4541/1
KIMIA
KERTAS 1
NOVEMBER 2021
1 ¼ JAM

NO KAD PENGENALAN

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Nama Pelajar :.....

Tingkatan :.....

MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)

(CAWANGAN KELANTAN)

PERCUBAAN SPM

TINGKATAN 5

2021

KIMIA

KERTAS 1

MASA : SATU JAM LIMA BELAS MINIT

1. *Kertas ini adalah dalam dwibahasa***.**
2. *Jawab semua soalan***.**
3. *Calon dikehendaki membaca maklumat di halaman 2*.

Kertas soalan ini mengandungi **33** halaman bercetak

UNTUK CALON

1. Kertas soalan ini mengandungi 40 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.

INFORMATION FOR CANDIDATES

1. *This question paper consists of 40 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.*

1 Lemak tak tepu boleh ditukarkan kepada lemak tepu melalui proses X.
Apakah X?
Unsaturated fats can be converted to saturated fats through the X *process.*
What is X*?*

A Penghidrogenan
Hydrogenation

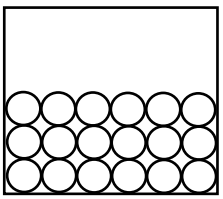
B Penghalogenan
Halogenation

C Pendehidratan
Dehydration

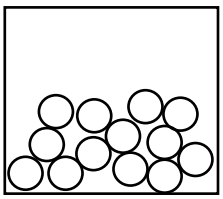
D Penggantian
Substituition

2 Manakah rajah yang menunjukkan molekul gas hidrogen.
Which diagram represent the molecules of hydrogen gas

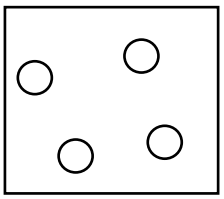
A



B



C



3 Siapakah ahli sains yang telah menyusun unsur-unsur berdasarkan Hukum Oktaf.
Who is the scientist who has compiled the elements based on the Octave Law.

A Joseph John Thomson
B James Chadwick
C John W Dobereiner
D John Newlands

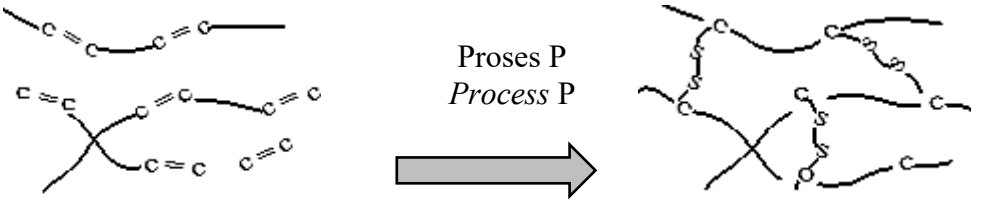
4 Antara berikut, yang manakah berlaku dalam tindak balas pengoksidaan?
Which of the following occurs in oxidation reaction

A Kehilangan oksigen
Loss of oxygen
B Penerimaan elektron
Gain of *electron*
C Penerimaan hidrogen
Gain of hydrogen
D Penambahan nombor pengoksidaan
Increase in oxidation number

5 Antara formula kimia berikut, yang manakah betul?
Which of the following chemical formulae is correct?

A Li_2O
B KBr_2
C Al_3Cl
D $MgNO_3$

6 Rajah 1 menunjukkan penukaran getah Q kepada getah R melalui Proses P
Diagram 1 *shows the conversion of rubber* Q *to rubber* R *through Process* P



Getah Q
Rubber Q

Getah R
Rubber R

Rajah 1
Diagram 1

Antara berikut, yang manakah menerangkan tujuan Proses P?
Which of the following explains the purpose of Process P*?*

A Mengurangkan kekenyalan getah
To reduce the elasticity of rubber

B Meningkatkan takat lebur getah
To increase the melting point of rubber

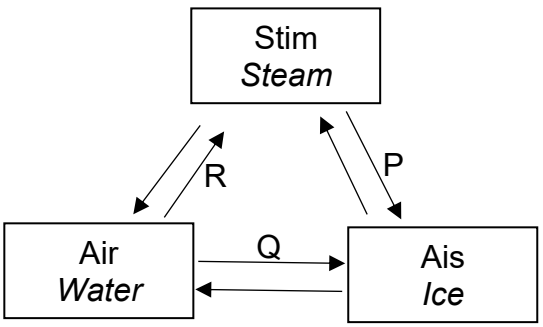
C Mengurangkan saiz molekul getah
To decrease the size of rubber molecules

D Meningkatkan pengoksidaan getah
To increase the oxidation of rubber

7 Antara zarah-zarah dalam larutan ammonia, apakah zarah yang menyebabkan larutan ammonia bersifat alkali?
Among the particles in ammonia solution, what are the particles that cause the ammonia solution to be alkaline?

