This question paper consists of **50** questions. Answer **all** questions.
Kertas peperiksaan ini mengandungi **50** *soalan. Jawab* **semua** *soalan.*

1 Which of the following is the special characteristic of transition metals?
Antara yang berikut, yang manakah ciri istimewa bagi logam peralihan?

A Soft solid
Pepejal lembut

B Soluble in water
Larut dalam air

C Low melting point
Takat lebur rendah

D Form coloured ions
Membentuk ion berwarna

2 The information below is about an alloy B.
Maklumat di bawah adalah tentang suatu aloi B.

Alloy *Aloi*	**Main component** *Komponen utama*	**Use** *Kegunaan*
B	Iron *Ferum*	Surgical instruments *Alatan pembedahan* Cutlery *Kutleri*

Based on the information, what is B?
Berdasarkan maklumat tersebut, apakah B?

A Pewter *Piuter*
B Brass *Loyang*
C Duralumin *Duralumin*
D Stainless steel *Keluli nirkarat*

3 Diagram 1 shows a displacement reaction.
Rajah 1 *menunjukkan satu tindak balas penyesaran.*

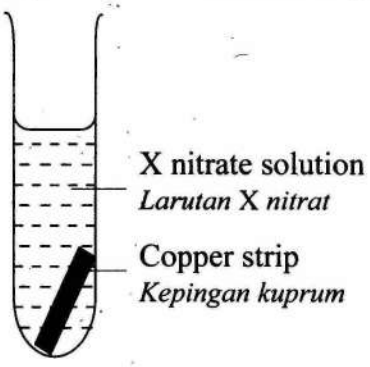


Diagram 1
Rajah 1

After a few minutes, the colourless solution turns blue.
Selepas beberapa minit, larutan tanpa warna bertukar menjadi biru.

Which statement best explains the observation?
Pernyataan manakah yang paling baik menerangkan pemerhatian tersebut?

A Copper undergoes oxidation
Kuprum mengalami pengoksidaan

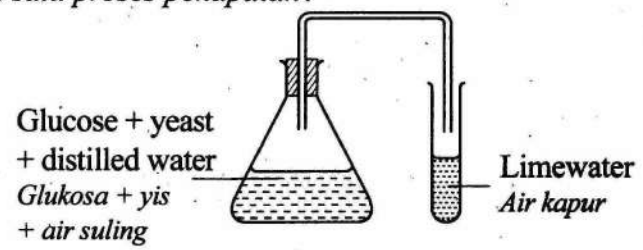
B Concentration of ion X increases
Kepekatan ion X *meningkat*

C Copper (III) ions formed
Ion kuprum (III) *terhasil*

D X loses electron
X *kehilangan elektron*

4 Which diagram shows the correct apparatus set-up for a fermentation process?
Rajah manakah menunjukkan susunan radas yang betul bagi satu proses penapaian?

A



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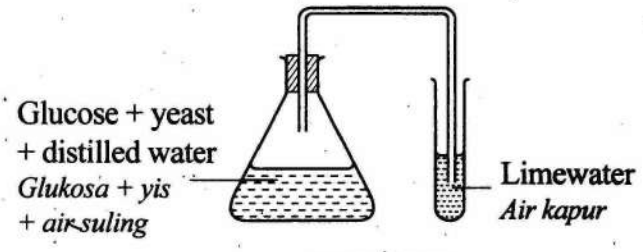

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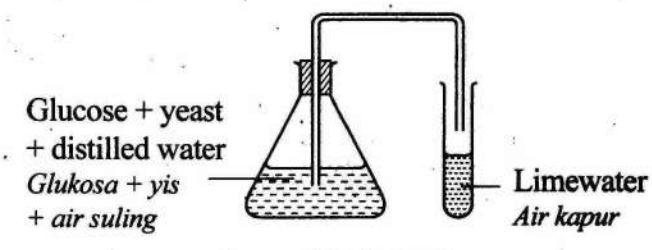
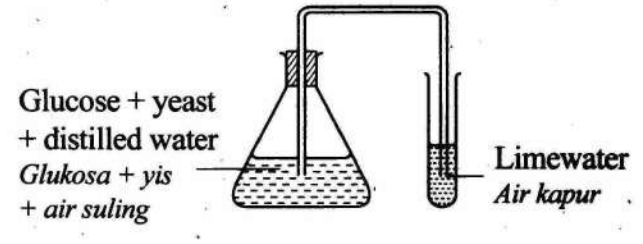


D



5 Which of the following is the property of tetrachloromethane, CCl_4?
Antara yang berikut, yang manakah sifat tetraklorometana, CCl_4?

A Non-volatile
Tidak meruap

B Insoluble in organic solvent
Tidak larut dalam pelarut organik

C Conducts electricity in any state
Mengkonduksi elektrik dalam semua keadaan

D Has low melting and boiling point
Mempunyai takat lebur dan takat didih yang rendah

6 Which substance is a reducing agent?
Bahan manakah yang merupakan satu agen penurunan?

A Acidified hydrogen peroxide solution
Larutan hidrogen peroksida berasid

B Iron (III) nitrate solution
Larutan ferum (III) *nitrat*

C Potassium iodide solution
Larutan kalium iodida

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

7 Diagram 2 shows the structural formula of ester contained in pineapple.
Rajah 2 menunjukkan formula struktur ester yang terkandung dalam nanas.

