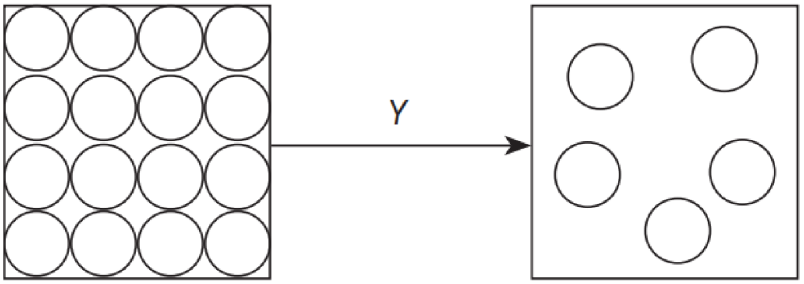
1. Antara yang berikut, yang manakah merupakan contoh bagi jirim?
   Which of the following is an example of matter?

   A. Haba
      Heat
   B. Cahaya
      Light
   C. Air
      Water
   D. Api
      Fire

2. Rajah 1 menunjukkan susunan zarah-zarah bagi suatu bahan yang mengalami perubahan keadaan fizikal melalui proses Y.
   Diagram 1 shows the arrangement of particles of a substance that undergo change in the physical state through process Y



Rajah 1 / *Diagram 1*

Antara bahan berikut, yang manakah mengalami proses Y?
Which of the following substances undergo process Y?

I. Bromin
   Bromine
II. Iodin
   Iodine
III. Klorin
   Chorine
IV. Naftalena
   Naphthalene

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

3. Rajah 2 menunjukkan perwakilan piawai bagi natrium-23.
Diagram 2 shows the standard represented for sodium-23

$$^{23}_{11}Na$$

Rajah 2 / *Diagram 2*

Antara berikut yang manakah betul bagi ion Na^+?
Which of the following statements is correct for Na^+ ion?

	Bilangan proton *Number of protons*	Bilangan neutron *Number of neutrons*	Bilangan electron *Number of electron*
A	11	12	11
B	11	12	10
C	10	13	11
D	12	11	10

4. Jadual 1 menunjukkan takat lebur dan takat didih bahan P, Q, R dan S.
Table 1 below shows the melting and boiling points of substances P, Q, R and S.

Bahan *Substance*	Takat Lebur (°C) *Melting point (°C)*	Takat didih (°C) *Boiling point (°C)*
P	-75	-15
Q	-20	97
R	35	147
S	5	120

Jadual 1 / *Table 1*

Bahan yang manakah cecair pada suhu bilik?
Which substances is a liquid at roon temperature?

A Q sahaja
Q only

B R sahaja

R only

C Q dan S
Q and S

D R dan S
R and S

5. Antara berikut, yang manakah pasangan yang betul?
Which of the following pairs are matched correctly?

	Atom *Atom*	Ion *Ion*	Molekul *Molecule*
A	Ammonia *Ammonia*	Natrium klorida *Sodium chloride*	Karbon *Carbon*
B	Magnesium *Magnesium*	Raksa *Mecury*	Karbon dioksida *Carbon dioxide*
C	Natrium *Sodium*	Litium oksida *Lithium oxide*	Bromin *Bromine*
D	Kuprum (II) Sulfat *Copper (II) Sulphate*	Sulfur dioksida *Sulphur dioxide*	Hidrogen *Hydrogen*

6. Antara pasangan sifat fizik berikut, yang manakah benartentang magnesium klorida?
Which of the following pairs of physical properties of magnesium chloride is true?

	Keterlarutan dalam air *Solubility in water*	Kekonduksian elektrik dalam larutan akues *Electrical conductivity in aqueous solution*
A	Larut *Soluble*	Boleh mengkonduksi arus elektrik *Able to conduct electricity*
B	Tidak larut *Insoluble*	Boleh mengkonduksi arus elektrik *Able to conduct electricity*
C	Larut *Soluble*	Tidak boleh mengkonduksi arus elektrik *Unable to conduct electricity*

D	Tidak larut *Insoluble*	Tidak boleh mengkonduksi arus elektrik *Unable to conduct electricity*

7. Persamaan di bawah mewakili tindak balas untuk mengeluarkan aluminium daripada aluminium oksida
The equation below represent the reaction to extract aluminium from aluminium oxide

$$2Al_2O_3 \longrightarrow 4Al + 3O_2$$

Apakah jisim aluminium yang dikeluarkan daripada 102 g aluminium oksida
What is the mass of aluminium that can be extracted from 102 g aluminium oxide.

A 13.5 g
B 27.0 g
C 41.5 g
D 54.0 g

8. Antara yang berikut, yang manakah merupakan ciri istimewa bagi logam peralihan?
Which of the following are the special characteristics of transition elements

I. Membentuk sebatian berwarna
Form coloured compounds
II. Boleh digunakan sebagai mangkin
Can be used as a catalyst
III. Mempunyai takat lebur yang rendah
Have a low melting point
IV. Mempunyai satu nombor pengoksidaan sahaja
Have only one oxidation number

A I sahaja
I only
B I dan II
I and II
C I, II dan III
I, II and III
D I, II, III dan IV
I, II, III and IV

9. Pernyataan berikut merujuk kepada sumbangan seorang ahli sains dalam membangunkan Jadual Berkala.

The following statement refer to the contributions of scientist in the development of the Periodic Table.

- Mengkaji frekuensi sinar-X yang dibebaskan oleh pelbagai unsur dan akhirnya menemui hubungan spectrum sinar-X dengan nombor proton.

Studied the frequency of X-ray released by various elements and eventually found in a relationship between the X-ray spectrum and proton numbers.

- Menyusun unsur dalam Jadual Berkala Unsur mengikut tertib nombor proton yang menaik.

The arranged the elements in Periodic Table of Elements according to their increasing proton numbers.

Siapakah ahli sains itu?
Who was the scientist?

A John Newlands

B Lothar Meyer

C Dmitri Mendelev

D Henry Moseley

10. Ciri manakah yang **betul** tentang unsur-unsur dalam kumpulan 1 dalam Jadual Berkala Unsur apabila menuruni kumpulan?
*Which characteristics is **correct** about elements in Group 1 in the Periodic Table as going down the group?*

A Kecenderungan menerima elektron berkurang
The tendency to release electron decrease

B Kereaktifan berkurang
The reactivity decrease

C Semua adalah konduktor haba
All are conductor of heat

D Semua tidak larut dalam air
All insoluble in water

11. Antara bahan-bahan berikut, yang manakah merupakan asid monoprotik?
Which of the following substances is a monoprotic acid?

A Asid propanoik, C_2H_5COOH
Propanoic acid, C_2H_5COOH

B Asid fosforik, H_3PO_4
Phosphoric acid, H_3PO_4

C Asid sulfurik, H_2SO_4

Sulphuric acid, H_2SO_4

D Asid karbonik, H_2CO_3
Carbonic acid, H_2CO_3

12. 1.08 g unsur X bergabung dengan y g oksigen untuk membentuk satu oksida logam dengan formula empirik X_2O_3. Apakah nilai y?
(Jisim atomrelatif : X = 27, O = 16)
1.08 g of element X combines with y g of oxygen to form a metal oxide with the empirical formula X_2O_3. What is the value of y?
(Relative atomic mass : X = 27, O = 16)

A 0.48 g
B 0.96 g
C 1.44 g
D 1.92 g

13. Jisim molekul relatif bagi $M_2(SO_4)_3$ ialah 342. Berapakah jisim atom relatif bagi unsur M? (Jisim atom relative : O = 16, S = 32)
The relative molecular mass of $M_2(SO_4)_3$ is 342. What is the relative atomic mass of element M? (Relative atomic mass : O = 16, S = 32)

A 27
B 54
C 118
D 123

14. Jadual 2 menunjukkan keadaan bahan tindak balas yang digunakan dalarn eksperimen I dan eksperimen II.

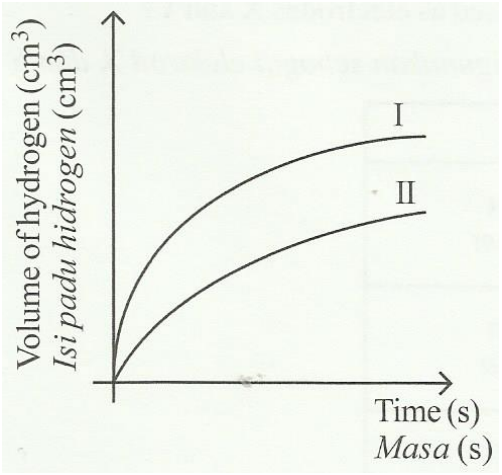
Table 2 shows the condition of reactants used in experiment I and experiment II.

Eksperimen *Experiment*	Keadaan bahan tindak balas *Condition of reactants*
I	Ketulan zink berlebihan + 50 cm^3 asid hidroklorik 2.0 mol dm^{-3} *Excess zinc granules + 50 cm_3 of 2.0 mol dm^{-3} hydrochloric acid*
II	Serbuk zink berlebihan + 50 cm^3 asid hidroklorik 2.0 mol dm^{-3} *Excess zinc powder + 50 cm^3 of 2.0 mol dm^{-3} hydrochloric acid*

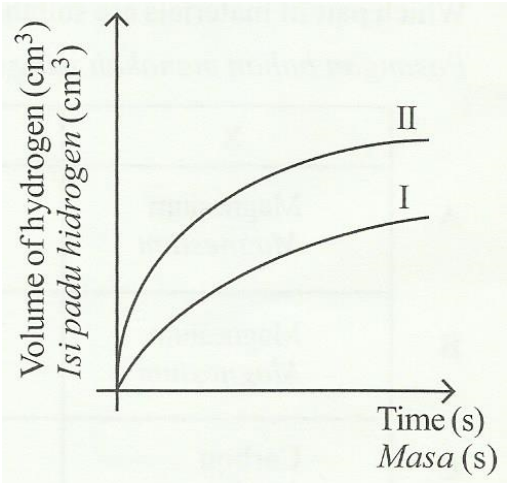
Jadual 2 / *Table 2*

Graf manakah yang menunjukkan lengkung yang betul bagi eksperimen I dan eksperimen II?
Which graph shows the correct curve for experiment I and experiment II?

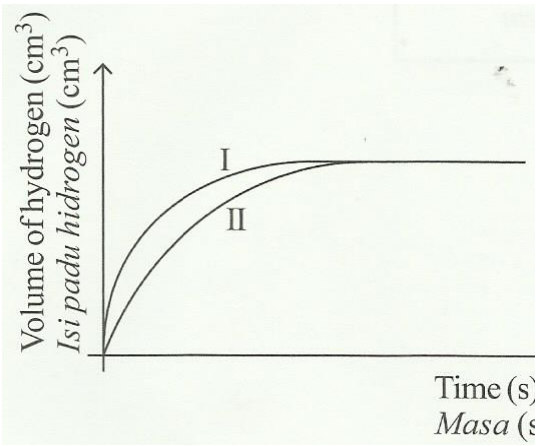
A



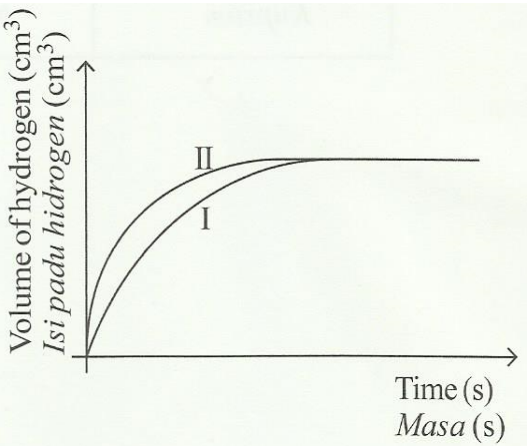
B



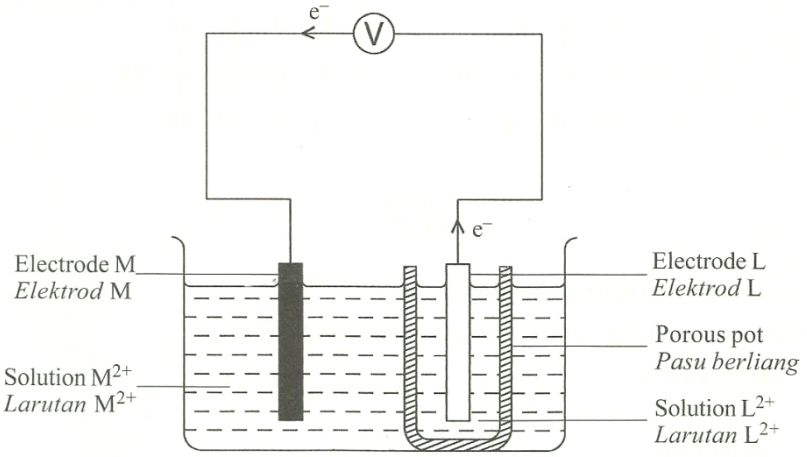
C



D



15. Rajah 3 menunjukkan satu sel kimia. Elektron bergerak dari elektrod L ke elektrod M melalui litar.
Diagram 3 shows a chemical cell. The electrons move from electrode L to electrode M through the circuit.



Rajah 3 / *Diagram 3*

Penyataan manakah yang betid tentang tindak balas dalam sel kimia itu?
Which statement is correct about the reaction in the chemical cell?

A Ion M^{2+} dioksidakan
Ion M^{2+} is oxidised
B L lebih elektropositif daripada M
L is more electropositive than M
C Penurunan berlaku di elektrod L
Reduction occurs at electrode L
D L ialah zink dan M ialah magnesium
L is zinc and M is magnesium

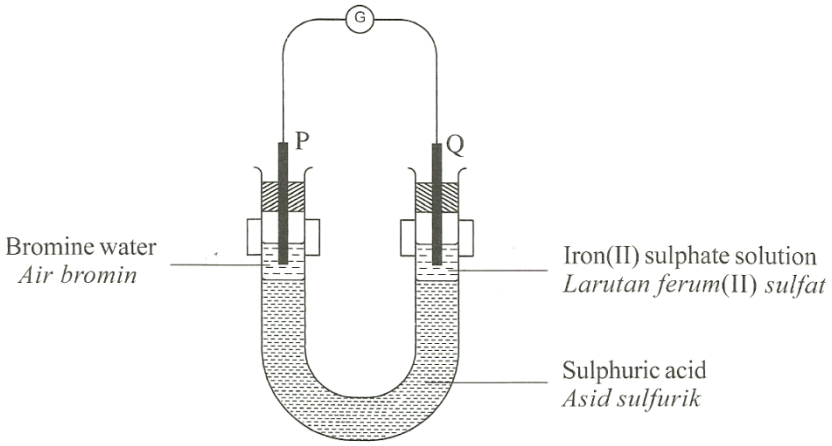
16. Antara berikut, yang manakah **tidak benar** tentang mangkin?
Which of the following is incorrect about catalyst?

A Mangkin biologi dipanggil enzim
Boilogical catalyst are called enzymes
B Mangkin tidak ditulis dalam persamaan seimbang
Catalyst do not appear in the balanced equation
C Mangkin meningkatkan tenaga pengaktifan untuk tindak balas
Catalyst increase the activation energy for a reaction
D Mangkin diperlukan dalam kuantiti kecil sahaja untuk mempercepatkan tindak balas.
Only a small amount of catalyst is required to accelerate a reaction.

17. Antara berikut, yang manakah teori yang digunakan untuk menjelaskan bagaimana faktor yang berbeza mempengaruhi kadar tindak balas?
Which of the following is the name of the theory which is used to explain how different factors affect the rate of a reaction?

A Teori zarah
Particle theory
B Teori resapan
Diffusion theory
C Teori perlanggaran
Collision theory

18. Rajah 4 menunjukkan susunan radas untuk mengkaji pemindahan elektron pada suatu jarak.
Diagram 4 shows the apparatus set-up to study the transfer of electron at a distance.



Rajah 4 / *Diagram 4*

Antara yang berikut, yang manakah berlaku dalam Rajah 4?
Which of the following occurs in Diagram 4?

A Ferum terenap di elektrod Q
Iron deposited at electrode Q
B Elektron mengalir melalui asid sulfurik
Electrons flow through sulphuric acid
C Gas hidrogen terbebas di elektrod P
Hydrogen gas releasedat electrode P
D Warna perang bromin menjadi tidak berwarna
Brown colour of bromine turns to colouless

19. Persamaan berikut menunjukkan penukaran butanol kepada butena.
The following equation shows the conversion of butanol to butane.

$$C_4H_9OH \xrightarrow[\text{Panaskan / } \textit{Heat}]{\text{Proses X / } \textit{Process X}} C_4H_8 + H_2O$$

Apakah proses X ?
What is process X?

A Pengoksidaan
Oxidation
B Hidrolisis
Hydrolisis
C Pendehidratan
Dehydration

D Penghidrogenan
Hydrogenation

20. Antara berikut yang manakah bes?
Which of the following is a base?

A Jus epal
Apple juice
B Garam buluh
Bamboo salt
C Serbuk penaik
Baking soda
D Minuman ringan
Soft drink

21. Antara yang berikut, yang manakah garam yang tidak larut dalam air?
Which of the following is a salt that does not dissolve in water?

A Magnesium nitrat
Magnesium nitrate
B Aluminium klorida
Aluminium chloride
C Barium sulfat
Barium sulphate
D Natrium karbonat
Sodium carbonate

22. Antara berikut yang manakah ciri gas hidrogen klorida yang membolehkan sifat keasidan dapat ditunjukkan?
Which of the following is the characteristic of hydrogen chloride gas that enables its acidic properties to be shown?

A Mengion di dalam air
Ionise in water
B Melarut di dalam air
Dissolve in water
C Mengandungi ion hidrogen dalam molekul
Contain hydrogen ion in its molecule
D Mengion dalam air dan menghasilkan ion hidrogen
Ionise in water and produce hydrogen ion

23. Berapakah nilai pH larutan natrium hidroksida , 0.1 mol dm^{-3}?
What is the pH value of sodium hydroxide 0.1 mol dm^{-3}?

A 11

B 12
C 13
D 14

24. Pemanasan zink nitrat menghasilkan gas berwarna perang. Apakah gas itu?
Heating of zinc nitrate produces brown gas. What is the gas?

A Gas nitrogen dioksida
Nitrogen dioxide gas
B Gas sulphur dioksida
Sulphur dioxide gas
C Gas karbon dioksida
Carbon dioxide gas
D Gas hidrogen klorida
Hydrogen chloride gas

25. Faizal ingin menyediakan 250cm^3 larutan natrium hidroksida 0.3 mol dm^{-3}.
Berapakah jisim natrium hidroksida yang Faizal perlukan untuk menghasilkan larutan tersebut?
(JIsim atom relative : Na = 23, O = 16, H = 1)
Faizal wants to prepare 250cm^3 of 0.3 mol dm^{-3} sodium hydroxide solution. What is the mass of sodium hydroxide does Faizal need to produce the solution?
(Relative atomic mass : Na = 23, O = 16, H = 1)

A 0.075 g
B 1.000 g
C 2.075 g
D 3.000 g

26. Serbuk zink berlebihan ditindak balaskan dengan 100cm^3 asid hidroklorik 0.1 mol dm^{-3}.
Berapakah isipadu gas yang terhasil pada keadaan bilik?
(1 mol gas menepati 24dm^3 pada keadaan bilik)
Excess zinc powder is reacted with 100cm^3 of 0.1 mol dm^{-3} hydrochloric acid.
What is the volume of gas produced at room condition?
(1 mol of gas occupies 24dm^3 at room condition)

A 0.01 dm^3
B 0.12 dm^3
C 0.24 dm^3
D 0.42 dm^3

27. Satu ujian dijalankan untuk mengesahkan kation dan anion yang hadir dalam satu larutan garam. Jadual menunjukkan pemerhatian bagi setiap ujian.
A series of tests are conducted to verify the cation and anion that is present in a salt solution. Table shows the observation for each test.

Ujian / Test	Pemerhatian / Observation
Tambah larutan natrium hidroksida secara berlebihan ke dalam larutan garam *Add excess of sodium hydroxide solution into the salt solution*	Mendakan putih terbentuk dan tidak larut Dalam larutan natrium hidroksida yang berlebihan. *White precipitate formed and insoluble in excess sodium hydroxide*
Tambah larutan ammonia secara berlebihan ke dalam larutan garam *Add excess of ammonia solution into a salt solution*	Mendakan putih terbentuk dan larut dalam larutan ammonia yang berlebihan. *White precipitate formed and soluble in excess ammonia solution.*

Antara yang berikut yang manakah kation yang hadir dalam larutan garam tersebut?
Which of the following is the cation present in the salt solution?

A Ion Ca^{2+}
B Ion Mg^{2+}
C Ion Zn^{2+}
D Ion Pb^{2+}

28. Seramik termaju diperbuat daripada sebatian organic seperti oksida, karbida dan nitride. Antara bahan berikut yang manakah diperbuat daripada seramik termaju?
Advanced ceramics are made from inorganiccompounds such as oxides, carbides and nitrides. Which of the following is made from advance ceramics?

A Cenderahati
Souvenirs
B Mangkuk
Bowl
C Landasan keretapi
Railway track
D Cakera brek
Brake disc

29. Rajah 5 menunjukkan kaca mata yang diperbuat daripada sejenis kaca. Kaca mata ini dapat melindungi mata daripada sinar ultraungu (UV) yang berbahaya.
Diagram 5 shows a spectacle made from a type of glass. The spectacle can protect our eyes from dangerous ultraviolet (UV) rays.

Rajah 5 / *Diagram 5*

Antara berikut yang manakah bahan kimia yang digunakan dalam kaca itu?
Which of the following substance is the chemical used in the glass?

A Boron oksida
Boron oxide
B Plumbum (II) oksida
Lead (II) oxide
C Plumbum (II) klorida
Lead (II) chloride
D Argentum klorida
Silver chloride

30. Apakah formula am bagi alkena?
What is the general formula of alkenes?

A C_nH_{2n+2}
B C_nH_{2n}
C $C_nH_{2n+1}OH$
D $C_nH_{2n+}1COOH$

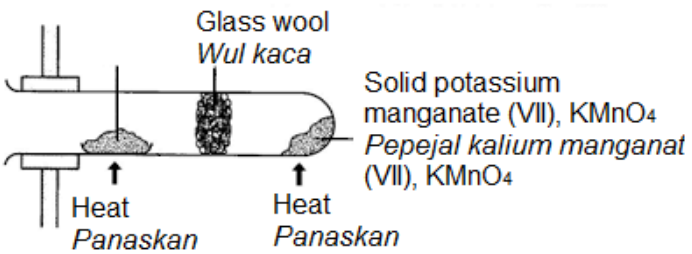
31. Rajah 6 menunjukkan sejenis bunga yang berbau harum.
Diagram 6 shows a flower that has a plesant fragrance.

Rajah 6 / *Diagram 6*

Apakah nama bahan yang memberikan haruman itu?
What is the name of the substance that gives the pleasant fragrance?

A Benzil etanoat
Benzyl ethanoate
B Etana – 1,2 – diol
Ethane – 1,2 - diol
C Asid etanoik
Ethanoic acid
D Etanol
Ethanol

32. Rajah 7 menunjukkan susunan radas untuk mengkaji kereaktifan suatu logam dengan oksigen. Warna hasil yang terbentuk adalah kuning apabila panas dan putih apabila sejuk.
Diagram 7 shows the apparatus set-up to study the reactivity of a metal with oxygen. The colour of the product formed is yellow when hot and white when cold.



Rajah 7 / *Diagram 7*

Apakah logam itu?
What is the metal?

A Ferum
Iron
B Zink
Zinc
C Plumbum
Lead
D Kuprum
Copper

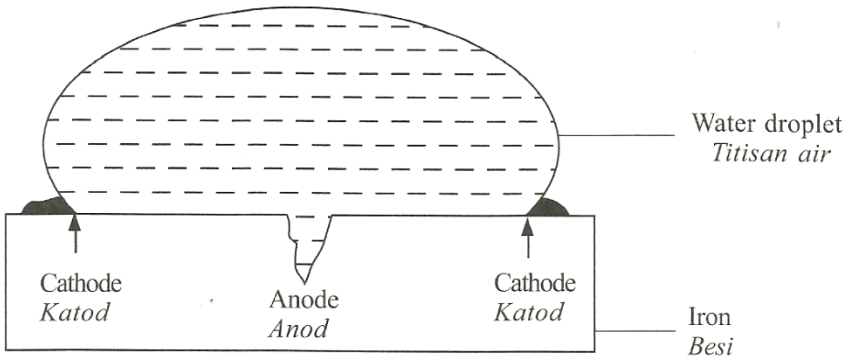
33. Persamaan ion berikut mewakili tindak balas antara larutan kalium dikromat(VI) berasid dengan larutan ferum(II) sulfat.
The following ionic equation represents the reaction between acidified potassium dichromate(VI) solution and iron(II) sulphate solution.

$$Cr_2O_7^{-2} + 14H^+ + 6Fe^{2+} \rightarrow 6Fe^{3+} + 2Cr^{3+} + 7H_2O$$

Apakah perubahan nombor pengoksidaan kromium dalam tindak balas itu?
What is the change of oxidation number of chromium in the reaction?

A +6 kepada +2
+6 to +2
B +6 kepada +3
+6 to +3
C +7 kepada +2
+7 to +2
D +7 kepada +3
+7 to +3

34. Rajah 8 menunjukkan setitis air di atas sebatang besi.
Diagram 8 shows a water droplet on a piece of iron.



Rajah 8 / *Diagram 8*

Persamaan manakah yang berlaku di katod
Which equation occur at the cathode

A $Fe \quad Fe^{2+} + 2e$
B $Fe^{2+} + 2e^- \quad Fe$
C $O_2 + 2H_2O + 4e \quad 4OH^-$
D $4OH^- \quad O_2 + 2H_2O + O_2$

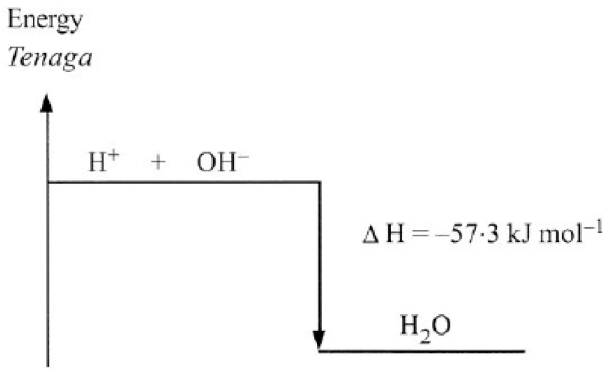
35. Kation manakah yang membentuk kekat dengan sabun?
Which cation forms scum with soap?

A Na^+
B Mg^{2+}
C Al^{3+}
D NH_4^+

36. Bahan yang manakah digunakan untuk menukarkan ion ferum (III) kepada Ion ferum (II) ?
Which substance is used to change iron (III) ion to iron (II) ion?

A Air bromin
Bromine water
B Larutan kalium iodida
Potassium iodide solution
C Larutan kalium dikromat (VI)
Potassium dichromate (VI) solution
D Larutan kalium manganat (VII) berasid
Acidified potassium manganate (VII) solution

37. Rajah 9 menunjukkan aras tenaga bagi satu tindak balas.
Diagram 9 shows an energy level of a reaction.

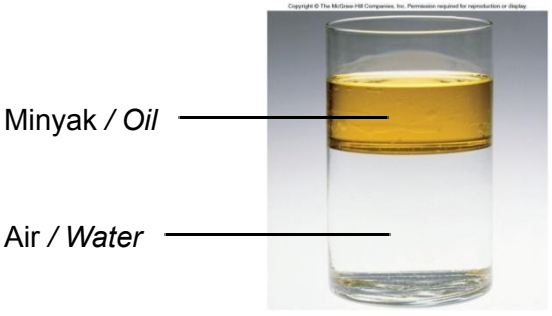


Rajah 9 / *Diagram 9*

Apakah jenis tindak balas itu?
What is the type of the reaction?

A Penurunan
Reduction
B Pengoksidaan
Oxidation
C Endotermik
Endothermic
D Eksotermik
Exothermic

38. Rajah 10 menunjukkan gelas yang mengandungi dua lapisan bahan.
Diagram 10 shows a glass containing two layers of substances



Rajah 10 / *Diagram 10*

Bahan tambah makanan manakah yang paling sesuai ditambah untuk memastikan kedua-dua bahan itu bercampur?
Which food additive is the most suitable to be added to ensure both substances are mixed?

A Penstabil
Stabilizer
B Antioksida
Antioxidant
C Pengawet
Preservative
D Perisa
Flavouring

39. Persamaan termokimia mewakili tindak balas antara asid nitrik dan larutan kalium hidroksida.

The thermochemical equation represents the reaction between nitric acid and potassium hydroxide solution.

$HNO_3 + KOH \rightarrow KNO_3 + H_2O \quad ; \Delta H = -57 \text{ kJ mol}^{-1}$

Berapakah haba yang terbebas apabila 50 cm^3 asid nitrik 2.0 mol dm^{-3} ditambahkan kepada 25 cm^3 larutan kalium hidroksida 2.0 mol dm^{-3}?
What is the heat released when 50 cm^3 of 2.0 mol dm^{-3} nitric acid is added to 25 cm^3 of 2.0 mol dm^{-3} potassium hydroxide solution?

A 2.85 kJ
B 5.70 kJ
C 13.50 kJ
D 21.00 kJ

40. Satu asid dwibes H_2X mempunyai kepekatan 1.0 mol dm^{-3}**.** Berapakah isi padu asid H_2X yang diperlukan untuk meneutralkan 25.0 cm^3 larutan natrium hidroksida 1.0 mol dm^{-3} , NaOH?
*A diprotic acid, H_2X has a concentration of 1.0 mol dm^{-3}**.** What is the volume of H_2X needed to neutralise 25.0 cm^{-3} of 1.0 mol dm^{-3} sodium hydroxide solution, NaOH?*

A 10.5 cm^3
B 12.5 cm^3
C 21.0 cm^3
D 25.0 cm^3

KERTAS SOALAN TAMAT

END OF QUESTION PAPER