different number of valence electrons
bilangan elektron valens yang berbeza

B different chemical properties
sifat kimia yang berbeza

C same number of neutrons
bilangan neutron yang sama

D same number of protons
bilangan proton yang sama

13 Which of the following is/are weak acid?
Antara berikut, yang manakah merupakan asid lemah?

I HCl

II HNO_3

III H_2SO_4

IV CH_3COOH

A I only
I *sahaja*

B I and II
I *dan* II

C III and IV
III *dan* IV

D IV only
IV *sahaja*

14 What should be added to latex so that it stays in liquid form?
Apakah yang perlu ditambahkan kepada lateks bagi mengekalkannya dalam bentuk cecair?

A Ethanol
Etanol

B Ethanoic acid
Asid etanoik

C Ammonia solution
Larutan ammonia

D Hydrochloric acid
Asid hidroklorik

15 Diagram 2 shows the mixture of liquid Z and water in a test tube.
Rajah 2 *menunjukkan campuran cecair* Z *dan air dalam tabung uji.*

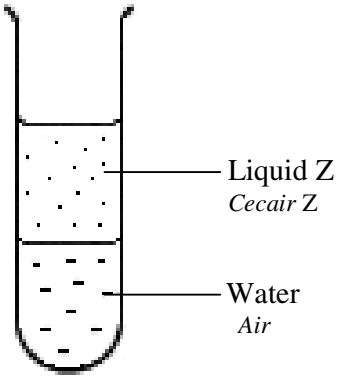


Diagram 2
Rajah 2

Which of the following is liquid Z?
Antara berikut, yang manakah merupakan cecair Z?

A Glucose
Glukosa

B Ethanol
Etanol

C Ethanoic acid
Asid etanoik

D Ethyl ethanoate
Etil etanoat

16 Which of the following chemical reactions is a redox reaction?
Antara tindak balas kimia berikut, yang manakah merupakan satu tindak balas redoks?

A Displacement
Penyesaran

B Neutralisation
Peneutralan

C Hydrogenation
Penghidrogenan

D Halogenation
Penghalogenan

17 Diagram 3 shows the rusting process of an iron nail when paired with metal X.
Rajah 3 *menunjukkan proses pengaratan paku besi bila dipasangkan dengan logam* X.

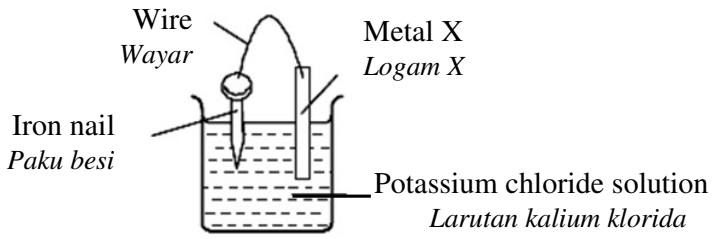


Diagram 3
Rajah 3

The rate of rusting is the highest when X is
Kadar pengaratan adalah paling tinggi apabila X *adalah*

A zinc
zink

B silver
argentum

C lead
plumbum

D magnesium
magnesium

18 Which of the following pairs of additive in detergent and its function is correct?
Antara pasangan berikut, manakah bahan tambah detergen dan fungsinya yang benar?

	Additives in detergent ***Bahan tambah detergen***	**Function** ***Fungsi***
A	Sodium perborate *Natrium perborat*	To convert stains into colourless substances *Menukarkan kotoran kepada bahan tidak berwarna*
B	Sodium tripoliphosphate *Natrium tripolifosfat*	To enable detergent to be poured easily *Memudahkan detergen dituang dengan mudah*
C	Sodium silicate *Natrium silikat*	To remove protein stains *Menanggalkan kotoran berprotein*
D	Sodium sulphate *Natrium sulfat*	To soften the water *Melembutkan air*

19 Diagram 4 shows the application of chemical reactions in daily life.
Rajah 4 *menunjukkan aplikasi tindak balas kimia dalam kehidupan seharian.*

Materials *Bahan-bahan*		
Name *Nama*	Cold pack *Pek sejuk*	Hot pack *Pek panas*
Chemicals used *Bahan kimia yang digunakan*	M and water M *dan air*	N and water N *dan air*

Diagram 4
Rajah 4

What is M and N?
Apakah M *dan* N*?*

	Material M ***Bahan* M**	**Material N** ***Bahan* N**
A	Ammonium nitrate *Ammonium nitrat*	Anhydrous magnesium sulphate *Magnesium sulfat kontang*
B	Ammonium hydroxide *Ammonium hidroksida*	Calcium chloride *Kalsium klorida*
C	Sodium carbonate *Natrium karbonat*	Sodium hydroxide *Natrium hidroksida*
D	Sodium acetate *Natrium asetat*	Sodium bicarbonate *Natrium bikarbonat*

20

A student has a whooping cough.
He went to a clinic and the doctor prescribed streptomycin.
Seorang pelajar mengalami batuk kokol.
Dia pergi ke klinik dan doktor memberinya streptomisin.

