PENTAKSIRAN DIAGNOSTIK AKADEMIK
SEKOLAH BERASRAMA PENUH 2020

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA
CHEMISTRY **4541/1**
Kertas 1
Oktober 2020
1 ¼ jam **Satu jam lima belas minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. *Kertas soalan ini mengandungi **50** soalan.*
2. *Jawab **semua** soalan.*
3. *Tiap-tiap soalan diikuti 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. *Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat, kemudian hitamkan jawapan yang baru.*
5. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*
6. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*

Kertas soalan ini mengandungi **29** halaman bercetak.

1 Which process occurs when a volume of water in a pot decreases during a hot day?
Proses yang manakah berlaku apabila isi padu air di dalam pasu berkurang semasa hari panas?

A Condensation
Kondensasi
B Sublimation
Pemejalwapan
C Evaporation
Penyejatan
D Boiling
Pendidihan

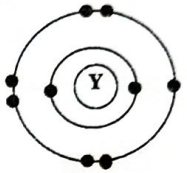
2 What is the meant by covalent bond?
Apakah yang dimaksudkan dengan ikatan kovalen?

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 menyumbang elektron kepada satu sama lain untuk mencapai susunan elektron yang stabil
B A bond formed when a metal atom transfers an electron to a non-metal atom
Ikatan yang terbentuk apabila satu atom logam memindahkan satu elektron kepada satu atom bukan logam
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 antara atom-atom bukan logam*
D A bond formed when non-metal atoms share electrons to achieve a stable electron arrangement
Ikatan yang terbentuk apabila atom-atom bukan logam berkongsi elektron untuk mencapai susunan elektron yang stabil

3 Which equation represents a neutralisation reaction?
Persamaan yang manakah mewakili satu tindak balas peneutralan?

A $2HNO_3 + Zn \rightarrow Zn(NO_3)_2 + H_2$
B $H_2SO_4 + MgO \rightarrow MgSO_4 + H_2O$
C $2HCl + CuCO_3 \rightarrow CuCl_2 + CO_2 + H_2O$
D $CH_3COOH + CH_3OH \rightarrow CH_3COOCH_3 + H_2O$

4 Diagram 4 shows the electron arrangement of an atom of element Y.
Rajah 4 menunjukkan susunan elektron bagi satu atom unsur Y.



Diagram/ *Rajah 4*

Which element reacts with Y to form a covalent compound?
Unsur yang manakah bertindak balas dengan Y untuk membentuk satu sebatian kovalen?

A Argon
Argon
B Carbon
Karbon
C Sodium
Natrium
D Magnesium
Magnesium

5 Which gas will change the moist blue litmus paper to red the fastest when the paper is placed at the same distance from the gas?
Gas yang manakah akan menukar kertas litmus biru lembap ke merah paling cepat apabila kertas itu diletakkan pada jarak yang sama daripada gas itu?

	Gas *Gas*	Molar mass ($g\ mol^{-1}$) *Jisim molar* ($g\ mol^{-1}$)
A	HCl	36.5
B	CO_2	44
C	NO_2	46
D	SO_2	64

6 Which of the following is an endothermic reaction?
Antara berikut yang manakah adalah satu tindak balas endotermik?

A Solid ammonium nitrate is dissolved in distilled water
Pepejal ammonium nitrat dilarutkan dalam air suling

B Solid sodium hydroxide is dissolved in distilled water
Pepejal natrium hidroksida dilarutkan dalam air suling

C Dilute hydrochloric acid is added to silver nitrate solution
Asid hidroklorik cair ditambahkan kepada larutan argentum nitrat

D Dilute hydrochloric acid is added to potassium hydroxide solution
Asid hidroklorik cair ditambahkan kepada larutan kalium hidroksida

7 Which of the following is the correct change in the property of elements across a period in the Periodic Table of Elements?
Antara berikut yang manakah betul tentang perubahan sifat unsur merentasi kala dalam Jadual Berkala Unsur?

A The atomic radius increases
Jejari atom meningkat

B The relative atomic mass decreases
Jisim atom relatif berkurang

C The number of protons in the atom increases
Bilangan proton dalam atom meningkat

D The number of valence electrons in the atom decreases
Bilangan elektron valens dalam atom berkurang

8 Which of the following pairs of metals in a voltaic cell gives the lowest voltmeter reading?
Antara berikut, pasangan logam manakah dalam satu sel volta yang memberikan bacaan voltmeter yang paling rendah?

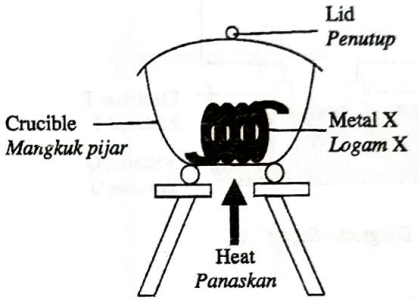
A Magnesium and copper
Magnesium dan kuprum

B Zinc and copper
Zink dan kuprum

C Iron and copper
Ferum dan kuprum

D Tin and copper
Stanum dan kuprum

9 Diagram 9 shows the set-up of apparatus to determine the empirical formula of oxide of metal X.
Rajah 9 menunjukkan susunan radas untuk menentukan formula empirik bagi oksida logam X.



Diagram/ *Rajah* 9

What is X?
Apakah X?

A Iron
Ferum

B Lead
Plumbum

C Zinc
Zink

D Copper
Kuprum

10 A solution was tested with aqueous ammonia solution. A white precipitate which is soluble in excess ammonia solution was formed.
What is the cation present in the solution?
Satu larutan diuji dengan larutan akueus ammonia. Mendakan putih yang larut dalam larutan ammonia berlebihan telah terbentuk.
Apakah kation yang hadir dalam larutan itu?