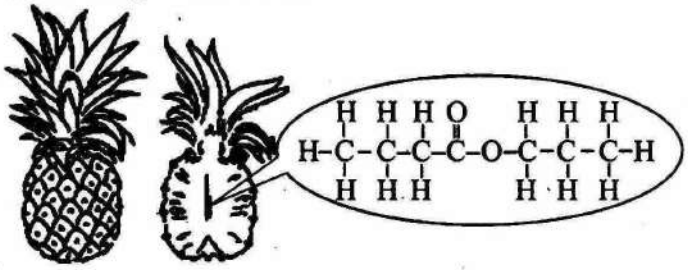


Diagram 2
Rajah 2

What is the name of the ester based on IUPAC system nomenclature?
Apakah nama ester tersebut mengikut sistem penamaan IUPAC?

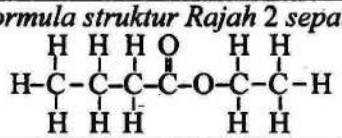
A Methyl pentanoate
Metil pentanoat

B Propyl propanoate
Propil propanoat

C Ethyl butanoate
Etil butanoat

D Butyl ethanoate
Butil etanoat

Ralat: Formula struktur Rajah 2 sepatutnya ialah:



8 Which reaction absorbs heat from the surrounding?
Tindak balas manakah yang menyerap haba dari persekitaran?

A Zinc is added into copper (II) sulphate solution
Zink ditambahkan ke dalam larutan kuprum (II) *sulfat*

B Water is added to solid sodium hydroxide
Air ditambahkan kepada pepejal natrium hidroksida

C Water is added to solid ammonium nitrate
Air ditambahkan kepada pepejal ammonium nitrat

D Zinc is added into sulphuric acid
Zink ditambahkan ke dalam asid sulfurik

9 Which observation is correct when hexene is burnt in air?
Pemerhatian manakah yang betul apabila heksena dibakar dalam udara?

A No flame
Tiada nyalaan

B Blue flame produced
Nyalaan biru terhasil

C Yellow flame and little soot produced
Nyalaan kuning dan sedikit jelaga terhasil

D Yellow flame and lots of soot produced
Nyalaan kuning dan banyak jelaga terhasil

10 Which statement is correct about the concentration of a solution in g dm^{-3}?
Pernyataan manakah yang betul tentang kepekatan suatu larutan dalam g dm^{-3}?

A The quantity of solute in a given volume of solution
Kuantiti bahan terlarut dalam suatu isi padu larutan

B The number of moles of solute in a given volume of solution
Bilangan mol bahan terlarut dalam suatu isi padu larutan

C The mass of one mole of solution in gram
Jisim bagi satu mol larutan dalam gram

D The number of solute particles that is present in one mole of solution
Bilangan zarah bahan terlarut yang hadir dalam satu mol larutan

11 Which metal can be extracted from its ores by electrolysis process?
Logam manakah yang boleh diekstrak daripada bijihnya melalui proses elektrolisis?

A Aluminium
Aluminium

B Zinc
Zink

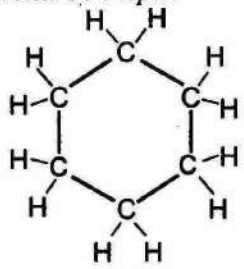
C Lead
Plumbum

D Tin
Stanum

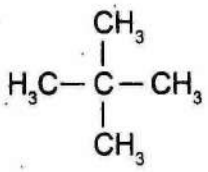
12 Which of the following are saturated hydrocarbons?

Antara yang berikut, yang manakah merupakan hidrokarbon tepu?

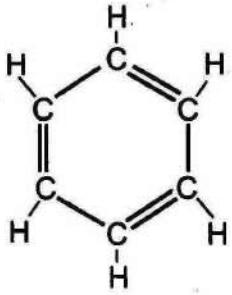
I



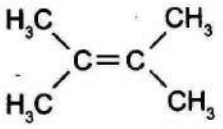
III



II



IV



A I and II
I *dan* II

B I and III
I *dan* III

C II and IV
II *dan* IV

D III and IV
III *dan* IV

13 Which of the following will produce an insoluble salt?

Antara yang berikut, yang manakah akan menghasilkan garam tak terlarutkan?

A Hydrochloric acid and sodium hydroxide
Asid hidroklorik dan natrium hidroksida

B Hydrochloric acid and copper (II) oxide
Asid hidroklorik dan kuprum (II) *oksida*

C Sulphuric acid and barium hydroxide
Asid sulfurik dan barium hidroksida

D Sulphuric acid and zinc
Asid sulfurik dan zink

14 A student used ethanol as an electrolyte in an electrolysis experiment. After two minutes, there was no deflection of the needle on the ammeter.

Seorang murid menggunakan etanol sebagai elektrolit dalam suatu eksperimen elektrolisis. Selepas dua minit, didapati tiada pesongan pada jarum ammeter.

Which explanation is the most suitable for the observation?

Penjelasan manakah yang paling sesuai bagi pemerhatian tersebut?

A Particles of ethanol move freely
Zarah etanol bergerak bebas

B Particles of ethanol lose electrons
Zarah etanol kehilangan elektron

C Particles of ethanol contain positively-charged ions
Zarah etanol mengandungi ion bercas positif

D Particles of ethanol are made up of molecule
Zarah etanol terdiri daripada molekul

15 Which of the following pair is correct about the type of medicine and its example?

Antara berikut, pasangan manakah yang betul tentang jenis ubat dan contohnya?

	Type of Medicine *Jenis Ubat*	**Example** *Contoh*
A	Stimulants *Stimulan*	Amphetamine *Amfetamin*
B	Antibiotics *Antibiotik*	Aspirin *Aspirin*
C	Analgesics *Analgesik*	Barbiturate *Barbiturat*
D	Antipsychotic *Antipsikotik*	Penicillin *Penisilin*

16 Diagram 3 shows the apparatus set-up of a reaction.

Rajah 3 menunjukkan susunan radas bagi satu tindak balas.