What type of medicine is streptomycin?
Apakah jenis ubat streptomisin?

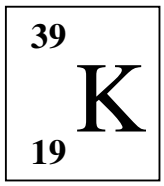
A Analgesic
Analgesik

B Antibiotic
Antibiotik

C Antipsychotic
Antipsikotik

D Psychotherapeutic
Psikoteraputik

21 The following shows a standard representation of potassium atom, K.
Berikut adalah wakilan piawai bagi atom kalium K.



Which is the correct electron arrangement for potassium?
Susunan elektron manakah yang betul bagi kalium?

A 2.8.8.1

B 2.8.8.2

C 2.8.1

D 2.8.2

22 Table 2 shows the melting and boiling points of substances V, W, X and Y.
Jadual 2 *menunjukkan takat lebur dan takat didih bahan* V, W, X *dan* Y.

Substances ***Bahan-bahan***	**Melting point (^oC)** ***Takat lebur*** **(^oC)**	**Boiling point (^oC)** ***Takat didih*** **(^oC)**
V	– 23	7
W	64	298
X	– 256	– 192
Y	12	135

Table 2
Jadual 2

Which of the following substances is in liquid form at room temperature?
Antara bahan berikut, manakah merupakan cecair pada suhu bilik ?

A V

B W

C X

D Y

23 Why the reactivity of Group 1 elements increases when going down the group?
Mengapa kereaktifan unsur Kumpulan 1 *meningkat apabila menuruni kumpulan*?

A The size of atom decreases
Saiz atom semakin berkurang

B The density of element increases
Ketumpatan unsur semakin meningkat

C The ability of the atom to donate valence electron increases
Keupayaan atom menderma elektron valens semakin meningkat.

D The attraction between nucleus and the valence electron become stronger
Daya tarikan antara nukleus dan elektron valens semakin kuat

24 Table 3 shows the electron arrangement of atoms J and L.
Jadual 3 *menunjukkan susunan elektron bagi atom* J *dan* L.

Atom	**Electron arrangement** ***Susunan elektron***
J	2.8.2
L	2.8.7

Table 3
Jadual 3

Which of the following is true for the compound formed when J reacts with L?
Antara berikut manakah benar bagi sebatian yang terbentuk apabila J *bertindak balas dengan* L?

	Type of bonding ***Jenis ikatan***	**Able to conduct electricity** ***Boleh mengkonduksikan elektrik***
A	Ionic *Ionik*	in aqueous and molten state *dalam keadaan akueus dan leburan*
B	Covalent *Kovalen*	in aqueous and molten state *dalam keadaan akueus dan leburan*
C	Covalent *Kovalen*	in aqueous state only *dalam keadaan akueus sahaja*
D	Ionic *Ionik*	in molten state only *dalam keadaan leburan sahaja*

25 Diagram 5 shows a chemical cell using magnesium and copper as the electrodes.
Rajah 5 menunjukkan sel kimia menggunakan magnesium dan kuprum sebagai elektrod.

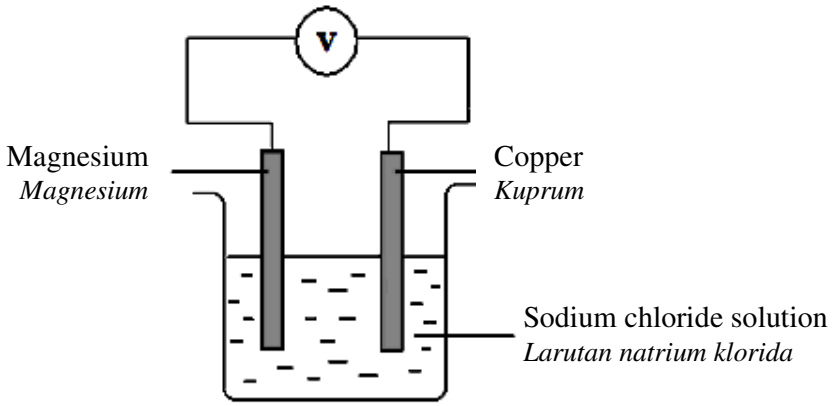


Diagram 5
Rajah 5

Which of the following half equations represents the reaction at the copper electrode?
Antara persamaan setengah berikut, yang manakah mewakili tindak balas yang berlaku di elektrod kuprum?