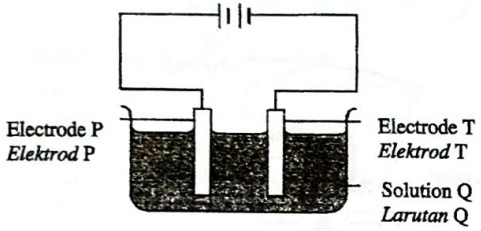
A Aluminium ion
Ion aluminium

B Calcium ion
Ion kalsium

C Magnesium ion
Ion magnesium

D Zinc ion
Ion zink

11 Diagram 11 shows the apparatus set-up to purify silver.
Rajah 11 *menunjukkan susunan radas untuk menulenkan argentum.*



Diagram/ *Rajah* 11

What are P, T and Q?
Apakah P, T *dan* Q?

	P	T	Q
A	Carbon *Karbon*	Impure silver *Argentum tak tulen*	Nitric acid *Asid nitrik*
B	Impure silver *Argentum tak tulen*	Carbon *Karbon*	Nitric acid *Asid nitrik*
C	Pure silver *Argentum tulen*	Impure silver *Argentum tak tulen*	Silver nitrate *Argentum nitrat*
D	Impure silver *Argentum tak tulen*	Pure silver *Argentum tulen*	Silver nitrate *Argentum nitrat*

12 Which of the following is the most suitable reactants used to prepare calcium sulphate?
Antara berikut, bahan tindak balas manakah yang paling sesuai digunakan untuk menyediakan kalsium sulfat?

A Calcium oxide and sulphuric acid
Kalsium oksida dan asid sulfurik
B Calcium carbonate and sulphuric acid
Kalsium karbonat dan asid sulfurik
C Calcium and zinc sulphate solution
Kalsium dan larutan zink sulfat
D Calcium nitrate solution and zinc sulphate solution
Larutan kalsium nitrat dan larutan zink sulfat

13 Table 13 shows the atomic radius and reactivity of elements in The Periodic Table of Elements.
Jadual 13 *menunjukkan jejari atom dan kereaktifan bagi unsur-unsur dalam Jadual Berkala Unsur.*

Element ***Unsur***	**Chlorine** ***Klorin***	**Bromine** ***Bromin***	**Iodine** ***Iodin***
Atomic radius (nm) *Jejari atom* (nm)	0.099	0.114	0.133
Reactivity *Kereaktifan*	High *Tinggi*	Medium *Sederhana*	Low *Rendah*

Table/ *Jadual* 13

Which of the following is correct about the elements?
Antara berikut yang manakah betul tentang unsur-unsur itu?

A Reactivity increases as the proton number increases
Kereaktifan bertambah apabila nombor proton bertambah
B Reactivity increases as the attraction force between the nucleus and the electrons increases
Kereaktifan bertambah apabila daya tarikan antara nukleus dengan elektron bertambah
C Reactivity decreases as the molar mass increases
Kereaktifan berkurang apabila jisim molar bertambah
D Reactivity decreases as the attraction between molecules increases
Kereaktifan berkurang apabila daya tarikan antara molekul bertambah

14 The following solutions have the same concentration.
Which solution has the lowest pH value?
Larutan berikut mempunyai kepekatan yang sama.
Larutan manakah yang mempunyai nilai pH *paling rendah?*

A Nitric acid
Asid nitrik
B Methanoic acid
Asid metanoik
C Calcium hydroxide
Kalsium hidroksida
D Potassium hydroxide
Kalium hidroksida

15 Which of the following is **not** a characteristic of catalyst?
Antara berikut yang manakah ***bukan*** *ciri mangkin*?

A A catalyst is specific in its reaction
Mangkin adalah khusus dalam tindak balasnya
B A catalyst affects the quantity of the products of a reaction
Mangkin mempengaruhi kuantiti hasil bagi tindak balas
C The chemical property of a catalyst remains unchanged at the end of the reaction
Sifat kimia mangkin tidak berubah pada akhir tindak balas
D Only a little amount of a catalyst is needed to alter the rate of reaction
Hanya sedikit mangkin diperlukan untuk mengubah kadar tindak balas

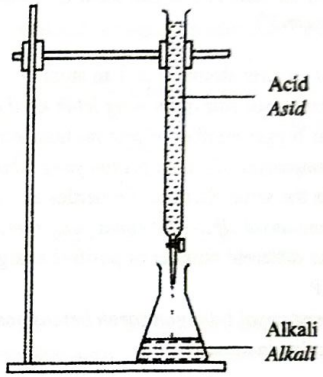
16 Which of the following is an unsaturated hydrocarbon?
Antara berikut yang manakah adalah satu hidrokarbon tak tepu?

A Alkene
Alkena
B Alkane
Alkana
C Alcohol
Alkohol
D Ester
Ester

17 Digital communication plays a very important role in modern living. Effective transmission of data, voices and images in a digital format requires a suitable material.
What is the material used?
Komunikasi digital memainkan peranan yang sangat penting dalam kehidupan moden. Penghantaran data, suara dan imej secara berkesan dalam format digital memerlukan bahan yang sesuai.
Apakah bahan yang digunakan?