A NH_3
B NH_4^+
C OH^-

8 Rajah 2 menunjukkan perubahan keadaan jirim bagi suatu bahan.
Diagram 2 shows the inter-conversion of the states of matter of a substance.



Rajah 2
Diagram 2

Proses manakah yang melibatkan penyerapan tenaga haba?
Which process involves the absorption of heat energy?

A P
B Q
C R

9 Antara pernyataan berikut yang manakah benar bagi unsur kala 3 dari kiri ke kanan dalam Jadual Berkala Unsur?
Which of the following statement is true about elements in period 3 *from left to right in Periodic Table of Elements*

A Sifat kelogaman unsur bertambah
Metallic properties of elements increase

B Bilangan elektron valens berkurang
Electron valence decrease

C Keelektronegatifan unsur berkurang
Electronegativity of the elements decrease

D Saiz atom berkurang kerana bilangan proton bertambah
Atomic size decrease because of the proton number increase

10 Antara berikut yang manakah merupakan tindak balas redoks?
Which of the following is a redox reaction?

A Menyalakan dapur gas
Igniting the gas stove

B Tindak balas asid ke atas lateks
A reaction of acid on latex

C Menggunakan pek sejuk untuk meredakan sakit kaki
Using cold pack to relieve muscle pain

D Mencuci kotoran yang terkena kotoran berminyak dengan sabun
Washing oil-stained clothes using soap

11 Rajah 3 menunjukkan peralatan pembedahan iaitu sejenis aloi yang mengandungi ferum sebagai komponen utama

Diagram 3 *shows a surgical equipments which is an alloy contain iron as the main component.*

Rajah 3

Diagram 3

Manakah antara berikut merupakan atom-atom asing aloi tersebut?

Which of the following are foreign atoms of the alloy?

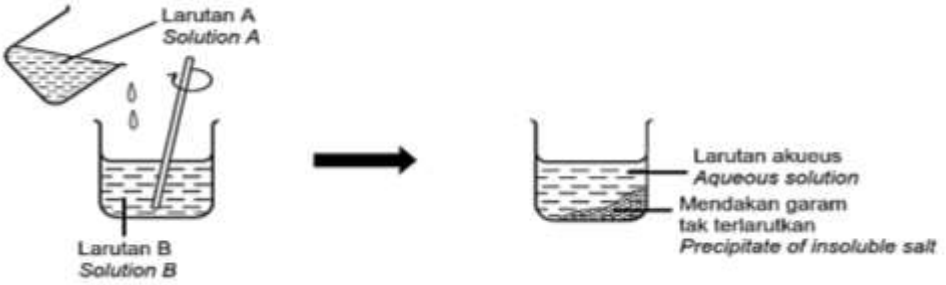
A Mangan dan zink
Manganese and zinc

B Aluminium dan magnesium
Aluminium and magnesium

C Kromium dan nikel
Chromium and nickel

D Kuprum dan antimoni
Copper and antimony

12 Garam tak terlarutkan disediakan dengan mencampur dua larutan akueus menerusi tindak balas penguraian ganda dua.
Rajah 4 menunjukkan bagaimana garam tak terlarutkan dihasilkan di dalam makmal.
Insoluble salts are prepared by mixing two aqueous solutions through the double decomposition reaction.
Diagram 4 shows how insoluble salts are produced in the laboratory.



Rajah 4
Diagram 4

Pilih dua bahan yang boleh menghasilkan garam tak terlarutkan menerusi kaedah yang sama.
Choose two substances that can produce insoluble salt by the same method

	Larutan A *Solution* A	Larutan B *Solution* B
A	Plumbum(II) oksida *Lead(II) oxide*	Asid sulfurik *Sulphuric acid*
B	Barium nitrat *Barium nitrate*	Natrium sulfat *Sodium sulphate*
C	Kalsium klorida *Calcium chloride*	Magnesium nitrat *Magnesium nitrate*
D	Magnesium hidroksida *Magnesium hidroxide*	Kalsium nitrat *Calcium nitrate*

13 Rajah 5 menunjukkan proses penyediaan detergen melalui beberapa peringkat
Diagram 5 *shows the preparation of detergent through several steps*