A $Cu \rightarrow Cu^{2+} + 2e$

B $2H^{+} + 2e \rightarrow H_2$

C $Cu^{2+} + 2e \rightarrow Cu$

D $2Cl^{-} \rightarrow Cl_2 + 2e$

26 The pH of 0.1 mol dm^{-3} hydrochloric acid, HCl and 0.1 mol dm^{-3} sulphuric acid, H_2SO_4 are not the same because
pH *asid hidroklorik,* HCl 0.1 mol dm^{-3} *dan asid sulfurik,* H_2SO_4 0.1 mol dm^{-3} *berbeza kerana*

A HCl does not ionize completely in water
HCl *tidak mengion lengkap dalam air*

B concentration of H^{+} ions in H_2SO_4 is higher than HCl
kepekatan ion H^{+} *dalam* H_2SO_4 *lebih tinggi dari* HCl

C number of ions in H_2SO_4 is more than HCl
bilangan ion dalam H_2SO_4 *lebih banyak dari* HCl

D The strength of HCl and H_2SO_4 are not the same
Kekuatan HCl *dan* H_2SO_4 *adalah berbeza*

27 Diagram 6 shows the reaction of lead(II) nitrate with solution X.
Rajah 6 *menunjukkan tindak balas antara plumbum*(II) *nitrat dengan larutan* X.

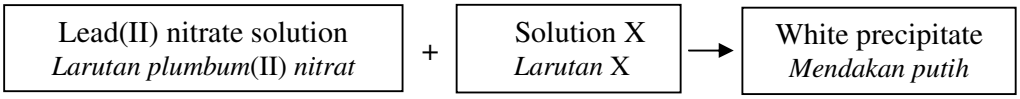


Diagram 6
Rajah 6

What is the solution X?
Apakah larutan X?

A Potassium iodide
Kalium iodida

B Sodium chromate
Natrium kromat

C Sodium chloride
Natrium klorida

D Potassium bromide
Kalium bromida

28 Pure metals are ductile and malleable. This is because
Logam tulen adalah mulur dan boleh ditempa. Ini adalah kerana

A atoms can move freely
atom-atom boleh bergerak bebas

B layers of atoms can slide easily
lapisan atom-atom boleh menggelongsor dengan mudah

C bonding between atoms are weak
ikatan antara atom-atom adalah lemah

D atoms are orderly and closely packed
atom-atom tersusun secara teratur dan padat

29 Diagram 7 shows a graph of the volume of gas produced against time for the reaction between zinc granules and hydrochloric acid.
Rajah 7 menunjukkan graf isipadu gas yang dihasilkan melawan masa bagi tindak balas antara ketulan zink dan asid hidroklorik.

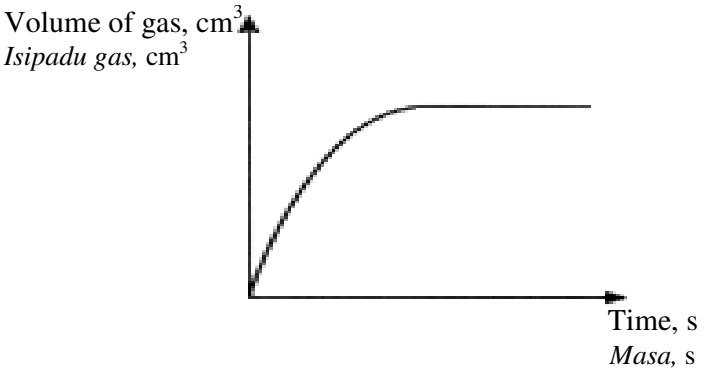


Diagram 7
Rajah 7

The gradient of the graph decreases with time because
Kecerunan graf berkurang dengan masa kerana

A catalyst is not used
mangkin tidak digunakan

B volume of mixture decreases
isipadu campuran berkurang

C temperature of reaction decreases
suhu tindak balas berkurang

D concentration of hydrochloric acid decreases
kepekatan asid hidroklorik berkurang

30 Magnesium reacts with acid to produce hydrogen gas, H_2.
Which solution would give the highest initial rate of reaction?
Magnesium bertindak balas dengan asid untuk menghasilkan gas hidrogen, H_2.
Larutan manakah akan memberikan kadar awal tindak balas yang tertinggi?