A Copper
Kuprum
B Fibre optic
Gentian optik
C Fibre glass
Gentian kaca
D Superconductor
Superkonduktor

18 Diagram 18 shows the apparatus set-up in one of the steps to prepare a salt.
Rajah 18 menunjukkan susunan radas dalam salah satu langkah untuk menyediakan sejenis garam.



Diagram/ *Rajah* 18

Which salt is prepared using this method?
Garam yang manakah disediakan menggunakan kaedah ini?

A Iron(II) nitrate
Ferum(II) *nitrat*
B Lead(II) carbonate
Plumbum(II) *karbonat*
C Ammonium chloride
Ammonium klorida
D Aluminium sulphate
Aluminium sulfat

19 What is the type of food additive for vitamin C and vitamin E?
Apakah jenis bahan tambah makanan bagi vitamin C and *vitamin* E?

A Antioxidant
Pengantioksida
B Preservative
Pengawet
C Stabiliser
Penstabil
D Thickener
Pemekat

20 Atom P and atom Q have the same electron arrangement which is 2.8.7. Which of the following is correct if atom Q has two more neutrons than atom P?
Atom P *dan atom* Q *mempunyai susunan elektron yang sama iaitu* 2.8.7. *Antara berikut yang manakah betul jika atom* Q *mempunyai dua neutron lebih banyak daripada atom* P?

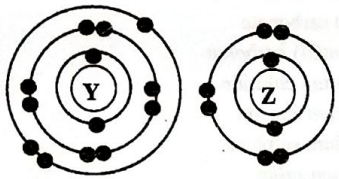
A Atom P has smaller atomic size than atom Q
Atom P *mempunyai saiz atom yang lebih kecil daripada atom* Q

B Atom Q has bigger number of protons than atom P
Atom Q *mempunyai bilangan proton yang lebih besar daripada atom* P

C Atom P has the same chemical properties as atom Q
Atom P *mempunyai sifat-sifat kimia yang sama seperti atom* Q

D Atom Q has different number of positive charge particles in its nucleus than atom P
Atom Q *mempunyai bilangan zarah bercas positif dalam nukleus yang berbeza daripada atom* P

21 Diagram 21 shows the electron arrangement of atoms of element Y and element Z. A compound is formed when element Y reacts with element Z.
Rajah 21 *menunjukkan susunan elektron bagi atom-atom unsur* Y *dan unsur* Z. *Satu sebatian terbentuk apabila unsur* Y *bertindak balas dengan unsur* Z.



Diagram/ *Rajah* 21

Which of the following is the correct physical property of the compound?
Antara berikut, sifat fizik manakah yang betul bagi sebatian itu?

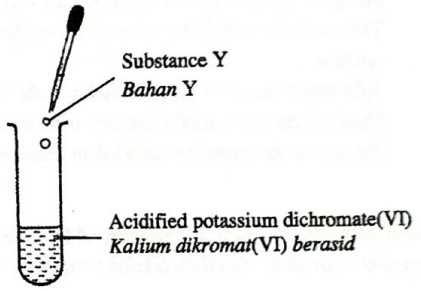
A Highly volatile
Kemeruapan yang tinggi

B *High melting point*
Takat lebur yang tinggi

C Exists as liquid at room temperature
Wujud sebagai cecair pada suhu bilik

D Does not conduct electricity in molten state
Tidak mengkonduksikan elektrik dalam keadaan leburan

22 Diagram 22 shows the set-up of apparatus to investigate a redox reaction. The solution in the test tube changes colour from orange to green when substance Y is added.
Rajah 22 *menunjukkan susunan radas untuk mengkaji satu tindak balas redoks. Larutan di dalam tabung uji itu berubah warna dari jingga ke hijau apabila bahan* Y *ditambahkan.*



Diagram/ *Rajah* 22

What is Y?
Apakah Y?

A Chlorine water
Air klorin

B Iron(III) chloride solution
Larutan ferum(III) *klorida*

C Potassium iodide solution
Larutan kalium iodida

D Acidified potassium manganate(VII) solution
Larutan kalium manganat(VII) *berasid*

23 Which substance has the same number of atoms as one mol of sulphur dioxide, SO_2?
Bahan yang manakah mempunyai bilangan atom yang sama dengan satu mol sulfur dioksida, SO_2?

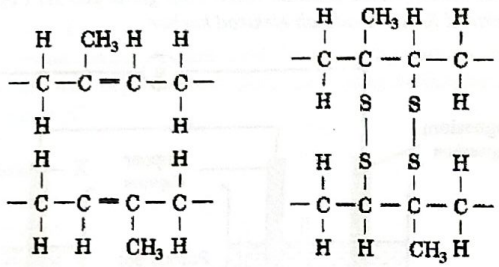
A $^1/_2$ mol chlorine gas
$^1/_2$ mol *gas klorin*

B $^3/_4$ mol ammonia
$^3/_4$ mol *ammonia*

C $^2/_3$ mol carbon dioxide
$^2/_3$ mol *karbon dioksida*

D $^1/_3$ mol methane
$^1/_3$ mol *metana*

24 Diagram 24 shows structural formulae of two types of rubber.
Rajah 24 menunjukkan formula struktur bagi dua jenis getah.



Rubber E
Getah E

Rubber G
Getah G

Diagram/ *Rajah* 24

Which of the following are the properties of rubber G compared to rubber E?
Antara berikut yang manakah adalah sifat getah G *berbanding getah* E?

I Easier oxidised
Lebih mudah teroksida
II Lower melting point
Takat lebur lebih rendah
III Stronger
Lebih kuat
IV More elastic
Lebih kenyal

A I and II
I *dan* II
B I and III
I *dan* III
C II and III
II *dan* III
D III and IV
III *dan* IV

25 Which pair of solutions produces the highest heat of neutralisation when reacted?
Pasangan larutan yang manakah menghasilkan haba peneutralan yang paling tinggi apabila bertindak balas?