Peringkat 1 : Pensulfonan
Step 1 : Sulphonation

Rantai Panjang alkohol + Bahan P → Asid alkil sulfonik + Air
Long-chain alcohol + Substance P→ Alkyl sulphonic acid + Water

Peringkat 2 : Peneutralan
Step 2 : Neutralisation

Asid alkil sulfonic + Bahan Q → Natrium alkil sulfat + Air
Alkyl sulphonic acid + Substance Q → Sodium alkyl sulphate + Water

Rajah 5
Diagram 5

Apakah bahan P dan Q?
What is substances P *and* Q*?*

	Bahan P ***Substance P***	**Bahan Q** ***Substance Q***
A	Asid sulfurik *Sulphuric acid*	Larutan natrium hidroksida *Sodium hydroxide solution*
B	Asid palmitik *Palmitic acid*	Larutan natrium klorida *Sodium chloride solution*
C	Asid hidroklorik *Hidrocloric acid*	Larutan natrium hidroksida *Sodium chloride solution*
D	Asid nitrik *Nitric acid*	Larutan natrium klorida *Sodium hydroxide solution*

14 Tentukan nilai pH larutan barium hidroksida, $Ba(OH)_2$ yang berkepekatan 0.05 mol dm^{-3}.
Determine the pH value of a solution of barium hydroxide, $Ba(OH)_2$ *at a concentration of* 0.05 mol dm^{-3}.

A 1.3
B 12.7
C 13.0
D 14.0

15 Jadual 1 menunjukkan maklumat tentang isotop dalam sampel bagi rubidium.
Table 1 shows information about the isotopes in a sample of rubidium.

Isotop *Isotope*	Bilangan proton *Number of protons*	Bilangan neutron *Number of neutrons*	Peratus isotop dalam sampel *Percentage of isotope in sample*
1	37	48	72
2	37	50	28

Jadual 1
Table 1

Hitung jisim atom relatif bagi sampel rubidium ini.
Calculate the relative atomic mass of this sample of rubidium.

A 34.84
B 48.60
C 85.56
D 86.00

16 Unsur P dan unsur Q bertindak balas untuk membentuk satu sebatian kovalen dengan formula PQ_2.
Antara berikut yang manakah benar?
Element P *and* Q *react to form a covalent compound with formula* PQ_2.
Which of the following is true?

	Susunan elektron atom P *Electron arrangement of atom* P	Susunan elektron atom Q *Electron arrangement of atom* Q
A	2.8.2	2.8.7
B	2.4	2.6
C	2.5	2.7
D	2.1	2.7

17 Persamaan ion berikut menunjukkan tindak balas antara zinc dengan asid
$Zn_{(p)} + 2H^+_{(ak)} \rightarrow Zn^{2+}_{(ak)} + H_{2\ (g)}$

The following ionic equation shows the reaction between zinc and acid
$Zn_{(s)} + 2H^+_{(aq)} \rightarrow Zn^{2+}_{(aq)} + H_{2\ (g)}$

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

A 0 kepada +1
0 *to* +1

B 0 kepada +2
0 *to* +2

C +1 kepada 0
+1 *to* 0

D +1 kepada +2
+1 *to* +2

18 Jadual 2 menunjukkan isipadu gas karbon dioksida terkumpul dalam satu eksperimen

Table 2 shows the volume of carbon dioxide gas collected in an experiment

Masa (s) *Time* (s)	0	30	60	90	120	150	180	210	240
Isipadu CO_2 (cm^3) *Volume of* CO_2 (cm^3)	0	20.0	30.0	31.0	32.0	32.5	33.0	33.0	33.0

Jadual 2

Table 2

Berapakah kadar tindak balas purata?

What is the everage rate of reaction?

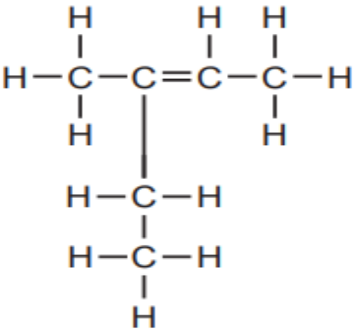
A 0.14 cm^3s^{-1}

B 0.18 cm^3s^{-1}

C 0.22 cm^3s^{-1}

D 0.37 cm^3s^{-1}

19 Rajah 6 menunjukkan formula struktur bagi satu isomer alkena.
Diagram 6 shows the structural formula of an isomer for an alkene.



Rajah 6
Diagram 6

Namakan isomer itu berdasarkan sistem penamaan IUPAC.
Name the isomer according to the IUPAC nomenclature system.