A 100 cm^3 of 1.0 mol dm^{-3} of nitric acid, HNO_3
100 cm^3 *asid nitrik,* HNO_3 1.0 mol dm^{-3}

B 100 cm^3 of 1.0 mol dm^{-3} of hydrochloric acid, HCl
100 cm^3 *asid hidroklorik,* HCl 1.0 mol dm^{-3}

C 100 cm^3 of 1.0 mol dm^{-3} of sulphuric acid, H_2SO_4
100 cm^3 *asid sulfurik,* H_2SO_4 1.0 mol dm^{-3}

D 100 cm^3 of 1.0 mol dm^{-3} of ethanoic acid, CH_3COOH
100 cm^3 *etanoik asid,* CH_3COOH 1.0 mol dm^{-3}

31 Both ethane and ethene
Kedua-dua etana dan etena

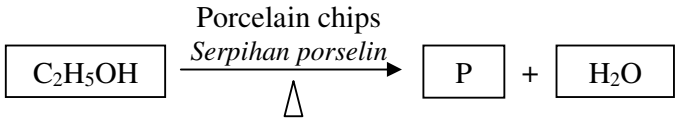
A have the same general formula
mempunyai formula am yang sama

B have similar physical properties
mempunyai sifat fizik yang sama

C can decolourise brown bromine water
boleh menyahwarnakan larutan perang air bromin

D burn completely in air to produce carbon dioxide gas and water
terbakar lengkap dalam udara menghasilkan gas karbon dioksida dan air

32 The following equation represents a chemical reaction of ethanol.
Persamaan berikut mewakili satu tindak balas kimia bagi etanol.



What can be used to identify substance P?
Apakah yang boleh digunakan untuk mengenal pasti bahan P?

A Bromine water
Air bromin

B Chlorine water
Air klorin

C Hydrogen gas
Gas hidrogen

D Phosphoric acid
Asid fosforik

33 The following equation shows the reaction between copper(II) oxide and carbon.
Persamaan berikut menunjukkan tindak balas antara kuprum(II) *oksida dengan karbon.*

$$2CuO + C \rightarrow CO_2 + 2Cu$$

Which of the following statements is true about the reaction?
Antara kenyataan berikut, yang manakah benar mengenai tindak balas itu?

A Carbon is an oxidising agent
Karbon ialah agen pengoksidaan

B Copper(II) oxide is a reducing agent
Kuprum(II) *oksida ialah agen penurunan*

C Carbon is reduced to carbon dioxide
Karbon diturunkan kepada karbon dioksida

D Copper(II) oxide is reduced to copper.
Kuprum(II) *oksida diturunkan kepada kuprum*

34 When 50 cm^3 of 1.0 mol dm^{-3} nitric acid is mixed with 50 cm^3 of 1.0 mol dm^{-3} sodium hydroxide solution the temperature increases by 6.0 ^oC .
What is the temperature change if the experiment is repeated using 50 cm^3 of 2.0 mol dm^{-3} nitric acid with 50 cm^3 of 1.0 mol dm^{-3} sodium hydroxide?
Apabila 50 cm^3 *asid nitrik* 1.0 mol dm^{-3} *dicampurkan dengan* 50 cm^3 *natrium hidroksida* 1.0 mol dm^{-3}*, suhu bertambah sebanyak* 6.0 ^oC.
Berapakah perubahan suhu jika eksperimen diulangi menggunakan 50 cm^3 *asid nitrik* 2.0 mol dm^{-3} *dengan* 50 cm^3 *natrium hidroksida* 1.0 mol dm^{-3}*?*

A 3.0 ^oC

B 6.0 ^oC

C 9.0 ^oC

D 12.0 ^oC

35 A student carries out an experiment to determine the heat of combustion of propanol. Which of the following information does he need in order to calculate the heat of combustion?
Seorang pelajar menjalankan eksperimen untuk menentukan haba pembakaran bagi propanol. Antara maklumat berikut, yang manakah diperlukan untuk menentukan haba pembakaran propanol?

I Mass of water
Jisim air

II Volume of propanol
Isipadu propanol

III Initial temperature of propanol
Bacaan suhu awal propanol

IV Highest temperature of water
Bacaan suhu tertinggi air

A I and II
I *dan* II

B I and IV
I *dan* IV

C II and III
II *dan* III

D III and IV
III *dan* IV

36 Table 5 shows four elements and their proton numbers.
Jadual 5 *menunjukkan empat unsur dan bilangan proton.*

Element ***Unsur***	**Proton number** ***Nombor proton***
P	8
Q	11
R	17
S	16

Table 5
Jadual 5

Given the proton number of flourine is 9, which of the following elements has similar chemical properties to it?
Jika nombor proton bagi florin ialah 9*, manakah antara unsur berikut mempunyai sifat kimia yang sama dengannya*?