A Sulphuric acid and potassium hydroxide solution
Asid sulfurik dan larutan kalium hidroksida
B Methanoic acid and potassium hydroxide solution
Asid metanoik dan larutan kalium hidroksida
C Sulphuric acid and ammonia solution
Asid sulfurik dan larutan ammonia
D Methanoic acid and ammonia solution
Asid metanoik dan larutan ammonia

26 Table 26 shows the type of bond and the chemical formula of a compound.
Jadual 26 menunjukkan jenis ikatan dan formula kimia bagi satu sebatian.

Type of bond ***Jenis ikatan***	**Chemical formula** ***Formula kimia***
Ionic *Ion*	J_2W

Table/ *Jadual* 26

Which of the following statements is correct about J and W?
Antara berikut, manakah pernyataan yang betul tentang J *dan* W?

A The electron arrangement of atom J is 2.6 while atom W is 2.8.1
Susunan elektron bagi atom J *ialah* 2.6 *manakala atom* W *ialah* 2.8.1
B Atom J has one valence electron while atom W has six valence electrons
Atom J *mempunyai satu elektron valens manakala atom* W *mempunyai enam elektron valens*
C Atom J accepts one electron while atom W releases two electrons during formation of bond
Atom J *menerima satu elektron manakala atom* W *melepaskan dua elektron semasa pembentukan ikatan*
D Atom J contributes two electrons and atom W contributes one electron to form the compound
Atom J *menyumbang dua elektron manakala atom* W *menyumbang satu elektron untuk membentuk sebatian*

27 The following equation represents a reaction.
Persamaan berikut mewakili satu tindak balas.

$$2HCl + CaCO_3 \longrightarrow CaCl_2 + CO_2 + H_2O$$

Which of the following methods is the most suitable to increase the rate of reaction?
Antara berikut, kaedah manakah yang paling sesuai untuk meningkatkan kadar tindak balas?

A Use smaller size of calcium carbonate
Menggunakan saiz kalsium karbonat yang lebih kecil
B Decrease the volume of sulphuric acid
Mengurangkan isi padu asid sulfurik
C Replace sulphuric acid with hydrochloric acid
Menukarkan asid sulfurik kepada asid hidroklorik
D Decrease the concentration of hydrochloric acid
Mengurangkan kepekatan asid hidroklorik

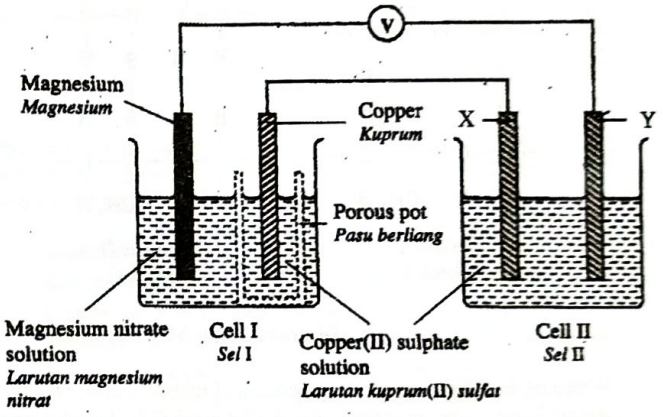
28 The following are the observation obtained for the reactions of salt R.
Berikut adalah pemerhatian yang didapati bagi tindak balas garam R.

- A white precipitate is formed when R reacts with dilute sulphuric acid
Mendakan putih terbentuk apabila R *bertindak balas dengan asid sulfurik*
- A yellow precipitate is formed when R reacts with potassium iodide solution
Mendakan kuning terbentuk apabila R *bertindak balas dengan larutan kalium iodida*

What is R?
Apakah R?

A Lead(II) nitrate
Plumbum(II) *nitrat*
B Calcium chloride
Kalsium klorida
C Sodium carbonate
Natrium karbonat
D Potassium chromate(VI)
Kalium kromat(VI)

29 Diagram 29 shows the apparatus set-up for the combination of cell I and cell II. Both electrodes X and Y are carbon electrodes.
Rajah 29 menunjukkan susunan radas bagi gabungan sel I *dan sel* II. *Kedua-dua elektrod* X *dan* Y *adalah elektrod karbon.*



Diagram/ *Rajah* 29

Which of the following ions attracted to electrode Y?
Antara berikut, ion manakah yang tertarik ke elektrod Y?

A Cu^{2+}, H^+
B Mg^{2+}, H^+
C NO_3^-, OH^-
D SO_4^{2-}, OH^-

30 Bridge pillars which are exposed to water will rust easily. In order to protect the pillars from rusting, it is usually attached to other metal.
What is the other metal used?
Tiang jambatan yang terdedah kepada air akan mudah berkarat. Bagi melindungi tiang itu daripada berkarat, ia biasanya disambungkan kepada logam lain.
Apakah logam lain yang digunakan itu?

A Tin
Stanum
B Zinc
Zink
C Silver
Argentum
D Copper
Kuprum

31 A mixture of liquid X and butanoic acid is heated slowly in the presence of a few drops of concentrated sulphuric acid. A substance with a sweet smell is produced.
What is liquid X?
Satu campuran cecair X *dan asid butanoik dipanaskan dalam kehadiran beberapa titis asid sulfurik pekat. Satu bahan yang berbau harum dihasilkan.*
Apakah cecair X?