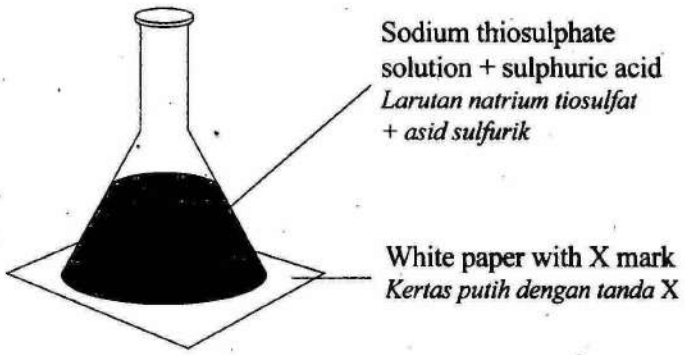


Diagram 3
Rajah 3

What is the substance that will be formed and covers the X mark?

Apakah bahan yang akan terbentuk dan menutupi tanda X?

A Na_2SO_4

B H_2S

C SO_2

D S

17 Which molecule has a double covalent bond between its atoms?

[Proton number: H = 1, N = 7, O = 8, Cl = 9]

Molekul manakah yang mempunyai ikatan kovalen ganda dua antara atomnya?

[*Proton number:* H = 1, N = 7, O = 8, Cl = 9]

A Hydrogen
Hidrogen

B Fluorine
Fluorin

C Nitrogen
Nitrogen

D Oxygen
Oksigen

18 Which industrial process uses iron as a catalyst?
Proses industri manakah yang menggunakan ferum sebagai mangkin?

A Manufacture of sulphuric acid
Pembuatan asid sulfurik

B Manufacture of margerine
Pembuatan marjerin

C Manufacture of ammonia
Pembuatan ammonia

D Manufacture of nitric acid
Pembuatan asid nitrik

19 Which of the following is a weak acid and a weak alkali?
Antara yang berikut, yang manakah asid lemah dan alkali lemah?

A Methanoic acid and ammonia solution
Asid metanoik dan larutan ammonia

B Methanoic acid and potassium hydroxide solution
Asid metanoik dan larutan kalium hidroksida

C Hydrochloric acid and ammonia solution
Asid hidroklorik dan larutan ammonia

D Hydrochloric acid and potassium hydroxide solution
Asid hidroklorik dan larutan kalium hidroksida

20 Diagram 4 shows the standard representation of fluorine atom.
Rajah 4 menunjukkan perwakilan piawai bagi atom fluorin.

$$^{19}_{9}\mathrm{F}$$

Diagram 4
Rajah 4

What is the number of valence electrons of the atom?
Apakah bilangan elektron valens bagi atom tersebut?

A 7
B 8
C 9
D 10

21 Table 1 shows the observation for two reactants.
Jadual 1 menunjukkan pemerhatian bagi dua bahan tindak balas.

Reaction *Tindak Balas*	**Reactant** *Bahan Tindak Balas*	**Observation** *Pemerhatian*
I	CuO and T CuO *dan* T	Blue solution produced *Larutan biru terhasil*
II	$AgNO_3$ and T $AgNO_3$ *dan* T	White precipitate formed *Mendakan putih terbentuk*

Table 1
Jadual 1

What is T?
Apakah T?

A Hydrochloric acid
Asid hidroklorik

B Ethanoic acid
Asid etanoik

C Carbonic acid
Asid karbonik

D Nitric acid
Asid nitrik

22 Diagram 5 shows the percentage by mass of elements in the allicin, which is a compound that causes the smell in garlic.
Rajah 5 menunjukkan peratusan mengikut jisim bagi unsur dalam alisin iaitu sebatian yang menyebabkan bau pada bawang putih.

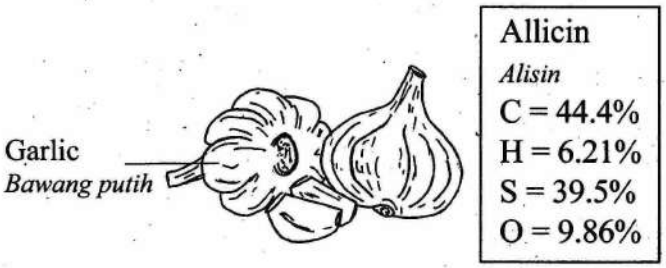


Diagram 5
Rajah 5

What is the empirical formula of allicin?
[Relative atomic mass: H = 1, C = 12, O = 16, S = 32]
Apakah formula empirik bagi alisin?
[*Jisim atom relatif:* H = 1, C = 12, O = 16, S = 32]

A CHSO
B $C_6H_{10}S_2O$
C $C_{12}H_5S_2O$
D $C_{12}H_{10}S_4O$

23 Which of the following are redox reactions?
Antara yang berikut, yang manakah merupakan tindak balas redoks?

I Igniting the gas stove
Menyalakan dapur gas

II Washing oil-stained clothes using detergent
Mencuci pakaian yang terkena kotoran minyak dengan detergen

III Rusting of car's body
Pengaratan pada badan kereta

IV Using hot pack to relieve muscle pain
Menggunakan pek panas untuk meredakan sakit otot

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

24 Table 2 shows the time taken for the metal powder P, Q and R of the same mass to dissolve in dilute nitric acid.
Jadual 2 menunjukkan masa yang diambil bagi serbuk logam P, Q dan R dengan jisim yang sama untuk melarut dalam asid nitrik cair.

Metal ***Logam***	P	Q	R
Time (s) ***Masa* (s)**	25	15	40

Table 2
Jadual 2

What are metals P, Q and R?
Apakah logam P, Q dan R?