A P

B Q

C R

D S

37 Table 6 shows the electron arrangement and nucleon number for atoms E and G.
Jadual 6 *menunjukkan susunan elektron dan nombor nukleon bagi atom* E *dan* G.

	Atom E	**Atom G**
Electron arrangement *Susunan elektron*	2.8.3	2.8.7
Nucleon number *Nombor nukleon*	27	35

Table 6
Jadual 6

Based on Table 6, what is the relative molecular mass for compound formed when E reacts with G?
Berdasarkan Jadual 6*, apakah jisim molekul relatif bagi sebatian yang terbentuk apabila atom* E *bertindak balas dengan atom* G?

A 62

B 64

C 97

D 132

38 An element J forms compound JCl_3 with chlorine and JSO_4 with sulphate ion.
Which of the following is true for this element?
Unsur J *membentuk sebatian* JCl_3 *dengan klorin dan* JSO_4 *dengan ion sulfat.*
Antara berikut yang manakah benar tentang unsur ini?

A J is a transition metal
J *adalah logam peralihan*

B J is an alkali metal
J *adalah logam alkali*

C J is a Group 2 element
J *adalah unsur Kumpulan* 2

D J is halogen
J *adalah halogen.*

39 R reacts with S to form ionic compound with a formula of R_2S_3.
Which of the following electron arrangements are true for R and S atoms?
R *bertindak balas dengan* S *membentuk sebatian ion dengan formula* R_2S_3.
Antara susunan elektron berikut yang manakah benar bagi atom R *dan* S*?*

	Electron arrangement of R atom ***Susunan elektron atom* R**	**Electron arrangement of S atom** ***Susunan elektron atom* S**
A	2.1	2.7
B	2.2	2.8.5
C	2.8.3	2.6
D	2.8.8.2	2.8.6

40 Table 7 shows the potential differences for three simple cells.
Jadual 7 *menunjukkan beza upaya bagi tiga sel ringkas.*

Pair of metals ***Pasangan logam***	**Potential difference (V)** ***Beza upaya* (V)**	**Negative terminal** ***Kutub negatif***
K and copper K *dan kuprum*	0.4	K
L and copper L *dan kuprum*	1.3	L
M and copper M *dan kuprum*	0.6	Cu

Table 7
Jadual 7

Based on the potential values given, what is the arrangement of all metals K, L, M and copper in ascending order of electropositivity?
Berdasarkan kepada beza upaya yang diberikan, manakah susunan kesemua logam K, L, M *dan kuprum mengikut urutan keelektropositifan menaik*?

A L, K, Cu, M

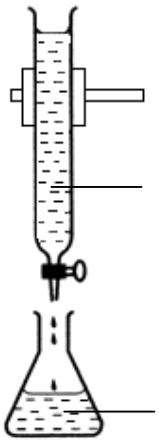
B K, L, M, Cu

C M, Cu, K, L

D Cu, K, L, M

[Lihat halaman sebelah

41 Diagram 8 shows the set-up of apparatus for the titration of sodium hydroxide solution with hydrochloric acid.
Rajah 8 *menunjukkan susunan radas bagi pentitratan larutan natrium hidroksida dengan asid hidroklorik.*



2.0 mol dm^{-3} hydrochloric acid
Asid hidroklorik 2.0 mol dm^{-3}

20 cm^3 of 1.0 mol dm^{-3} sodium hydroxide solution and phenolphthalein
20 cm^3 *larutan natrium hidroksida* 1.0 mol dm^{-3} *dan fenolftalein*

Diagram 8
Rajah 8

What is the total volume of the mixture in the conical flask at end point?
Berapakah jumlah isipadu campuran larutan di dalam kelalang kon pada takat akhir pentitratan?

A 40 cm^3
B 30 cm^3
C 20 cm^3
D 10 cm^3

42 The following equation represents the reaction between magnesium oxide and nitric acid.
Persamaan berikut mewakili tindak balas antara magnesium oksida dengan asid nitrik.

$$MgO + 2HNO_3 \rightarrow Mg(NO_3)_2 + H_2O$$

Excess magnesium oxide is reacted with 50 cm^3 of 2.0 mol dm^{-3} nitric acid.
What is the maximum mass of magnesium nitrate salt formed?
[Relative atomic mass: N = 14, O = 16, Mg = 24]
Magnesium oksida yang berlebihan bertindak balas dengan 50 cm^3 *asid nitrik* 2.0 mol dm^{-3}.
Apakah jisim maksimum garam magnesium nitrat yang terbentuk?
[*Jisim atom relatif:* N = 14, O = 16, Mg = 24]

A 1.48 g
B 3.70 g
C 4.30 g
D 7.40 g

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43 Diagram 9 shows the layout of water pipe system in a house.
Rajah 9 menunjukkan pelan kedudukan sistem saluran air bagi sebuah rumah.