A Hexane
Heksana
B Propanol
Propanol
C Ethanoic acid
Asid etanoik
D Ethyl butanoate
Etil butanoat

32 Burning of propane, C_3H_8 in excess oxygen releases carbon dioxide gas and water. Excess of carbon dioxide in atmosphere will cause a global warming.
What is the volume of carbon dioxide gas released if 4.4 g of propane burns completely?
[Relative atomic mass : C = 12, H = 1; Molar volume of gas at room conditions = 24 dm^3 mol^{-1}]
Pembakaran propana, C_3H_8 *dalam oksigen berlebihan akan membebaskan gas karbon dioksida dan air. Karbon dioksida yang berlebihan di atmosfera akan menyebabkan pemanasan global.*
Berapakah isi padu gas karbon dioksida yang terbebas jika 4.4 g *propana terbakar dengan lengkap?*
[*Jisim atom relatif* : C = 12, H = 1; *Isi padu molar gas pada keadaan bilik* = 24 dm^3 mol^{-1}]

A 0.1 dm^3
B 0.3 dm^3
C 2.4 dm^3
D 7.2 dm^3

33 Table 33 shows the concentration and pH values for two different solutions.
Jadual 33 *menunjukkan kepekatan dan nilai* pH *bagi dua larutan berbeza.*

Solution *Larutan*	Concentration (mol dm^{-3}) *Kepekatan* (mol dm^{-3})	pH
V	0.05	1.3
U	0.05	4.4

Table/ *Jadual* 33

Which statements explain why both solutions have different pH values?
Pernyataan yang manakah menerangkan mengapa kedua-dua larutan mempunyai nilai pH *berbeza*?

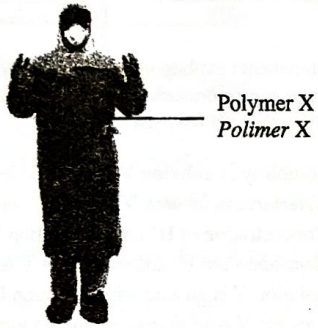
I Solubility of solution V in water is lower than solution U
Keterlarutan larutan V *dalam air lebih rendah daripada larutan* U
II Concentration of H^+ ions in solution V is higher than solution U
Kepekatan ion H^+ *dalam larutan* V *lebih tinggi daripada larutan* U
III Solution V is an acid while solution U is an alkali
Larutan V *adalah asid manakala larutan* U *adalah alkali*
IV Degree of ionisation of solution V in water is higher than solution U
Darjah pengionan larutan V *dalam air lebih tinggi daripada larutan* U

A I and III
I *dan* III
B I and IV
I *dan* IV
C II and III
II *dan* III
D II and IV
II *dan* IV

34 What is the number of hydrogen atoms in 8 g of methane?
[Relative atomic mass : C = 12, H = 1, Avogadro constant = 6.02×10^{23} mol^{-1}]
Berapakah bilangan atom hidrogen dalam 8 g *metana*?
[Jisim atom relatif : C = 12, H = 1, *Pemalar* Avogadro = 6.02×10^{23} mol^{-1}]

A 3.01×10^{23}
B 6.02×10^{23}
C 1.204×10^{24}
D 4.816×10^{24}

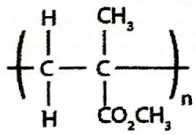
35 The Covid-19 outbreak hit the world population in December 2019. Diagram 35 shows the personal protective equipment (PPE) worn by health workers in dealing with the epidemic.
Wabak Covid-19 *telah melanda penduduk dunia pada bulan Disember* 2019. *Rajah* 35 *menunjukkan peralatan perlindungan diri* (PPE) *yang dipakai oleh petugas kesihatan dalam menangani wabak ini.*



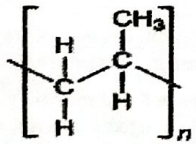
Diagram/ *Rajah* 35

What is the structural formula for polymer X?
Apakah formula struktur bagi polimer X?

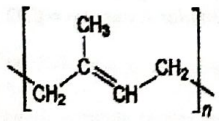
A



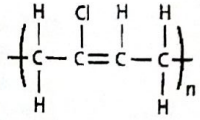
B



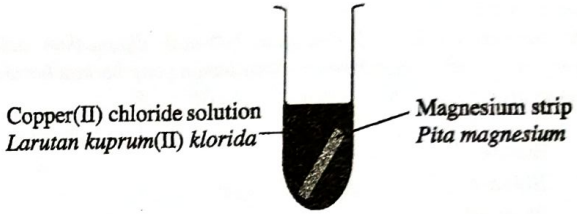
C



D



36 Diagram 36 shows the apparatus set-up for a displacement reaction.
Rajah 36 *menunjukkan susunan radas bagi satu tindak balas penyesaran.*



Diagram/ *Rajah* 36

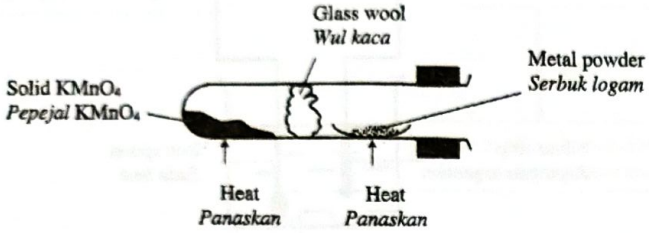
Which statement is correct about the reaction?
Pernyataan manakah yang betul tentang tindak balas itu?