	P	Q	R
A	Aluminium *Aluminium*	Zinc *Zink*	Iron *Ferum*
B	Zinc *Zink*	Aluminium *Aluminium*	Iron *Ferum*
C	Iron *Ferum*	Zinc *Zink*	Aluminium *Aluminium*
D	Zinc *Zink*	Iron *Ferum*	Aluminium *Aluminium*

25 The following chemical equation represents the preparation of ammonia gas.
Persamaan kimia berikut mewakili penyediaan gas ammonia.

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

Which of the following is the correct statement?
Antara berikut, penyataan manakah yang betul?

A Two nitrogen molecules react with six hydrogen molecules to produce six ammonia molecules
Dua molekul nitrogen bertindak balas dengan enam molekul hidrogen untuk menghasilkan enam molekul ammonia

B 1.0 g of nitrogen gas reacts with 3.0 g of hydrogen gas to produce 2.0 g of ammonia gas
1.0 g *gas nitrogen bertindak balas dengan* 3.0 g *gas hidrogen untuk menghasilkan* 2.0 g *gas ammonia*

C 1 mol of ammonia gas is produced when 0.5 mol of nitrogen gas reacts with 1.5 mol of hydrogen gas
1 mol *gas ammonia dihasilkan apabila* 0.5 mol *gas nitrogen bertindak balas dengan* 1.5 mol *gas hidrogen*

D Number of atoms in ammonia gas produced is twice the number of atoms in nitrogen gas used
Bilangan atom dalam gas ammonia terhasil adalah dua kali bilangan atom gas nitrogen yang digunakan

26 Diagram 6 shows an invertebrate found in the sea.
Rajah 6 menunjukkan satu invertebrata yang dijumpai dalam laut.

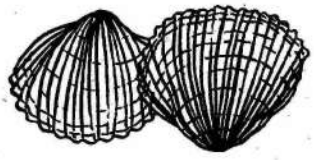


Diagram 6
Rajah 6

The invertebrate's shell is a chemical compound. Which substance has the same physical properties as the compound?
Cangkerang invertebrata adalah satu sebatian kimia. Bahan manakah mempunyai sifat fizik yang sama dengan sebatian tersebut?

A Barium sulphate
Barium sulfat

B Sodium chloride
Natrium klorida

C Naphthalene
Naftalena

D Glucose
Glukosa

27 Table 3 shows the depth of dent after a weight is dropped on the surface of two different materials.
Jadual 3 menunjukkan kedalaman lekuk selepas satu pemberat dijatuhkan ke atas permukaan dua bahan yang berbeza.

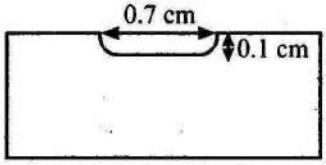
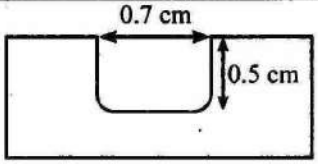
Material ***Bahan***	**Depth of Dent (cm)** ***Kedalaman Lekuk* (cm)**
Duralumin *Duralumin*	
X	

Table 3
Jadual 3

What is X?
Apakah X?

A Steel *Keluli*
B Aluminium *Aluminium*
C Bronze *Gangsa*
D Pewter *Piuter*

28 Diagram 7 shows an interconversion of the state of matter.
Rajah 7 menunjukkan satu perubahan keadaan jirim.

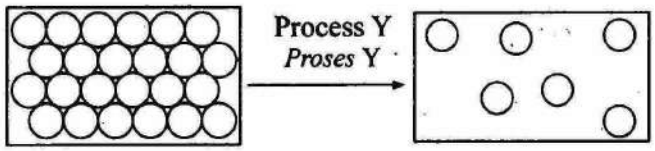


Diagram 7
Rajah 7

Which substance undergoes process Y?
Bahan manakah yang mengalami proses Y?

I Iodine *Iodin*
II Sulphur *Sulfur*
III Magnesium chloride *Magnesium klorida*
IV Ammonium chloride *Ammonium klorida*

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

29 Diagram 8 shows four test tubes that contain different metals immersed in water.
Rajah 8 menunjukkan empat tabung uji yang mengandungi logam yang berbeza direndam di dalam air.

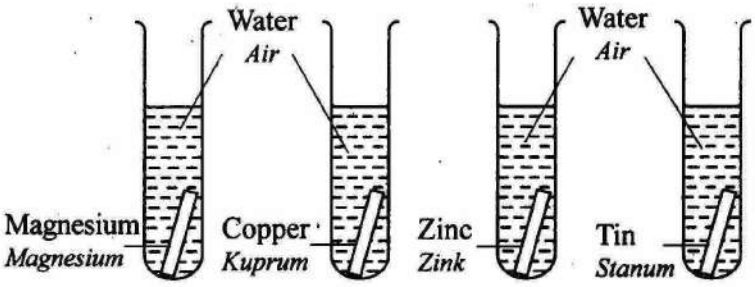


Diagram 8
Rajah 8

Which metal is the slowest to corrode?
Logam manakah yang paling lambat terkakis?

A Magnesium *Magnesium*
B Copper *Kuprum*
C Zinc *Zink*
D Tin *Stanum*

30 Table 4 shows the pH values for four types of aqueous solution P, Q, R and S.
Jadual 4 menunjukkan nilai pH *bagi empat jenis larutan akueus* P, Q, R *dan* S.

Aqueous solution ***Larutan akueus***	P	Q	R	S
pH value ***Nilai* pH**	1	3	7	13

Table 4
Jadual 4

Which aqueous solution has the highest concentration of hydroxide ion?
Larutan akueus manakah yang mempunyai kepekatan ion hidraksida yang paling tinggi?

A P
B Q
C R
D S

Questions **31** and **32** are based on Diagram 9.
Soalan **31** *dan* **32** *berdasarkan Rajah* 9.