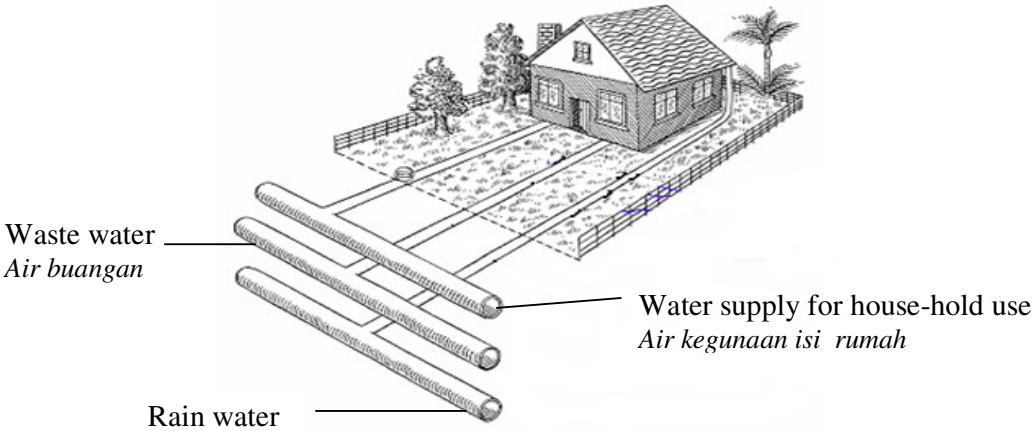

Diagram 9
Rajah 9

What are the best materials that can be used as pipes for the above purposes?
Bahan terbaik manakah boleh digunakan sebagai paip bagi tujuan di atas?

	House hold water supply ***Air kegunaan isi rumah***	**Waste water** ***Air buangan***	**Rain water** ***Air hujan***
A	Polypropene *Polipropena*	Ceramics *Seramik*	Polyvinylchloride *Polivinilklorida*
B	Lead *Plumbum*	Copper *Kuprum*	Polyvinylchloride *Polivinilklorida*
C	Fibre glass *Gentian kaca*	Steel *Keluli*	Perspex *Perpeks*
D	Polythene *Polietena*	Cast iron *Besi*	Concrete *Konkrit*

44 The following chemical equation represents the complete combustion of propane.
Persamaan kimia berikut mewakili pembakaran lengkap propana.

$$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$$

What is the volume of oxygen gas used if 5.5 g of propane is completely burnt in air?
[Relative atomic mass: H = 1, C = 12, O = 16;
Molar volume of gas = 24 dm^3 mol^{-1} at room conditions]
Berapakah isipadu gas oksigen yang digunakan jika 5.5 g *propana terbakar lengkap dalam udara*?
[*Jisim atom relatif:* H = 1, C = 12, O = 16*; Isipadu molar gas* = 24 dm^3 mol^{-1} *pada keadaan bilik*]

A 30.0 dm^3

B 15.0 dm^3

C 9.0 dm^3

D 3.0 dm^3

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45 Diagram 10 shows the set-up of apparatus of an electrolysis process.
Rajah 10 *menunjukkan susunan radas bagi satu proses elektrolisis.*

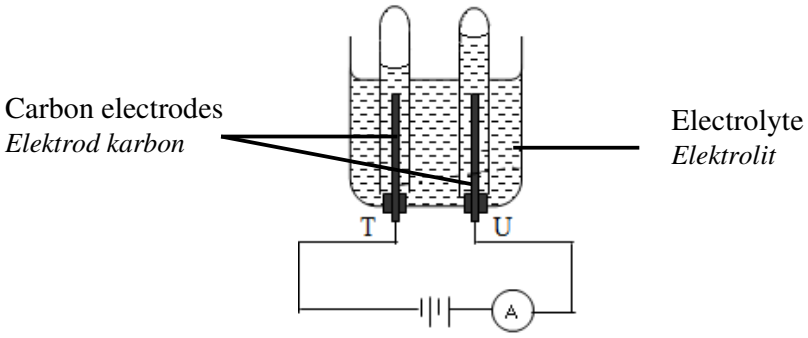


Diagram 10
Rajah 10

Which of the following electrolytes produces oxygen gas at electrode U?
Antara elektrolit berikut, yang manakah menghasilkan gas oksigen di elektrod U?