A Copper(II) ion is oxidised
Ion kuprum(II) *dioksidakan*
B Copper undergoes reduction
Kuprum mengalami penurunan
C Magnesium releases electron
Magnesium melepaskan elektron
D Oxidation number of magnesium decreases
Nombor pengoksidaan magnesium berkurang

37 Sulphur dioxide is one of the food additives used in carbonated drinks.
Which of the following is correct about the function of sulphur dioxide?
Sulfur dioksida adalah salah satu daripada bahan tambah makanan yang digunakan dalam minuman berkarbonat.
Antara berikut yang manakah betul tentang fungsi sulfur dioksida?

A Gives the sour taste
Memberikan rasa masam
B Retain the colour
Mengekalkan warna
C Produces more gas bubbles
Menghasilkan lebih banyak gelembung gas
D Slow down the growth of bacteria
Melambatkan pertumbuhan bakteria

38 Diagram 38 shows the set-up of apparatus for an experiment to construct the reactivity series of metals.
Rajah 38 menunjukkan susunan radas dalam satu eksperimen untuk membina siri kereaktifan logam.



Diagram/ *Rajah* 38

Table 38 shows the observations when metals P, Q, R and S are heated strongly.
Jadual 38 menunjukkan pemerhatian apabila logam P, Q, R dan S dipanaskan dengan kuat.

Metal *Logam*	Observation *Pemerhatian*
P	Burns quickly with a bright flame. A yellow residue when hot and white when cold is formed. *Terbakar cepat dengan nyalaan terang. Baki berwarna kuning semasa panas dan putih semasa sejuk terbentuk.*
Q	Burns vigorously with a very bright flame. A white residue is formed. *Terbakar cergas dengan nyalaan sangat terang. Baki berwarna putih terbentuk.*
R	Glows dimly. A black residue is formed. *Berbara malap. Baki berwarna hitam terbentuk.*
S	Glows brightly. A brown residue when hot and yellow when cold is formed. *Berbara terang. Baki berwarna perang semasa panas dan kuning apabila sejuk terbentuk.*

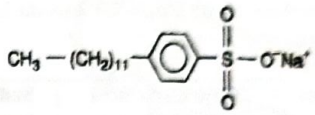
Table/ *Jadual* 38

Which of the following is the correct ascending order of the metals in the reactivity series?
Antara berikut, susunan secara menaik manakah yang betul bagi logam-logam itu dalam siri kereaktifan logam?

A R, S, P, Q
B Q, P, S, R
C S, R, Q, P
D P, Q, R, S

[Lihat Halaman Sebelah
SULIT

39 Diagram 39 show a structural formula of a compound.
Rajah 39 menunjukkan formula struktur bagi satu sebatian.



Diagram/ *Rajah* 39

Which of the following is correct about the compound?
Antara berikut yang manakah betul tentang sebatian itu?

A Can be decomposed by bacteria
Boleh diuraikan oleh bakteria
B Forming precipitate when it is used in sea water
Membentuk mendakan apabila ia digunakan dalam air laut
C Forming insoluble salts when reacted with hard water
Membentuk garam tak terlarutkan apabila bertindak balas dengan air liat
D Can remove the grease on cloth in magnesium sulphate solution
Boleh menanggalkan gris pada kain dalam larutan magnesium sulfat

40 The reaction between 50 cm^3 of 2.0 mol dm^{-3} nitric acid and 50 cm^3 of 2.0 mol dm^{-3} potassium hydroxide solution releases 5040 J of heat energy.
What is the temperature change of the mixture?
[Specific heat capacity of solution = 4.2 J g^{-1} °C^{-1};
Density of solution = 1.0 g cm^{-3}]
Tindak balas antara 50 cm^3 *asid nitrik* 2.0 mol dm^{-3} *dan* 50 cm^3 *larutan kalium hidroksida* 2.0 mol dm^{-3} *membebaskan* 5040 J *tenaga haba.*
Berapakah perubahan suhu bagi campuran itu?
[*Muatan haba tentu larutan* = 4.2 J g^{-1} °C^{-1};
Ketumpatan larutan = 1.0 g cm^{-3}]

A 3.0°C
B 6.0°C
C 12.0°C
D 24.0°C

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SULIT

41 Table 41 shows the observation when oxides of elements in Period 3 of The Periodic Table of Elements is added to dilute nitric acid and sodium hydroxide solution.
Jadual 41 *menunjukkan pemerhatian apabila oksida bagi unsur-unsur dalam Kala* 3 *Jadual Berkala Unsur ditambah kepada asid nitrik cair dan larutan natrium hidroksida.*

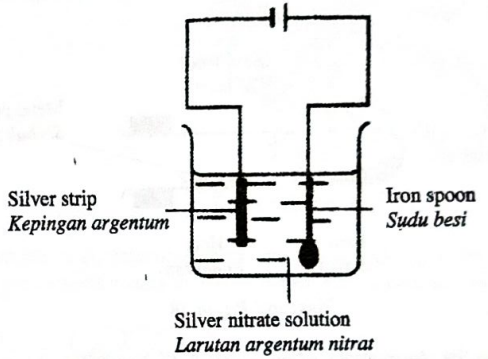
Oxide of element *Oksida unsur*	**Dilute nitric acid** *Asid nitrik cair*	**Sodium hydroxide solution** *Larutan natrium hidroksida*
X	Dissolves to form a colourless solution *Larut membentuk larutan tak berwarna*	No change *Tiada perubahan*
Y	No change *Tiada perubahan*	Dissolves to form a colourless solution *Larut membentuk larutan tak berwarna*
Z	Dissolves to form a colourless solution *Larut membentuk larutan tak berwarna*	Dissolves to form a colourless solution *Larut membentuk larutan tak berwarna*

Table/ *Jadual* 41

Which of the following shows the correct group for the elements in The Periodic Table of Elements?
Antara berikut, yang manakah menunjukkan kumpulan yang betul bagi unsur-unsur itu dalam Jadual Berkala Unsur?