Diagram 9 shows the apparatus set-up for a combination of two cells.
Rajah 9 *menunjukkan susunan radas bagi gabungan dua sel.*

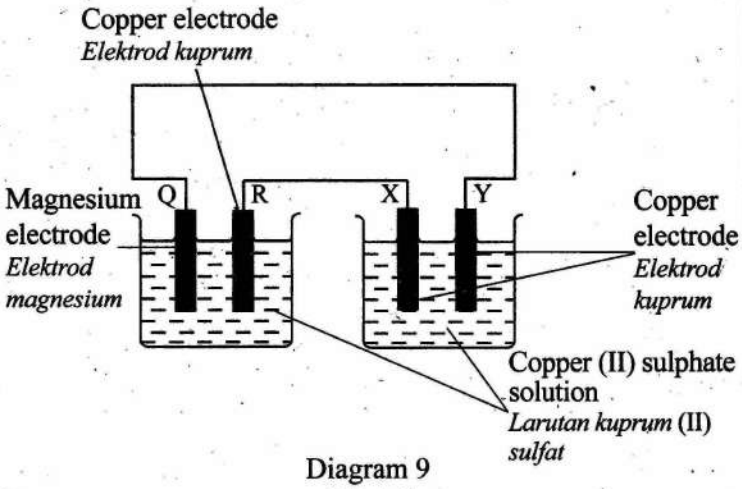


Diagram 9
Rajah 9

31 Which electrodes undergo reduction?
Elektrod manakah yang mengalami penurunan?

A Q and R
Q *dan* R

B Q and X
Q *dan* X

C R and Y
R *dan* Y

D X and Y
X *dan* Y

32 What are the products formed at the anode in both cells?
Apakah hasil yang terbentuk di anod dalam kedua-dua sel?

A Magnesium and copper
Magnesium dan kuprum

B Magnesium ion and copper (II) ion
Ion magnesium dan ion kuprum (II)

C Copper and oxygen
Kuprum dan oksigen

D Hydrogen gas and copper (II) ion
Gas hidrogen dan ion kuprum (II)

33 Diagram 10 shows a graph of reactivity of elements against the proton number of elements X, Y and Z from the same group.
Rajah 10 *menunjukkan graf kereaktifan unsur melawan nombor proton bagi unsur* X, Y *dan* Z *daripada kumpulan yang sama.*

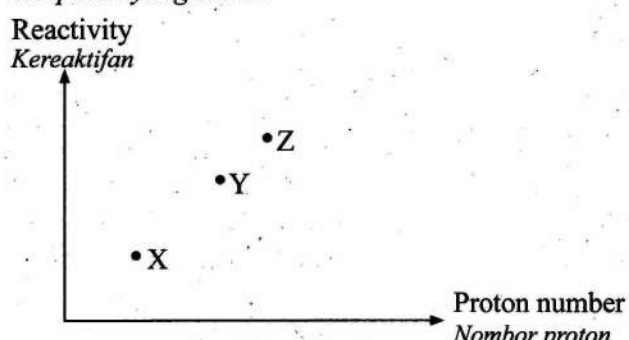


Diagram 10
Rajah 10

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

A React with water to form acidic solution
Bertindak balas dengan air untuk membentuk larutan berasid

B React with sulphuric acid to form white precipitate
Bertindak balas dengan asid sulfurik untuk membentuk mendakan putih

C React in chlorine gas to form white solid
Bertindak balas dalam gas klorin untuk membentuk pepejal putih

D React with sodium hydroxide solution to form sodium halide
Bertindak balas dengan larutan natrium hidroksida untuk membentuk natrium halida

34 Diagram 11 shows a compound that formed from three atoms Q and one atom R through sharing of electrons.
Rajah 11 *menunjukkan sebatian yang terbentuk daripada tiga atom* Q *dan satu atom* R *melalui perkongsian elektron.*

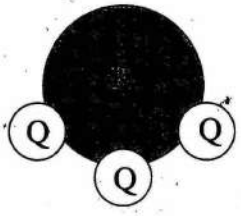


Diagram 11
Rajah 11

What is the property of the compound?
Apakah sifat bagi sebatian tersebut?

A Dissolves in dry propanone
Larut dalam propanon kering

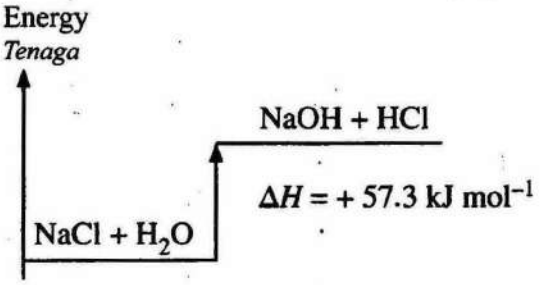
B High melting point
Takat lebur yang tinggi

C Dissolves in water to produce acidic solution
Larut dalam air untuk menghasilkan larutan berasid

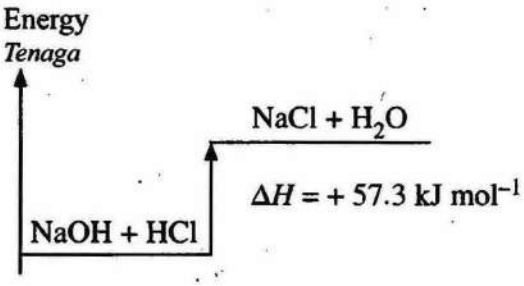
D Conducts electricity in molten state
Mengalirkan arus elektrik dalam keadaan leburan

35 The heat of neutralisation between sodium hydroxide solution and hydrochloric acid is $\Delta H = -57.3$ kJ mol^{-1}
Which of the following energy level diagrams represents the reaction?
Haba peneutralan antara larutan natrium hidroksida dengan asid hidroklorik ialah $\Delta H = -57.3$ kJ mol^{-1}
Antara berikut, gambar rajah aras tenaga yang manakah mewakili tindak balas tersebut?