A 1.0 mol dm^{-3} sodium chloride solution
Larutan natrium klorida 1.0 mol dm^{-3}

B 1.0 mol dm^{-3} hydrochloric acid solution
Larutan asid hidroklorik 1.0 mol dm^{-3}

C 1.0 mol dm^{-3} potassium nitrate solution
Larutan kalium nitrat 1.0 mol dm^{-3}

D 1.0 mol dm^{-3} potassium bromide solution
Larutan kalium bromida 1.0 mol dm^{-3}

46 The following statements describe the particles of a substance at room temperature.
Pernyataan-pernyataan berikut menerangkan tentang zarah-zarah suatu bahan pada suhu bilik.

- The particles are far apart from each other.
Zarah-zarah adalah berjauhan antara satu sama lain.
- Forces of attraction between particles are weak.
Daya tarikan antara zarah adalah lemah.
- The particles have high kinetic energy and move randomly.
Zarah-zarah mempunyai tenaga kinetik yang tinggi dan bergerak rawak..

Which of the following substance match the criteria?
Antara bahan berikut, yang manakah memenuhi kriteria di atas?

	Substance *Bahan*	Melting point (ºC) *Takat lebur*	Boiling point (ºC) *Takat didih*
A	R	114	443
B	S	-11	44
C	T	-65	-8
D	U	20	98

47 Diagram 11 shows the preparation of standard solution of potassium hydroxide, KOH by dissolving 5.6 g of potassium hydroxide in distilled water and making the volume up to 100 cm^3.
Rajah 11 *menunjukkan penyediaan larutan piawai kalium hidroksida,* KOH *dengan melarutkan* 5.6 g *kalium hidroksida di dalam air suling dan menjadikan isipadu sehingga* 100 cm^3.

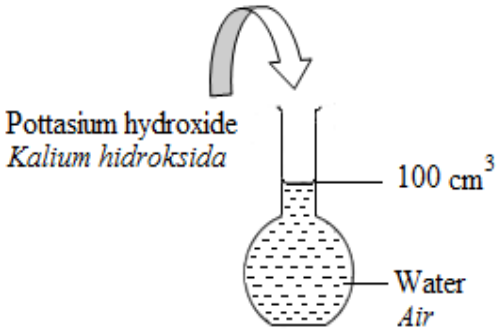


Diagram 11
Rajah 11

What is the volume of the standard solution prepared above that should be used if a student wants to prepare 50 cm^3 of 0.5 mol dm^{-3} potassium hydroxide solution?
[Relative formula mass: KOH = 56]
Berapakah isipadu larutan piawai yang disediakan di atas perlu digunakan jika seorang pelajar ingin menyediakan 50 cm^3 *larutan kalium hidroksida* 0.5 mol dm^{-3}?
[*Jisim formula relatif:* KOH = 56]

A 12.5 cm^3
B 25.0 cm^3
C 37.5 cm^3
D 50.0 cm^3

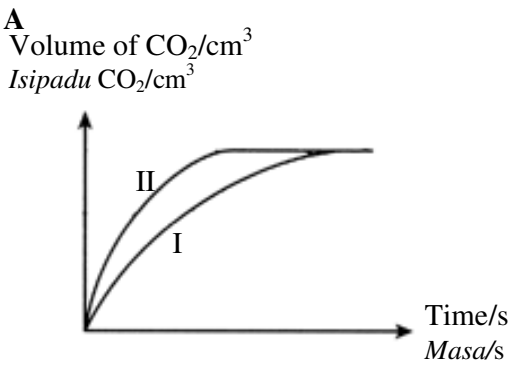
48 Table 9 shows the experiments carried out to study the rate of reaction between zinc carbonate and nitric acid.
Jadual 9 menunjukkan eksperimen yang dijalankan bagi mengkaji tindak balas antara zink karbonat dengan asid nitrik.

Experiment *Eksperimen*	Zinc carbonate, $ZnCO_3$ *Zink karbonat*		Nitric acid, HNO_3 *Asid nitrik*	
	Mass (g) *Jisim*	State *Keadaan*	Volume(cm^3) *Isipadu*	Concentration (mol dm^{-3}) *Kepekatan*
I	5	Granule *Ketulan*	50	0.1
II	5	Powder *Serbuk*	25	0.2

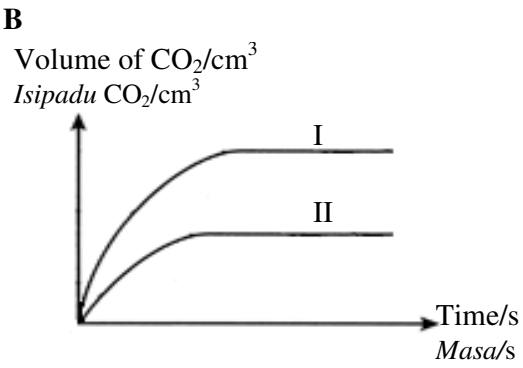
Table 9
Jadual 9

Which of the following graph represents the two experiments?
Antara graf berikut yang manakah mewakili kedua-dua eksperimen itu?