	X	**Y**	**Z**
A	2	15	13
B	2	13	15
C	13	15	2
D	15	2	13

42 Diagram 42 shows the set-up of apparatus to electroplate an iron spoon.
Rajah 42 *menunjukkan susunan radas untuk menyadur sudu besi.*



Diagram/ *Rajah* 42

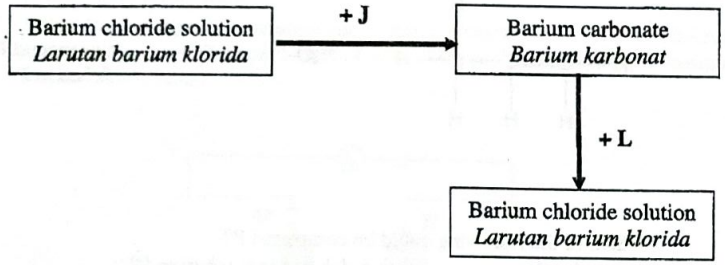
After 30 minutes, no change was observed on the iron spoon.
What should be done to get the shiny grey layer on the iron spoon?
Selepas 30 *minit, tiada perubahan diperhatikan pada sudu besi.*
Apakah yang perlu dilakukan untuk mendapat lapisan kelabu berkilat pada sudu besi itu?

A Increase the number of the dry cell
Menambah bilangan sel kering
B Clean the iron spoon with sand paper
Bersihkan sudu besi itu dengan kertas pasir
C Interchange the terminal of the dry cell
Saling tukar terminal bagi sel kering
D Replace the electrolyte with iron(II) nitrate solution
Gantikan elektrolit dengan larutan ferum(II) *nitrat*

43 What is the oxidation number of nitrogen in nitrate ion?
Apakah nombor pengoksidaan nitrogen dalam ion nitrat?

A -1
B -3
C +4
D +5

44 Diagram 44 shows a flow chart for the changes of a few type of salts.
Rajah 44 menunjukkan satu carta alir bagi penukaran beberapa jenis garam.



Diagram/ *Rajah* 44

What are solution J and solution L?
Apakah larutan J *dan larutan* L?

	J	L
A	K_2CO_3	NaCl
B	Na_2CO_3	NaCl
C	$(NH_4)_2CO_3$	HCl
D	$ZnCO_3$	HCl

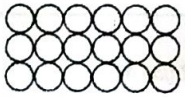
45 A standard solution is prepared by using dilution method.
What is the volume of distilled water needed to be added to 40.0 cm^3 of 1.0 mol dm^{-3} sodium hydroxide solution to produce a solution with the concentration of 0.25 mol dm^{-3}?
Satu larutan piawai disediakan dengan menggunakan kaedah pencairan.
Berapakah isi padu air suling yang perlu ditambah kepada 40.0 cm^3 *larutan natrium hidroksida* 1.0 mol dm^{-3} *untuk menghasilkan larutan natrium hidroksida dengan kepekatan* 0.25 mol dm^{-3}?

A 40.0 cm^3
B 120.0 cm^3
C 160.0 cm^3
D 200.0 cm^3

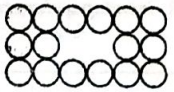
46 Diagram 46 shows a musical instrument made of substance Z.
Rajah 46 menunjukkan satu alat muzik yang diperbuat daripada bahan Z.

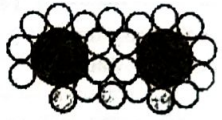
Diagram/ *Rajah* 46

Which of the following shows the arrangement of atoms in substance Z?
Antara berikut yang manakah menunjukkan susunan atom dalam bahan Z?

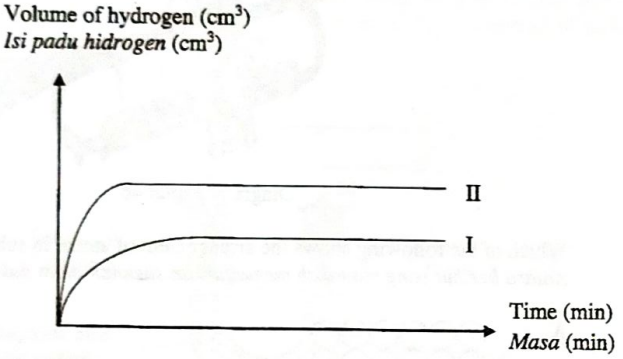
A 

B 

C 

D 

47 Diagram 47 shows a graph of volume of hydrogen gas released against time for the reaction between zinc and hydrochloric acid in two sets of experiments.
Rajah 47 menunjukkan graf isi padu gas hidrogen melawan masa bagi tindak balas antara zink dan asid hidroklorik dalam dua set eksperimen.