A 2-metilbut-2-ena
2-methylbut-2-ene

B 3-metilpent-2-ena
3-methylpent-2-ene

C 3-metilpent-3-ena
3-methylpent-3-ene

D 2,2-dimetilbut-2-ena
2,2-dimethylbut-2-ene

20 Jadual 3 menunjukkan takat lebur dan takat didih bagi empat bahan.

Table 3 *shows the melting point and boiling point of four substances.*

Bahan *Substance*	Takat lebur (°C) *Melting point* (°C)	Takat didih (°C) *Boiling point* (°C)
P	-17	58
Q	85	192
R	-120	-10
S	258	302

Jadual 3

Table 3

Bahan manakah ialah cecair pada suhu bilik?

Which substance is a liquid at room temperature?

A P

B Q

C R

D S

21 Suatu tindak balas redoks boleh diwakili oleh persamaan berikut

$X_{2\ (ak)} + 2KBr_{\ (ak)} \rightarrow 2KX_{\ (ak)} + Br_{2\ (ak)}$

A redox reaction can be represented by the following equation

$X_{2\ (aq)} + 2KBr_{\ (aq)} \rightarrow 2KX_{\ (aq)} + Br_{2\ (aq)}$

Unsur X berada di dalam Kumpulan 17 Jadual Berkala Unsur.
Apakah yang diperhatikan jika unsur X digantikan dengan iodin?
Element X *is in Group 17 in the Periodic Table of Elements*.
What can be observed if element X *is replaced with iodine*?

A Larutan tak berwarna terhasil
Colourless solution is produced

B Gas perang terhasil
Brown gas is produced

C Warna perang larutan iodin dinyahwarnakan
Brown colour of the iodine is decolourised

D Tiada perubahan dapat diperhatikan
No change is observed

22 Etena dapat dibezakan daripada etana kerana etena dapat
Ethene can be differentiate from ethane because ethene can

	Etena *Ethene*	Etana *Ethane*
A	Larut dalam air *Soluble in water*	Tidak larut dalam air *Insoluble in water*
B	Tidak terbakar dalam udara *Does not burn in the air*	Terbakar dalam udara *burning in the air*
C	Bertindak balas dengan alkohol *React with alcohol to produce ester*	Tidak bertindak balas dengan alkohol *Does not react with alcohol to produce ester*
D	Melunturkan warna perang air bromin *Bleaching the brown colour of bromine water*	Warna perang air bromin tidak dilunturkan *The brown color of bromine water is not bleached*

23 Proses yang manakah mempunyai kadar tindak balas yang paling tinggi?
Which process has the highest rate of reaction?

A Fotosintesis
Photosynthesis

B Pembakaran
Combustion

C Respirasi
Respiration

D Pengaratan
Rusting

24 Apakah mendakan kuning yang terbentuk apabila larutan natrium tiosulfat, $Na_2S_2O_3$ bertindak balas dengan asid sulfurik, H_2SO_4?
What is the yellow precipitate formed when sodium thiosulphate, $Na_2S_2O_3$ *solution reacts with sulphuric acid*, H_2SO_4?

A Sulfur dioksida
Sulphur dioxide

B Sulfur trioksida
Sulphur trioxide

C Natrium sulfat
Sodium sulphate

D Sulfur
Sulphur

25 Sebatian P mempunyai ciri-ciri seperti berikut:
Compound P has the characteristics as follow:

- Sangat larut dalam air
  Very soluble in water
- Boleh disediakan daripada alkena
  Can be prepared from an alkene

Apakah kemungkinan sebatian P?
What is probably compound P?

A $C_2H_5COOCH_3$

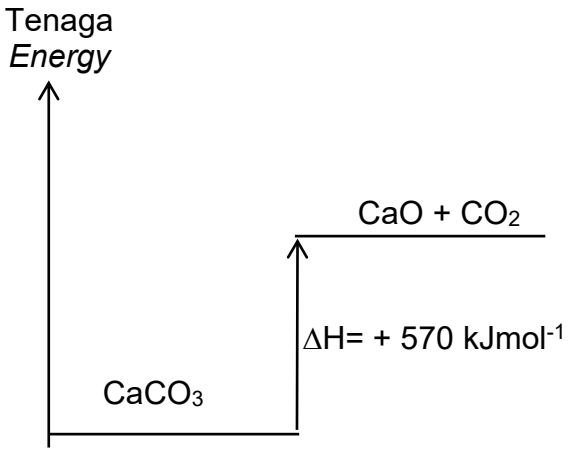
B CH_3COONa

C C_3H_7COOH

D C_2H_5OH

26 Rajah 7 menunjukkan gambar rajah aras tenaga bagi penguraian kalsium karbonat.

Diagram 7 shows an energy level diagram for the decomposition of calcium carbonate



Rajah 7

Diagram 7

Pernyataan manakah yang boleh dirumuskan daripada Rajah 7?