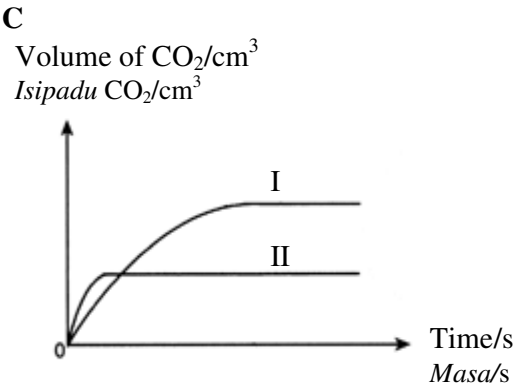
A



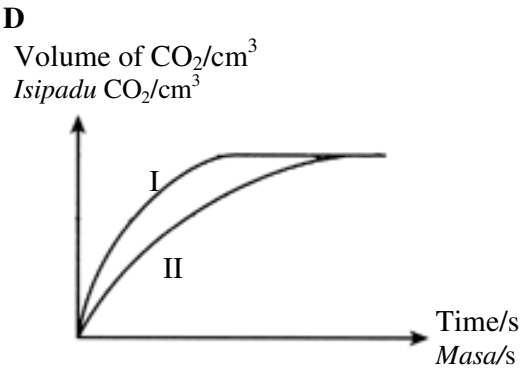
B



C



D



49 The following equations represent the displacement reaction of metals.
Persamaan-persamaan berikut mewakili tindak balas penyesaran beberapa logam.

Reaction I : $E + G^{2+} \rightarrow E^{2+} + G$
Tindak balas I

Reaction II : $L + E^{2+} \rightarrow L^{2+} + E$
Tindak balas II

Which of the following statement is true?
Antara pernyataan berikut yang manakah benar?

A E and G are oxidised
E *dan* G *teroksida*

B E is more electropositive than L.
E *adalah lebih elektropositif dari* L

C G is lower than L in the Electrochemical Series.
G *adalah di bawah* L *dalam Siri Elektrokimia.*

D G can displace E from its salt solution.
G *boleh menyesarkan* E *daripada larutan garamnya*

50 Diagram 12 shows an energy level diagram for the reaction between acid and alkali.
Rajah 12 *menunjukkan rajah aras tenaga bagi tindak balas antara asid dan alkali.*

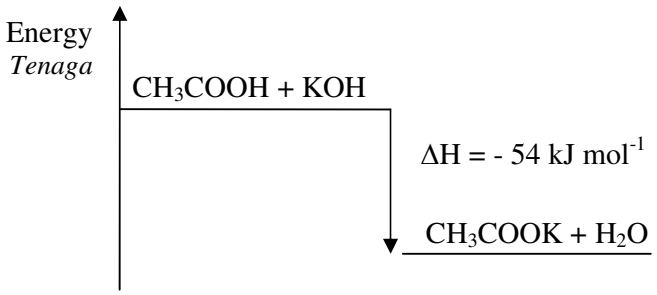


Diagram 12
Rajah 12

Calculate the amount of heat released when 50 cm^3 of 2 mol dm^{-3} ethanoic acid reacts with 50 cm^3 of 2 mol dm^{-3} potassium hydroxide solution.
Hitung jumlah haba yang dibebaskan apabila 50 cm^3 *asid etanoik* 2 mol dm^{-3} *bertindak balas dengan* 50 cm^3 *larutan kalium hidroksida* 2 mol dm^{-3}.

A 540 J

B 5400 J

C 27000 J

D 54000 J

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of 50 questions.
Kertas soalan ini mengandungi 50 soalan.

2. Answer **all** questions.
*Jawab **semua** soalan*

3. Each question is followed by four alternative answers **A, B, C** and **D**. For each question, choose **one** answer only. Blacken your answer on the objective answer sheet provided.
Tiap-tiap soalan di ikuti oleh empat pilihan jawapan, iaitu **A, B, C** *dan* **D**. *Bagi setiap soalan, pilih* **satu** *jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*

4. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the new answer.
Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.

5. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

6. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

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