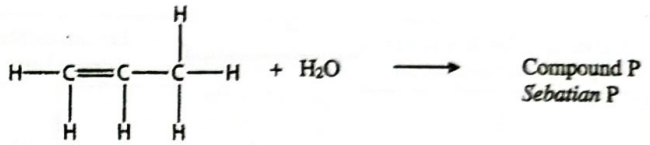


Diagram/ *Rajah* 47

In experiment I, 50 cm^3 of 0.2 mol dm^{-3} of hydrochloric acid is heated at 30.0°C and excess zinc granules is added to it.
What are the conditions needed to obtain the curve as shown in experiment II?
Dalam eksperimen I, 50 cm^3 *asid hidroklorik* 2.0 mol dm^{-3} *dipanaskan pada* 30.0°C *dan ketulan zink berlebihan ditambahkan kepadanya.*
Apakah keadaan yang diperlukan untuk mendapat lengkung seperti yang ditunjukkan dalam eksperimen II?

	Hydrochloric acid *Asid hidroklorik*		**Temperature (°C)** *Suhu* (°C)
	Volume (cm^3) *Isi padu* (cm^3)	**Concentration (mol dm^{-3})** *Kepekatan* (mol dm^{-3})	
A	25	0.4	30.0
B	25	0.4	60.0
C	50	0.2	60.0
D	50	0.3	60.0

48 The following equation represents a reaction of a compound.
Persamaan berikut mewakili tindak balas bagi satu sebatian.

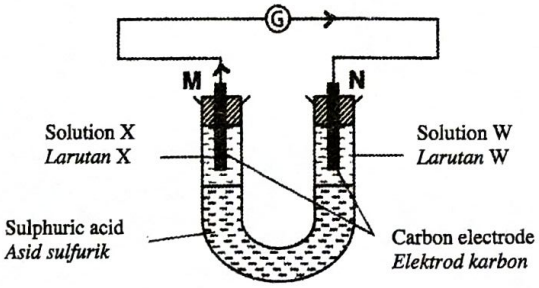


Which of the following could be compound P?
Antara berikut yang manakah boleh menjadi sebatian P?

I Propane
Propana
II Propan-1-ol
Propan-1-ol
III Propan-2-ol
Propan-2-ol
IV Propan-1,2-diol
Propan-1,2-diol

A I and III
I *dan* III
B I and IV
I *dan* IV
C II and III
II *dan* III
D II and IV
II *dan* IV

49 Diagram 49 shows the set-up of apparatus to investigate the transfer of electrons at a distance. Electrons move from electrode M to electrode N through connecting wire.
Rajah 49 menunjukkan susunan radas untuk mengkaji pemindahan elektron pada satu jarak. Elektron bergerak dari elektrod M *ke elektrod* N *melalui wayar penyambung.*

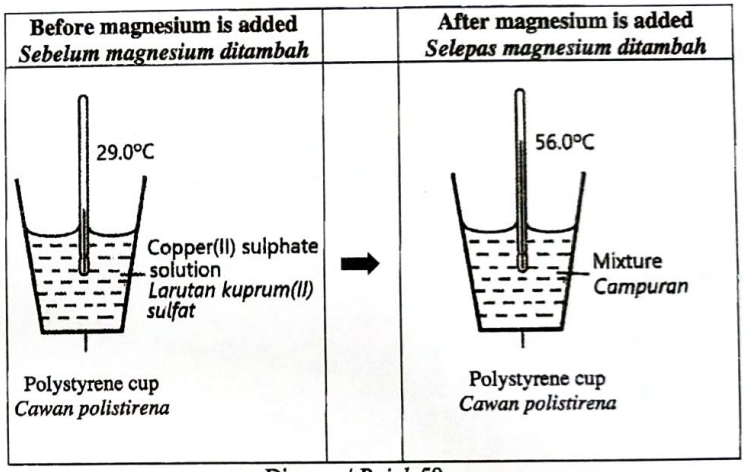


Diagram/ *Rajah* 49

What are X and W?
Apakah X *dan* W?

	X	W
A	Potassium iodide *Kalium iodida*	Iron(III) sulphate *Ferum*(III) *sulfat*
B	Bromine water *Air bromin*	Iron(II) sulphate *Ferum*(II) *sulfat*
C	Iron(II) sulphate *Ferum*(II) *sulfat*	Potassium iodide *Kalium iodida*
D	Bromine water *Air bromin*	Iron(III) sulphate *Ferum*(III) *sulfat*

50 An experiment was conducted to determine the heat of displacement of copper by magnesium. 50 cm^3 of 0.5 mol dm^{-3} copper(II) sulphate solution was measured and poured into a polystyrene cup. Excess magnesium powder was added into the polystyrene cup and the mixture is stirred.
Diagram 50 shows the thermometer readings recorded during the experiment.
Satu eksperimen telah dijalankan untuk menentukan haba penyesaran kuprum oleh magnesium. 50 cm^3 *larutan kuprum*(II) *sulfat* 0.5 mol dm^{-3} *disukat dan dituang ke dalam cawan polistirena. Serbuk magnesium berlebihan ditambah ke dalam cawan polistirena itu dan campuran dikacau.*
Rajah 50 *menunjukkan bacaan termometer yang direkodkan semasa eksperimen itu.*



Diagram/ *Rajah* 50

What is the heat of displacement of copper by magnesium?
[Specific heat capacity of solution = 4.2 J g^{-1} $°C^{-1}$;
Density of solution = 1.0 g cm^{-3}]
Berapakah haba penyesaran kuprum oleh magnesium?
[*Muatan haba tentu larutan* = 4.2 J g^{-1} $°C^{-1}$;
Ketumpatan larutan = 1.0 g cm^{-3}]

A -113.4 kJ mol^{-1}
B -226.8 kJ mol^{-1}
C -243.6 kJ mol^{-1}
D -453.6 kJ mol^{-1}

END OF QUESTION PAPER
KERTAS SOALAN TAMAT