Which statement can be deduced from Diagram 7?

A Tindak balas itu adalah eksotermik

The reaction is exothermic

B Haba diserap dalam tindak balas itu

Heat is absorbed in the reaction

C Bahan tindak balas mempunyai lebih tenaga daripada hasil tindak balas

The reactant has more energy than the products

D Jumlah tenaga bagi bahan tindak balas dan hasil tindak balas adalah 570 kJ

Total energy of the reactant and the products is 570 kJ

27 Rajah 8 menunjukkan penyediaan larutan piawai natrium karbonat, Na_2CO_3 dengan melarutkan 10.6 g natrium karbonat di dalam air suling dan menjadikan isi padu sehingga 100 cm^3.

Diagram 8 *shows the preparation of standard solution of sodium carbonate,* Na_2CO_3 *by dissolving* 10.6 g *of sodium carbonate in distilled water and making the volume up to* 100 cm^3*.*

Rajah 8

Diagram 8

Berapakah isipadu larutan piawai yang disediakan perlu digunakan jika seorang pelajar ingin menyediakan 50 cm^3 larutan natrium karbonat 0.5 mol dm^{-3}?

[Jisim formula relatif : Na_2CO_3 = 106]

What is the volume of standard solution prepared that should be used if a student wants to prepare 50 cm^3 *of* 0.5 mol dm^{-3} *sodium carbonate solution?*

[Relative formula mass : Na_2CO_3 = 106*]*

A 10.0 cm^3

B 12.5 cm^3

C 25.0 cm^3

D 50.0 cm^3

28 Sebuah katrij penunu Bunsen mengandungi 2.75 kg gas butana, C_4H_{10}.
Berapakah bilangan mol gas itu?
[Jisim atom relatif: H = 1, C = 12]

A Bunsen burner cartridge contains 2.75 kg *butane gas,* C_4H_{10}.
What is the number of moles of the gas?
[Relative atomic mass : H = 1, C = 12*]*

A 23.71
B 24.55
C 47.41
D 49.11

29 Rajah 9 menunjukan pembentukan bahan komposit daripada komponen asalnya

Diagram 9 shows the formation of a composite material from its original components

Rajah 9

Diagram 9

Berdasarkan Rajah 9, mengapakah konkrit yang diperkukuhkan digunakan untuk membina bangunan dan jambatan berbanding konkrit?

Based on Diagram 9, why reinforced concrete is used to build buildings and bridges compared to concrete?

A lebih keras daripada konkrit
harder than concrete

B mempunyai ketahanan mampatan yang lebih tinggi
has higher compressive resistance

C mempunyai ketahanan regangan yang lebih tinggi
has higher tensile resistance

D hanya dapat dibentuk kepada bentuk yang terhad
can only be formed to a limited form

30 Pembakaran lengkap bagi satu hidrokarbon diwakili oleh persamaan yang berikut:
The complete combustion of a hydrocarbon is represented by the following equation:

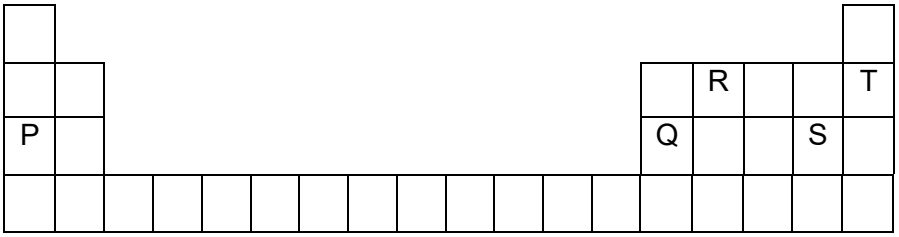
$$CH_{2x} + xO_2 \rightarrow CO_2 + xH_2O$$

Apakah nilai x?
What is the value of x?

A 5
B 4
C 3
D 2

31 Rajah 10 menunjukkan Jadual Berkala Unsur yang terdiri daripada unsur P,Q, R, S dan T

Diagram 10 *shows the Periodic Table of Elements consisting of the elements* P, Q, R, S *and* T



Rajah 10

Diagram 10

Susun unsur P,Q, R, S dan T berdasarkan pertambahan saiz jejari atom.