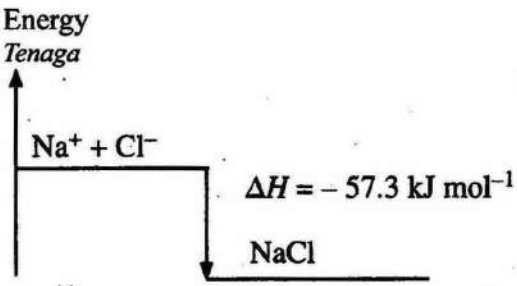
A



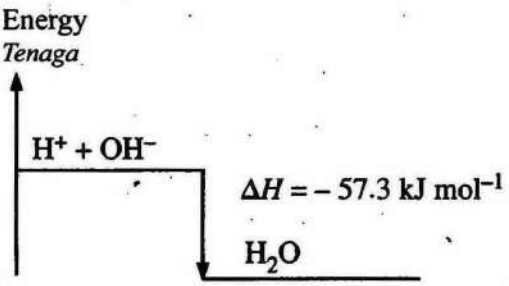
B



C



D



6 Diagram 12 shows a breathalyser that is used on a drunken driver.
Rajah 12 *menunjukkan satu alat penguji pernafasan yang digunakan ke atas seorang pemandu yang mabuk.*

Diagram 12
Rajah 12

What is the substance used in the device?
Apakah bahan yang digunakan dalam alat tersebut?

A Acidified potassium dichromate (VI) solution
Larutan kalium dikromat (VI) *berasid*

B Iron (II) sulphate solution
Larutan ferum (II) *sulfat*

C Potassium iodide solution
Larutan kalium iodida

D Bromine water
Air bromin

37 Element M is located in the same group with iron in the Periodic Table of Elements. Which of the following are the characteristics of M?
Unsur M *terletak dalam kumpulan yang sama dengan ferum dalam Jadual Berkala Unsur.*
Antara yang berikut, yang manakah ciri-ciri bagi M?

I Low melting point
Takat lebur yang rendah

II Poor heat conductor
Konduktor haba yang lemah

III Act as a catalyst
Bertindak sebagai pemangkin

IV Has more than one oxidation number
Mempunyai lebih daripada satu nombor pengoksidaan

A I and II
I *dan* II

B I and III
I *dan* III

C II and IV
II *dan* IV

D III and IV
III *dan* IV

38 Diagram 13 shows the change of substance M to substance L through process Z.
Rajah 13 *menunjukkan perubahan bahan* M *kepada bahan* L *melalui proses* Z.

Substance M ***Bahan* M**	Process Z *Proses* Z →	**Substance L** ***Bahan* L**
• Soluble in water *Larut dalam air* • Reacts with ethanoic acid to produce sweet smell compound *Bertindak balas dengan asid etanoik untuk menghasilkan sebatian berbau wangi*		• Insoluble in water *Tidak larut dalam air* • Decolourise purple colour of acidified potassium manganate (VII) *Menyahwarna ungu larutan kalium manganat* (VII) *berasid*

Diagram 13
Rajah 13

Which of the following is correct about process Z?
Antara yang berikut, yang manakah betul tentang proses Z?

A Passes through hot porcelain chips
Dialirkan melalui serpihan porselin panas

B Steamed at 300 °C with phosphoric acid
Distim pada suhu 300 °C *dengan asid fosforik*

C Reacts with hydrogen chloride at room temperature
Bertindak balas dengan hidrogen klorida pada suhu bilik

D Heated at 180 °C with nickel
Dipanaskan pada suhu 180 °C *dengan nikel*

39 Diagram 14 shows the electron arrangement for X^{2+} ion.
Rajah 14 *menunjukkan susunan elektron bagi ion* X^{2+}.

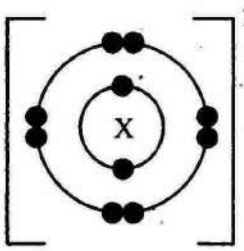
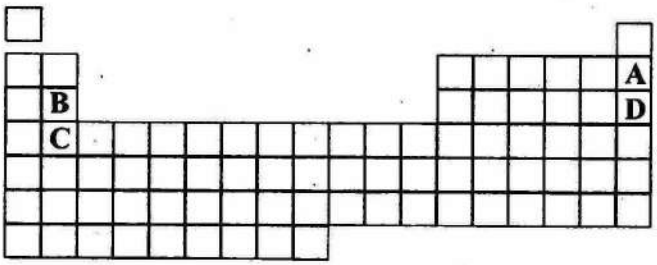


Diagram 14
Rajah 14

Which of the following is the position of element X in the Periodic Table of Element?
Antara yang berikut, yang manakah kedudukan unsur X *dalam Jadual Berkala Unsur?*



40 Vinegar contains ethanoic acid, CH_3COOH.
What is the molarity of the vinegar with concentration of 40 g dm^{-3}?
Cuka mengandungi asid etanoik, CH_3COOH.
Berapakah kemolaran cuka dengan kepekatan 40 g dm^{-3}?
[Relative atomic mass: H = 1, C = 12, O = 16]
[*Jisim atom relatif:* H = 1, C = 12, O = 16]