Arrange the elements P, Q, R, S *and* T *based on the increase in atomic radius size.*

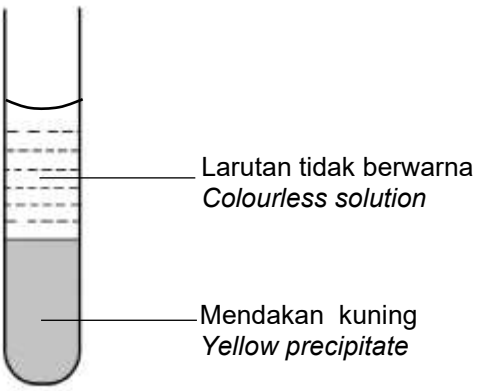
A T, R, S, Q, P

B P, R, T, Q, S

C R, T, P. Q, S

D P, Q, R, S, T

32 Rajah 11 menunjukkan tindak balas antara 8.0 cm^3 larutan plumbum(II) nitrat, 1.0 mol dm^{-3} dengan larutan 5.0 cm^3 larutan kalium kromat(VI), 1.0 mol dm^{-3}.
Diagram 11 *shows the reaction between* 8.0 cm^3 *solution of lead(II) nitrate,* 1.0 mol dm^{-3} *and* 5.0 cm^3 *solution of potassium chromate(VI),* 1.0 mol dm^{-3}.



Rajah 11
Diagram 11

Apakah ion-ion yang hadir dalam larutan tidak berwarna di atas mendakan.
What are the ions present in the colourless solution above the precipitate.

A K^+, NO_3^-, Pb^{2+}
B K^+, NO_3^-, CrO_4^{2-}
C Pb^{2+}, NO_3^-
D K^+, NO_3^-

33 Jadual 4 menunjukkan haba peneutralan bagi dua asid monoprotik yang berlainan, P dan Q dengan larutan kalium hidroksida.

Table 4 *shows the heat of neutralisation of two different monoprotic acids,* P *and* Q, *with potassium hydroxide solution.*

Set	Jenis asid *Type of asid*	Jenis alkali *Type of alkali*	Haba peneutralan *Heat of neutralisation*
I	50 cm^3 1.0 mol dm^{-3} asid monoprotik P. 50 cm^3 *of* 1.0 mol dm^{-3} *monoprotic acid* P.	50 cm^3 larutan kalium hidroksida 1.0 mol dm^{-3} 50 cm^3 *of* 1.0 mol dm^{-3} *potassium hydroxide solution*	– 57.0 kJ mol^{-1}
II	50 cm^3 1.0 mol dm^{-3} asid monoprotic Q. 50 cm^3 *of* 1.0 mol dm^{-3} *monoprotic acid* Q.	50 cm^3 larutan kalium hidroksida, 1.0 mol dm^{-3} 50 cm^3 *of* 1.0 mol dm^{-3} *potassium hydroxide solution*	– 54.0 kJ mol^{-1}

Jadual 4
Table 4

Berdasarkan maklumat dalam Jadual 4, apakah P dan Q?
Based on the information in Table 4*, what is* P *and* Q ?

	Set I	Set II
A	Asid nitrik *Nitric acid*	Asid sulfurik *Sulphuric acid*
B	Asid etanoik *Ethanoic acid*	Asid fosforik *Phosphoric acid*
C	Asid nitrik *Nitric acid*	Asid etanoik *Ethanoic acid*
D	Asid hidroklorik *Hydrochloric acid*	Asid nitrik *Nitric acid*

34 Rajah 12 menunjukkan cakera brek dan cakera pemotong yang dibuat dari seramik termaju.
Bahan X digunakan dalam pembuatan cakera brek dan cakera pemotong, kerana sifatnya yang kuat, keras, tahan kejutan terma dan rintangan yang tinggi terhadap haba.

Diagram 12 shows a brake disc and a cutting disc made of advanced ceramic. Material X is used in the manufacture of brake discs and cutting discs , due to its strong, hard, thermal shock resistance and high resistance to heat.

Rajah 12
Diagram 12

Apakah X?
What is X?

A Silika
Silica
B Alumina
Alumina
C Silikon karbida
Silicon carbide
D Zirkonium oksida
Zircornium oxide

35 Selain daripada membunuh bakteria di permukaan kulit, penggunaan cecair antiseptik disinfektan juga dapat memusnahkan patogen yang terdapat pada lantai dan sistem perparitan.
Diantara berikut, yang manakah disinfektan?

In addition to killing bacteria on the surface of the skin, the use of disinfectant antiseptic liquids can also destroy pathogens found on floors and drainage systems.
Which of the following is a disinfectant?

A Antihistamin
Antihistamines

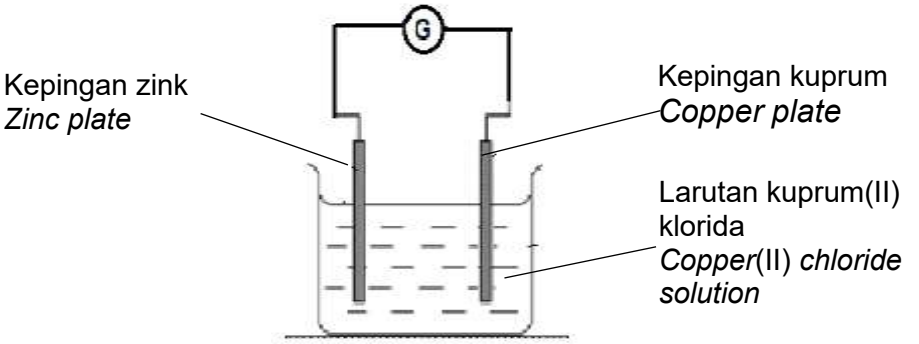
B Klozapin
Klozapin

C Etanol
Ethanol

D Betametason
Betamethasone

36 Rajah 13 menunjukkan satu sel kimia

Diagram 13 *shows a chemical cell*



Rajah 13

Diagram 13

Bahan manakah yang mengalami pengoksidaan dan penurunan?

Which subtances undergo oxidation and reduction?

[E^0 bagi sel setengah ; $Zn^{2+}_{(ak)} + 2e \rightleftharpoons Zn_{(p)}$, $E^0 = - 0.76V$]

[E^0 bagi sel setengah : $Cu^{2+}_{(ak)} + 2e \rightleftharpoons Cu_{(p)}$, $E^0 = + 0.34V$]

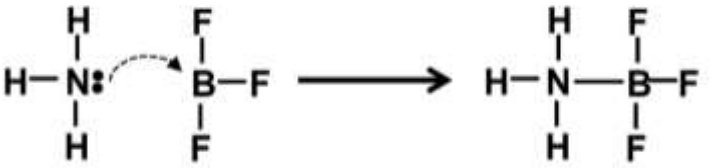
	Pengoksidaan *Oxidation*	Penurunan *Reduction*
A	Kuprum *Copper*	Ion Kuprum(II) *Copper*(II) *ion*
B	Kuprum *Copper*	Ion hidrogen *Hydrogen ion*
C	Zink *Zinc*	Ion Kuprum(II) *Copper*(II) *ion*
D	Zink *Zinc*	Ion hidrogen *Hydrogen ion*

37 Dalam suatu tindak balas, 4.6 g natrium telah ditindak balaskan dengan gas oksigen dalam sebuah balang gas. Hasil tindak balas ialah pepejal putih. Sebahagian pepejal ini telah dilarutkan ke dalam 25 cm^3 air suling membentuk larutan tidak berwarna, berkepekatan 2 mol dm^{-3} yang menukarkan warna kertas litmus merah kepada biru.
Berapakah jisim pepejal putih yang telah bertindak balas dengan air suling untuk menghasilkan larutan tidak berwarna tersebut.
[Jisim atom relatif : Na = 23, O = 16]

In a reaction, 4.6 g *of sodium is reacted with oxygen gas in a gas jar. The result of the reaction is a white solid. Some of the solid is dissolved in* 25 cm^3 *of distilled water to form a colourless solution and the concentration is* 2 mol dm^{-3}*. The solution changed the colour of litmus paper from red to blue.*
What is the mass of white solid that has reacted with the distilled water to produce the colourless solution.
[Relative atomic mass: Na = *23,* O = *16]*

A 2.3 g
B 3.1 g
C 6.2 g
D 6.6 g

38 Rajah 14 menunjukkan pembentukkan ammonia boron trifluorida apabila ammonia NH_3 bertindak balas dengan boron trifluoride BF_3.
Diagram 14 *shows the formation of ammonia boron trifluoride when ammonia* NH_3 *reacts with boron trifluoride* BF_3



Rajah 14
Diagram 14

Apakah ikatan kimia yang ditunjukkan dalam Rajah 14?
What is the chemical bond shown in Diagram 14?

A Ikatan ion
Ionic bond

B Ikatan datif
Dative bond

C Ikatan logam
Metallic bond

D Ikatan hidrogen
Hydrogen bond

39 Antara berikut yang manakah contoh polimer Elastomer
Which of the following is an example of an Elastomer polymer

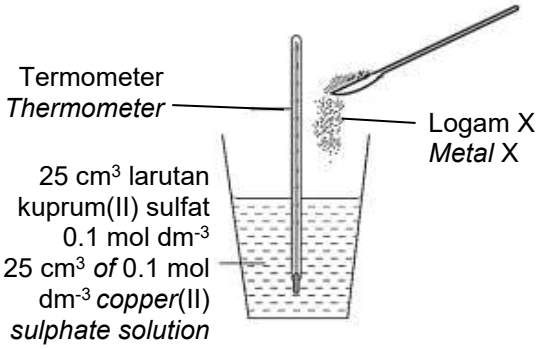
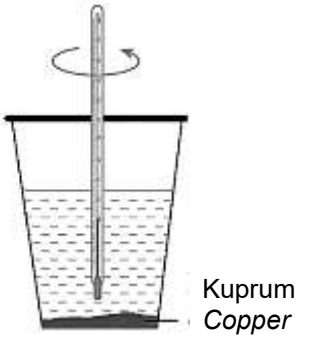
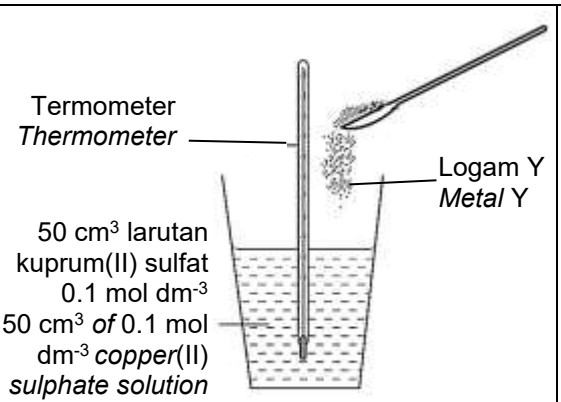
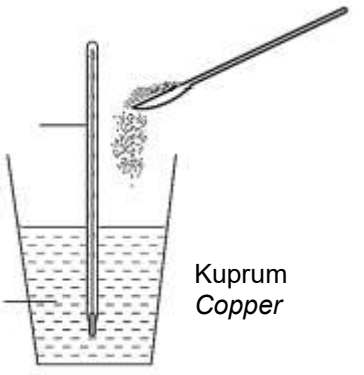
A Bakelit
Bakelite

B Melamina
Melamine

C Polivinil klorida
Polyvinyl chloride

D Getah stirena-butadiena (SBR)
Styrene-butadiene rubber (SBR)

40 Rajah 15 menunjukkan dua set eksperimen yang dijalankan ke atas 25 cm^3 larutan kuprum(II) sulfat. Serbuk logam magnesium dimasukkan secara berlebihan.
Diagram 15 *shows two sets of experiment conducted on 25* cm^3 *of* 0.1 mol dm^{-3} *copper*(II) *sulphate solution. Magnesium powders are added in excess.*

Set	Sebelum *Before*	Selepas *After*
I		
	Suhu awal = 28.0 °C *Initial temperature* = 28.0 °C	Suhu tertinggi = 33.0 °C *Highest temperature* = 33.0 °C
	Haba penyesaran, ΔH = -42.0 kJ mol^{-1} *Heat of displacement*, ΔH = -42.0 kJ mol^{-1}	
II		
	Suhu awal = 28.0 °C *Initial temperature* = 28.0 °C	Suhu tertinggi = 39.0 °C *Highest temperature* = 39.0 °C
	Haba penyesaran, ΔH = -92.4 kJ mol^{-1} *Heat of displacement*, ΔH = -92.4 kJ mol^{-1}	

Rajah 15

Diagram 15

Antara yang berikut yang manakah menerangkan tentang kedua-dua set eksperimen tersebut dengan betul?
Which of the following are the statements that describe the two sets of the experiment correctly?

I Jumlah kandungan tenaga hasil tindak lebih tinggi daripada jumlah kandungan tenaga bahan tindak balas bagi kedua-dua set eksperimen.
Total energy content of the products is more than the total energy of the reactants for both sets of the experiment.

II Kedua-dua set eksperimen menyerap haba dari persekitaran
Both of the sets of experiment are absorb heat from the surrounding.

III Perubahan haba tindak balas dalam Set II lebih tinggi berbanding Set I
Heat change in the reaction in Set II *is higher than Set* I.

IV Y lebih elektropositif daripada X.
Y *more electropositive than* X

A I dan II
I *and* II

B I dan III
I *and* III

C II dan IV
II *and* IV

D III dan IV
III *and* IV

END OF QUESTION PAPER
KERTAS SOALAN TAMAT