A $\frac{40}{60}$ mol dm^{-3}

B $\frac{60}{40}$ mol dm^{-3}

C $\frac{40}{60} \times 1000$ mol dm^{-3}

D $\frac{60}{40} \times 1000$ mol dm^{-3}

41 Diagram 15 shows an energy level diagram for a chemical reaction between 50 cm^3 of 1 mol dm^{-3} sodium hydroxide solution and 50 cm^3 of 1 mol dm^{-3} ethanoic acid.
[Specific heat capacity of water: 4.2 Jg^{-1} K^{-1}]
Rajah 15 *menunjukkan gambar rajah aras tenaga bagi tindak balas kimia antara* 50 cm^3 *larutan natrium hidroksida* 1 mol dm^{-3} *dengan* 50 cm^3 *asid etanoik* 1 mol dm^{-3}.
[*Muatan haba tentu:* 4.2 Jg^{-1} K^{-1}]

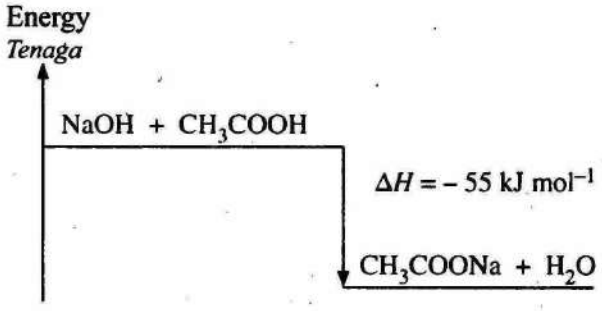


Diagram 15
Rajah 15

What is the temperature change in the reaction?
Apakah perubahan suhu bagi tindak balas tersebut?

A 1.3 K **C** 13.1 K
B 6.5 K **D** 119.0 K

42 Diagram 16 shows the graph of the volume of gas released against time for the reaction between calcium carbonate and hydrochloric acid.
Rajah 16 *menunjukkan graf isi padu gas yang terbebas melawan masa bagi satu tindak balas antara kalsium karbonat dengan asid hidroklorik.*

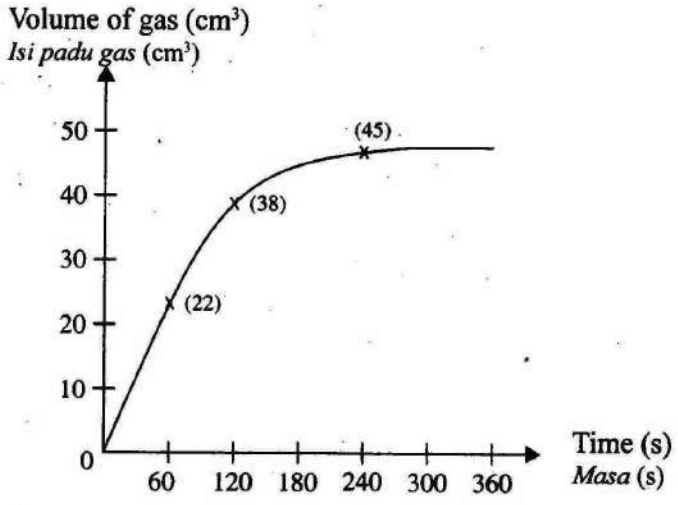


Diagram 16
Rajah 16

What is the average rate of reaction in the second minute?
Apakah kadar tindak balas purata dalam minit kedua?

A 22.5 cm^3 per minute
22.5 cm^3 *per minit*

B 19.0 cm^3 per minute
19.0 cm^3 *per minit*

C 16.0 cm^3 per minute
16.0 cm^3 *per minit*

D 8.0 cm^3 per minute
8.0 cm^3 *per minit*

43 What is the percentage of composition by mass of carbon atoms per molecule in octane, C_8H_{18}?
[Relative atomic mass: H = 1, C = 12]
Apakah peratus komposisi mengikut jisim bagi atom karbon per molekul dalam oktana, C_8H_{18}?
[*Jisim atom relatif:* H = 1, C = 12]

A 15.79%
B 30.80%
C 69.32%
D 84.21%

44 The following chemical equation represents the extraction of silicon from quartz using coke.
Persamaan kimia berikut mewakili pengekstrakan silikon daripada kuarza menggunakan kok.

$$SiO_2 + C \longrightarrow Si + CO_2$$

What is the change in oxidation number of silicon?
Apakah perubahan nombor pengoksidaan silikon?

A +2 to 0
+2 *kepada* 0

B +4 to 0
+4 *kepada* 0

C 0 to +2
0 *kepada* +2

D 0 to +4
0 *kepada* +4

45 The following chemical equation represents a reaction between sulphuric acid and potassium hydroxide solution.
Persamaan kimia berikut mewakili tindak balas antara asid sulfurik dengan larutan kalium hidroksida.

$$H_2SO_4 + 2KOH \longrightarrow K_2SO_4 + 2H_2O$$

What is the volume of 0.5 mol dm^{-3} sulphuric acid required to neutralise 25 cm^3 of 0.1 mol dm^{-3} potassium hydroxide?
Apakah isi padu asid sulfurik 0.5 mol dm^{-3} *yang diperlukan untuk meneutralkan* 25 cm^3 *larutan kalium hidroksida* 0.1 mol dm^{-3}?

A 2.5 cm^3
B 3.0 cm^3
C 3.5 cm^3
D 4.2 cm^3

46 Given that heat of combustion of ethanol is -1376 kJ mol^{-1}. What is the fuel value of ethanol?
[Relative atomic mass: H = 1, C = 12, O = 16]
Diberi haba pembakaran etanol ialah -1376 kJ mol^{-1}. *Berapakah nilai bahan api bagi etanol*?
[*Jisim atom relatif:* H = 1, C = 12, O = 16]

A 18.6 kJ g^{-1}
B 22.9 kJ g^{-1}
C 29.9 kJ g^{-1}
D 31.3 kJ g^{-1}

47 The following equations represent two stages in the manufacture of nitric acid from ammonia.
Persamaan berikut mewakili dua peringkat dalam pembuatan asid nitrik daripada ammonia.

Stage 1 *Peringkat* 1	$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$
Stage 2 *Peringkat* 2	$4NO + 2H_2O + 3O_2 \rightarrow 4HNO_3$

480 dm^3 of ammonia is used to produce nitric acid in 60 minutes.
What is the mass of nitric acid produced in 30 minutes?
[Relative atomic mass: O = 16; N = 14; H = 1; Molar volume of gas = 24.0 dm^3 mol^{-1}]
480 dm^3 *ammonia digunakan untuk menghasilkan asid nitrik dalam tempoh* 60 *minit.*
Berapakah jisim asid nitrik yang telah dihasilkan dalam tempoh 30 *minit?*
[*Jisim atom relatif:* O = 16; N = 14; H = 1; *Isi padu molar gas* = 24.0 dm^3 mol^{-1}]

A 630 g
B 1260 g
C 2520 g
D 5040 g

48 The following equation represents the reaction between zinc and hydrochloric acid.

Persamaan berikut mewakili tindak balas antara zink dan asid hidroklorik.

$$Zn + 2HCl \longrightarrow ZnCl_2 + H_2$$

What is the volume of hydrogen gas produced when 6.5 g of zinc reacts with hydrochloric acid at standard temperature and pressure (STP)?

[Relative atomic mass: Zn = 65; H = 1; Molar volume of gas at STP: 22.4 $dm^3\ mol^{-1}$]

Berapakah isi padu gas hidrogen yang terhasil apabila 6.5 g *zink bertindak balas dengan asid hidroklorik pada suhu dan tekanan piawai* (STP)?

[*Jisim atom relatif*: Zn = 65; H = 1; *Isi padu molar gas pada* STP: 22.4 $dm^3\ mol^{-1}$]

A 0.10 dm^3 **C** 2.24 dm^3

B 1.12 dm^3 **D** 4.48 dm^3

49 Diagram 17 shows the preparation of lead (II) sulphate salt using sodium sulphate solution and lead (II) nitrate solution.

Rajah 17 *menunjukkan penyediaan garam plumbum* (II) *sulfat menggunakan larutan natrium sulfat dan larutan plumbum* (II) *nitrat.*

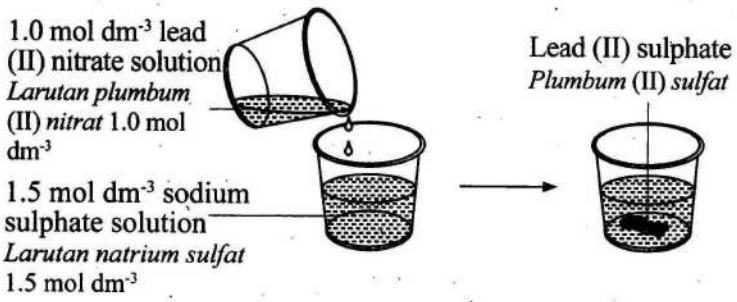


Diagram 17
Rajah 17

What is the volume of sodium sulphate solution needed to react completely with 50 cm^3 of the lead (II) nitrate solution?

Berapakah isi padu larutan natrium sulfat yang diperlukan untuk bertindak balas secara lengkap dengan 50 cm^3 *larutan plumbum* (II) *nitrat tersebut*?

A 75.0 cm^3 **C** 48.5 cm^3

B 50.0 cm^3 **D** 33.3 cm^3

50 Diagram 18 is a bar chart that shows the difference in production of sulphuric acid by two companies, Company X and Company Y in the first quarter of the year.

Rajah 18 *adalah satu carta bar yang menunjukkan perbezaan dalam penghasilan asid sulfurik oleh dua buah syarikat iaitu Syarikat* X *dan Syarikat* Y *pada suku pertama tahun tersebut.*

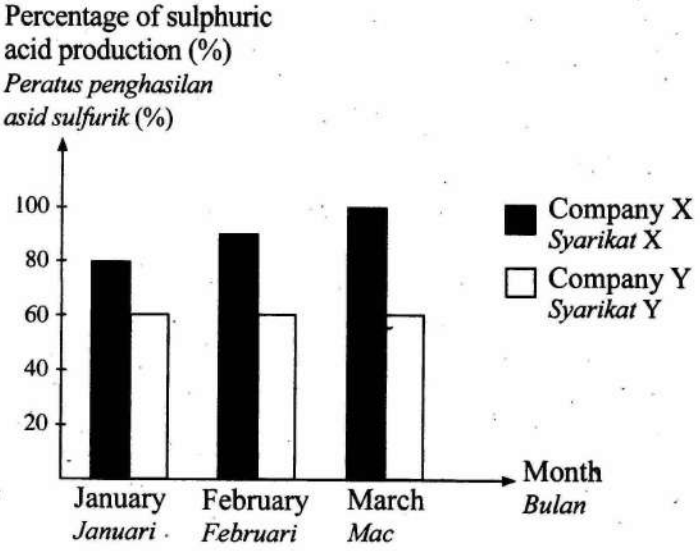


Diagram 18
Rajah 18

A production manager from Company Y is given the responsibility to overcome the problem of the company. What should he do to solve the problem?

Seorang pengurus pengeluaran daripada Syarikat Y *telah diberi tanggungjawab untuk mengatasi masalah syarikat itu. Apakah yang dia patut lakukan bagi menyelesaikan masalah tersebut*?

A Use bigger size of sulphur
Guna sulfur yang bersaiz lebih besar

B Increase the volume of water used
Tingkatkan isi padu air yang digunakan

C Use platinum to replace vanadium (V) oxide
Guna platinum untuk menggantikan vanadium (V) *oksida*

D Increase the temperature of the production process
Tingkatkan suhu bagi proses penghasilan

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT