

1. Antara pasangan berikut, yang manakah dipadankan dengan betul?

Which of the following pair is matched correctly?

	Bidang <i>Field</i>	Bahan kimia <i>Chemicals</i>
A	Makanan <i>Food</i>	Antiseptik <i>Antiseptic</i>
B	Pertanian <i>Agriculture</i>	Pengawet <i>Preservative</i>
C	Perubatan <i>Medicine</i>	Penstabil <i>Stabiliser</i>
D	Perindustrian <i>Industry</i>	Detergen <i>Detergent</i>

2. Siapakah saintis yang menemui zarah yang dipanggil atom?

Who was the scientist who discovered the particle called atoms?

- A John Dalton
- B J. J. Thomson
- C James Chadwick
- D Ernest Rutherford

3. Apakah nama lain bagi unsur-unsur yang terletak antara Kumpulan 3 dan Kumpulan 12 dalam Jadual Berkala?

What is the other name for the elements placed between Group 3 and Group 12 in the Periodic Table?

- A Halogen
Halogen
- B Logam alkali
Alkali metal
- C Unsur peralihan
Transition element
- D Logam alkali bumi
Alkaline Earth metal

4. Ikatan berikut terhasil daripada perkongsian elektron kecuali.
The following bonds formed from the sharing of electron except

- A ikatan datif
dative bond
- B ikatan kovalen
covalent bond
- C ikatan hidrogen
hydrogen bond

5. Jadual 1 menunjukkan nilai pH bagi larutan P, Q, R dan S.
Table 1 shows the pH values of P, Q, R and S solutions.

Larutan <i>Solution</i>	I	II	III	IV
Nilai pH <i>pH value</i>	1	4	9	14

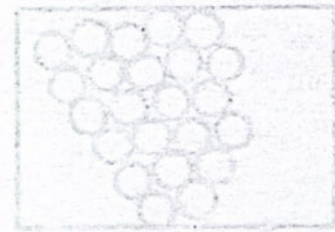
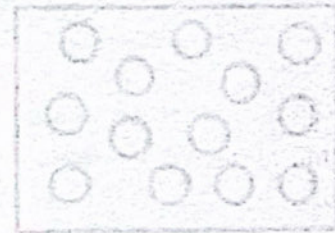
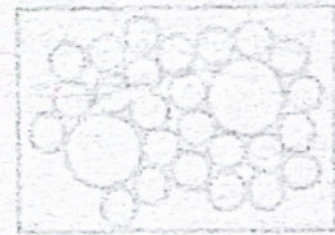
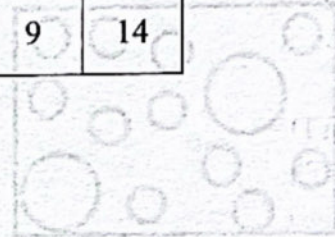
Jadual 1
Table 1

Larutan manakah yang merupakan alkali kuat?
Which solution is strong alkali?

- A I
- B II
- C III
- D IV

6. Antara berikut, yang manakah garam terlarutkan?
Which of the following is a soluble salt?

- A Barium sulfat
Barium sulphate
- B Kalsium sulfat
Calcium sulphate
- C Argentum sulfat
Silver sulphate
- D Plumbum(II) sulfat
Lead(II) sulphate



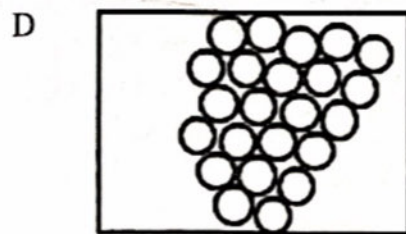
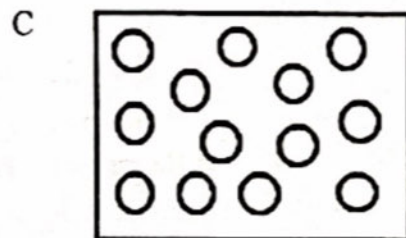
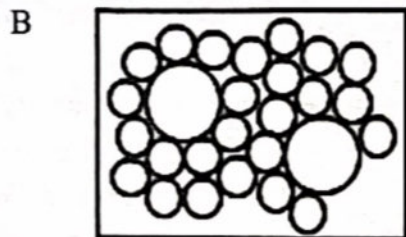
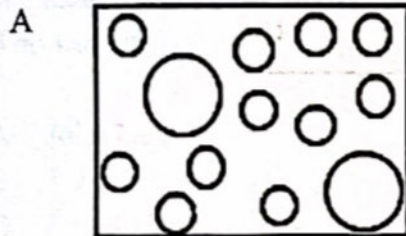
7. Tindak balas manakah yang mempunyai kadar tindak balas yang paling tinggi?

Which reaction has the highest rate of reaction?

- A Penapaian
Fermentation
- B Sel elektrik
Electric cell
- C Pengaratan
Rusting
- D Fotosintesis
Photosynthesis

8. Antara berikut, yang manakah menunjukkan susunan atom dalam aloi?

Which of the following shows the arrangement of the atoms in an alloy?



9. Antara berikut, yang manakah berlaku dalam tindak balas pengoksidaan?

Which of the following occurs in oxidation reaction?

- I Terima elektron
Gain of electron
 - II Terima oksigen
Gain of oxygen
 - III Terima hidrogen
Gain of hydrogen
 - IV Pertambahan nombor pengoksidaan
Increase in oxidation number
- A I dan II
I and II
 - B II dan IV
II and IV
 - C I dan III
I and III
 - D III dan IV
III and IV

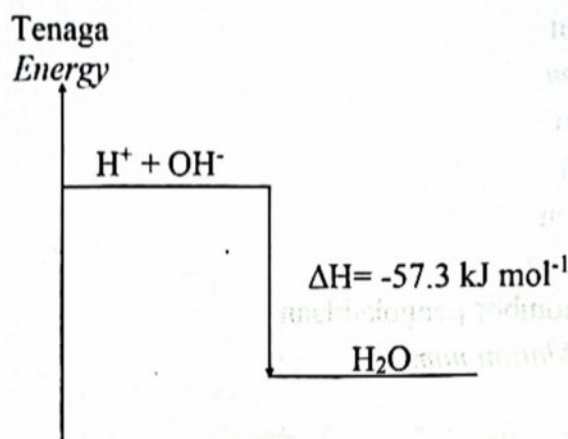
10. Apakah bahan yang terhasil apabila propana terbakar dalam oksigen berlebihan?

What are the products formed when propane is burnt in excess oxygen?

- I Air
Water
 - II Karbon
Carbon
 - III Karbon dioksida
Carbon dioxide
 - IV Karbon monoksida
Karbon monoxide
- A I dan II
I and II
 - B II dan IV
II and IV
 - C I dan III
I and III
 - D III dan IV
III and IV

11. Rajah 1 menunjukkan aras tenaga bagi satu tindak balas.

Diagram 1 shows an energy level of a reaction.



Rajah 1
Diagram 1

Apakah jenis tindak balas itu?

What is the type of the reaction?

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

12. Isoprena merupakan unit asas bagi polimer X. Apakah polimer X?

Isoprene is the basic unit of polymer X. What is polymer X?

- A Kanji
Starch
- B Protein
Protein
- C Getah asli
Natural rubber
- D Polivinil klorida
Polyvinyl chloride

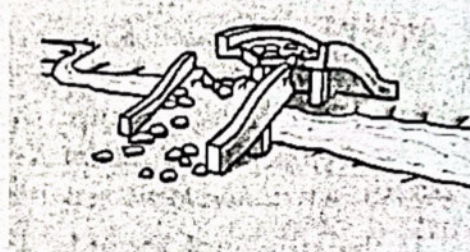
13. Antara bahan tambah dalam detergen berikut, yang manakah digunakan untuk menukar kotoran kepada bahan tanpa warna pada pakaian?

Which additive in detergent is used to change dirt into colourless substance on clothes?

- A Pemutih optik
Optical whitener
- B Agen pemutih
Whitening agent
- C Enzim biologi
Biological enzyme
- D Agen antienapan
Anti suspension agent

14. Rajah 2 menunjukkan sebuah jambatan yang rosak selepas enam bulan beroperasi.

Diagram 2 shows a damaged bridge after six months of operation.



Rajah 2
Diagram 2

Antara bahan-bahan berikut, yang manakah paling sesuai untuk membina semula struktur jambatan itu?

Which of these materials is the most suitable to rebuild the bridge structure?

- A Besi
Iron
- B Zink
Zinc
- C Keluli
Steel
- D Loyang
Brass



15. Apakah nama proses untuk menghasilkan alkohol daripada jus buah-buahan?

What is the name of the process to produce alcohol from fruit juice?

- A Penapaian
Fermentation
- B Pengesteran
Esterification
- C Pengoksidaan
Oxidation
- D Pendehidratan
Dehydration

16. Unsur R mempunyai takat didih 45 °C. Apakah keadaan fizik bagi unsur R pada suhu bilik?

Element R has a boiling point of 45 °C. What is the physical state of element R at room temperature?

- A Gas
Gas
- B Cecair
Liquid
- C Pepejal
Solid

17. Jisim formula relatif bagi $Y_3(PO_4)_2$ ialah 310. Tentukan jisim atom relatif bagi unsur Y.

[Jisim atom relatif: O = 16, P = 31]

The relative formula mass of $Y_3(PO_4)_2$ is 310. Find the relative atomic mass of element Y.

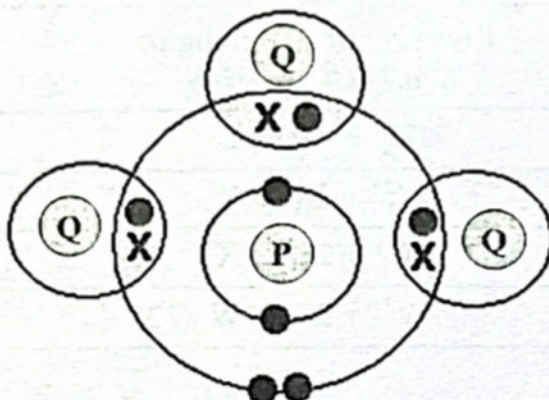
[Relative atomic mass: O = 16, P = 31]

- A 12
- B 23
- C 40
- D 65

20. Antara garam berikut, yang manakah boleh disediakan melalui kaedah penguraian ganda dua?
Which of the following salt can be prepared by the double decomposition method?
- A Magnesium sulfat
Magnesium sulphate
 - B Ammonium klorida
Ammonium chloride
 - C Kuprum(II) nitrat
Copper(II) nitrate
 - D Plumbum(II) iodida
Lead(II) iodide
21. Antara berikut, tindak balas yang manakah kadar tindak balasnya dapat ditentukan dengan mengukur perubahan isipadu gas per unit masa?
Which of the following reaction is the rate of reaction can be determined by measuring the change in volume of gas per unit time?
- A Kalsium karbonat dengan asid hidroklorik
Calcium carbonate with hydrochloric acid
 - B Larutan natrium hidroksida dengan asid sulfurik pekat
Sodium hydroxide solution with concentrated sulphuric acid
 - C Larutan kalium manganat(VII) berasid dengan butena
Acidified potassium manganate(VII) solution with butene
 - D Larutan kalsium nitrat dengan larutan natrium karbonat
Calcium nitrate solution with sodium carbonate solution
22. Antara berikut, yang manakah berlaku pada atom ferum apabila mengalami pengurangan?
Which of the following occurs to an iron atom when it undergoes rusting?
- A Kehilangan elektron
Loss of electron
 - B Menerima hidrogen
Gain hydrogen
 - C Kehilangan oksigen
Loss of oxygen
 - D Pengurangan nombor pengoksidaan
Decrease in oxidation number

23. Rajah 4 menunjukkan susunan elektron bagi sebatian yang terbentuk antara atom P dan atom Q.

Diagram 4 shows the electron arrangement of a compound formed between atom P and atom Q.



Rajah 4

Diagram 4

Antara pernyataan berikut, yang manakah benar mengenai sebatian tersebut?

Which of the following statement is true about the compound?

- A Sebatian tersebut tidak stabil
The compound is not stable
 - B Semua atom telah mencapai susunan elektron oktet
All atoms have achieved octet electron arrangement
 - C Atom Q berkongsi elektron valens dengan atom P
Q atoms share their valence electrons with P atom
 - D Sebatian terbentuk melalui pemindahan elektron
The compound is formed by transfer of electrons
24. Apakah nilai pH bagi larutan kalium hidroksida dengan kepekatan 0.1 mol dm^{-3} ?
- What is the pH value for potassium hydroxide solution with a concentration of 0.1 mol dm^{-3} ?
- A 1
 - B 10
 - C 13
 - D 14

25. Jadual 2 menunjukkan nilai keupayaan elektrod piawai bagi beberapa bahan yang digunakan untuk membina suatu sel kimia.

Table 2 shows the standard electrode potential values of a few substances that are used to build a chemical cell.

Persamaan sel setengah <i>Half cell equation</i>	E° (V)
$Z^{2+} + 2e^{-} \rightarrow Z$	- 0.14
$Y^{2+} + 2e^{-} \rightarrow Y$	- 0.44
$X^{2+} + 2e^{-} \rightarrow X$	- 0.76
$W^{2+} + 2e^{-} \rightarrow W$	- 2.38

Jadual 2
Table 2

Antara berikut, pasangan logam dan terminal manakah yang dipadankan dengan betul?
Which of the following pairs of metals and the terminals are matched correctly?

	Pasangan logam <i>Pairs of metal</i>	Terminal positif <i>Positive terminal</i>	Terminal negatif <i>Negative terminal</i>
A	W dan X <i>W and X</i>	W	X
B	X dan Y <i>X and Y</i>	X	Y
C	Y dan Z <i>Y and Z</i>	Y	Z
D	W dan Z <i>W and Z</i>	Z	W



26. Rajah 5 menunjukkan sebuah periuk.
Diagram 5 shows a pot.



Rajah 5
 Diagram 5

Apakah bahan S?
What is substance S?

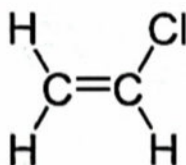
- A Kaca plumbum
Lead glass
- B Kaca soda kapur
Soda lime glass
- C Kaca borosilikat
Borosilicate glass
- D Kaca fotokromik
Photochromic glass

27. Antara berikut, langkah yang manakah perlu dilakukan untuk mendapatkan hasil penyaduran yang baik?
Which of the following steps should be taken to obtain good electroplating results?

- A Menggunakan arus voltan tinggi secara berterusan
Use high voltage continuously
- B Menggunakan elektrolit dengan kepekatan yang tinggi
Use electrolyte with high concentration
- C Putar objek yang ingin disadur sepanjang masa penyaduran dijalankan
Rotate object to be electroplated during the electroplating process
- D Menyambungkan objek yang ingin disadur pada terminal positif bateri
Connect the object to be electroplated at positive terminal of the battery

28. Rajah 6 menunjukkan formula struktur suatu monomer.

Diagram 6 shows a structural formula of a monomer.



Rajah 6
Diagram 6

Antara berikut, yang manakah persamaan antara monomer tersebut dengan polimernya?

Which of the following is the similarity between the monomer and its polymer?

- A Formula molekul ialah C_2H_3Cl
Molecular formula is C_2H_3Cl
 - B Bilangan atom karbon dalam molekul
Number of carbon atoms in the molecule
 - C Mempunyai ikatan ganda dua antara atom-atom karbon
Have double bond between carbon atoms
 - D Mempunyai atom karbon, atom hidrogen dan atom klorin
Contain carbon atom, hydrogen atom and chlorine atom
29. Seorang pesakit menunjukkan gejala dapat melihat atau mendengar perkara yang tidak nyata.
Antara ubat berikut, yang manakah sesuai diambil oleh pesakit tersebut?
A patient shows symptoms of seeing or hearing things that are not real.
Which of the following medicines is suitable to be taken by the patient?
- A Streptomisin
Streptomycin
 - B Antihistamin
Antihistamines
 - C Prednisolone
Prednisolone
 - D Klorpromazin
Chlorpromazine

30. Jadual 3 menunjukkan haba pembakaran bagi empat jenis alkohol.

Table 3 shows the heat of combustion for four types of alcohol.

Alkohol <i>Alcohol</i>	Formula molekul <i>Molecular formula</i>	Haba pembakaran, kJ mol ⁻¹ <i>Heat of combustion, kJ mol⁻¹</i>
W	CH ₃ OH	-710
X	C ₂ H ₅ OH	-1370
Y	C ₃ H ₇ OH	-2020
Z	C ₄ H ₉ OH	-2670

Jadual 3

Table 3

Antara berikut, pernyataan manakah yang menerangkan perbezaan nilai haba pembakaran dari alkohol W ke alkohol Z?

Which of the following statement explains the difference in heat of combustion from alcohol W to alcohol Z?

- A Panjang rantai karbon bertambah
Length of carbon chain increases
- B Bilangan atom karbon per molekul bertambah
Number of carbon atoms per molecule increases
- C Bilangan atom hidrogen per molekul bertambah
Number of hydrogen atoms per molecule increases
- D Bilangan molekul karbon dioksida dan air terhasil bertambah
The number of carbon dioxide and water molecules produced increases

31. Atom X mempunyai susunan elektron 2.8.7. Antara pernyataan berikut yang manakah benar mengenai X?

Atom X has an electron arrangement of 2.8.7. Which of the following statements about X are correct?

- I Terletak dalam Kumpulan 17 dalam Jadual Berkala Unsur
Located in Group 17 in the Periodic Table of Elements
- II Berada dalam Kala 3 dalam Jadual Berkala Unsur
is in Period 3 of the Periodic Table of Elements
- III Membentuk ion dengan cas -1
Forms an ion with a charge of -1
- IV Ialah sejenis logam
Is a type of metal

- A I, II dan III
I, II and III
- B I, II dan IV
I, II and IV
- C I, III dan IV
I, III and IV
- D I, II, III dan IV
I, II, III and IV

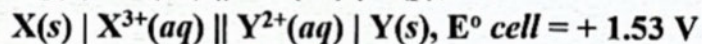
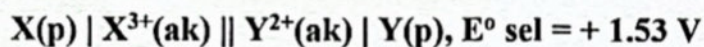
32. Tindak balas antara kalsium karbonat, CaCO_3 dan asid hidroklorik, HCl menghasilkan gas karbon dioksida. Jika eksperimen diulangi dengan menggunakan asid nitrik, HNO_3 dengan kepekatan dan isi padu yang sama, apakah yang akan berlaku?

The reaction between calcium carbonate, CaCO_3 and hydrochloric acid, HCl produces carbon dioxide gas. If the experiment is repeated using nitric acid, HNO_3 with the same concentration and volume, what will happen?

- A Kadar tindak balas bertambah
The rate of reaction increases
- B Kadar tindak balas berkurang
The rate of reaction decreases
- C Isi padu maksimum gas CO_2 berkurang
The maximum volume of CO_2 gas decrease
- D Kadar tindak balas dan isi padu maksimum gas sama
The rate of reaction and the maximum volume of gas are the same

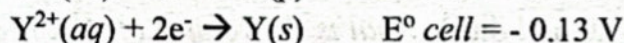
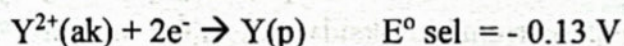
33. Maklumat berikut menunjukkan notasi sel dan nilai E° sel bagi sebuah sel kimia yang menggunakan logam X dan logam Y.

The following information shows the cell notation and E° cell value for a chemical cell that uses metal X and metal Y.



Diberi;

Given;



Tentukan nilai keupayaan elektrod piawai, E° bagi logam X.

Determine the value of the standard electrode potential, E° of metal X.

- A - 1.40 V
B - 1.66 V
C + 1.40 V
D + 1.66 V
34. 1.02 g unsur X bertindak balas dengan 0.8 g oksigen untuk menghasilkan sejenis oksida dengan formula empirik X_2O_5 . Tentukan jisim atom relatif bagi unsur X.

[Jisim atom relatif: O = 16]

1.02 g of element X reacts with 0.8 g of oxygen to form an oxide with empirical formula X_2O_5 .

Determine the relative atomic mass of element X.

[Relative atomic mass: O = 16]

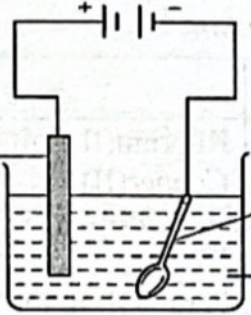
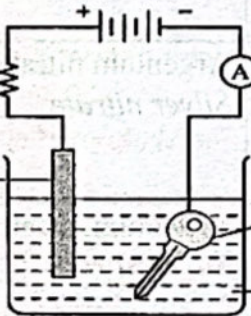
- A 31
B 51
C 55
D 56



35. Susunan elektron unsur X ialah 2.6. Unsur X bertindak balas dengan unsur Y bagi menghasilkan suatu sebatian kovalen dengan formula Y_2X . Nombor proton unsur Y ialah
The electron arrangement of element X is 2.6. The element X reacts with the element Y to form a covalent compound with formula Y_2X . The proton number of element Y could be
- A 11
B 14
C 15
D 17
36. Suatu asid diprotik, H_2X mempunyai kepekatan 1.0 mol dm^{-3} . Berapakah isi padu H_2X yang diperlukan untuk meneutralkan 50.0 cm^3 larutan natrium hidroksida, $NaOH \text{ } 0.5 \text{ mol dm}^{-3}$?
A diprotic acid, H_2X has a concentration of 1.0 mol dm^{-3} . What is the volume of H_2X needed to neutralise 50.0 cm^3 of 0.5 mol dm^{-3} sodium hydroxide solution, $NaOH$?
- A 12.5 cm^3
B 50.0 cm^3
C 25.0 cm^3
D 100.0 cm^3

37. Rajah 7 menunjukkan susunan radas bagi dua eksperimen.

Diagram 7 shows the apparatus sets up of two experiments.

Set	Susunan radas Arrangement of apparatus
I	 Kepingan kuprum Copper plate Sudu besi Iron spoon Larutan X Solution X
II	 Kepingan argenterum Silver plate Kunci besi Iron key Larutan Y Solution Y

Rajah 7

Diagram 7

Antara padanan berikut, yang manakah betul bagi jenis larutan yang digunakan dan pemerhatian di katod dalam setiap set?

Which of the following matches is correct for the types of solutions used and the observations at the cathode in each set?

	Larutan Solution		Pemerhatian Observation	
	X	Y	I	II
A	Argentum nitrat <i>Argentum nitrate</i>	Kuprum(II) sulfat <i>Copper(II) sulphate</i>	Pepejal perang terenap <i>Brown solid deposited</i>	Pepejal perang terenap <i>Brown solid deposited</i>
B	Kuprum(II) sulfat <i>Copper(II) sulphate</i>	Ferum(II) nitrat <i>Iron(II) nitrate</i>	Pepejal kelabu terenap <i>Brown solid deposited</i>	Pepejal perang terenap <i>Brown solid deposited</i>
C	Kuprum(II) sulfat <i>Copper(II) sulphate</i>	Argentum nitrat <i>Silver nitrate</i>	Pepejal perang terenap <i>Brown solid deposited</i>	Pepejal kelabu terenap <i>Grey solid deposited</i>
D	Ferum(II) nitrat <i>Iron(II) nitrate</i>	Argentum nitrat <i>Silver nitrate</i>	Pepejal perang terenap <i>Brown solid deposited</i>	Pepejal kelabu terenap <i>Grey solid deposited</i>

38. Berapakah jisim air yang terhasil apabila 2.1 g gas propena terbakar dengan lengkap dalam oksigen berlebihan?

[Jisim atom relatif: H = 1; C = 12; O = 16]

What is the mass of water produced when 2.1 g of propene gas is burnt completely in excess oxygen?

[Relative atomic mass: H=1; C= 12; O= 16]

- A 0.90 g
- B 2.70 g
- C 3.60 g
- D 5.40 g

39. Jadual 4 menunjukkan pemerhatian suatu eksperimen bagi oksida unsur P, Q dan R dalam Kala 3 bagi Jadual Berkala.

Table 4 shows the observations of an experiment for the oxides of element P, Q and R in Period 3 of the Periodic Table.

Oksida bagi unsur <i>Oxide of element</i>	Pemerhatian <i>Observation</i>	
	Asid <i>Acid</i>	Alkali <i>Alkali</i>
Oksida P <i>Oxide of P</i>	Larut membentuk larutan tidak berwarna. <i>Dissolve to form a colourless solution.</i>	Larut membentuk larutan tidak berwarna. <i>Dissolve to form a colourless solution.</i>
Oksida Q <i>Oxide of Q</i>	Tiada perubahan. <i>No change.</i>	Larut membentuk larutan tidak berwarna. <i>Dissolve to form a colourless solution.</i>
Oksida R <i>Oxide of R</i>	Larut membentuk larutan tidak berwarna. <i>Dissolve to form a colourless solution.</i>	Tiada perubahan. <i>No change.</i>

Jadual 4

Table 4

Antara berikut, yang manakah kedudukan yang betul bagi unsur P, Q dan R dalam Jadual Berkala?

Which of the following is the correct position of elements P, Q and R in the Periodic Table?

	Unsur P <i>Element P</i>	Unsur Q <i>Element Q</i>	Unsur R <i>Element R</i>
A	Kumpulan 1 <i>Group 1</i>	Kumpulan 13 <i>Group 13</i>	Kumpulan 17 <i>Group 17</i>
B	Kumpulan 13 <i>Group 13</i>	Kumpulan 1 <i>Group 1</i>	Kumpulan 17 <i>Group 17</i>
C	Kumpulan 17 <i>Group 17</i>	Kumpulan 1 <i>Group 1</i>	Kumpulan 13 <i>Group 13</i>
D	Kumpulan 13 <i>Group 13</i>	Kumpulan 17 <i>Group 17</i>	Kumpulan 1 <i>Group 1</i>

40. Jadual 5 menunjukkan maklumat tentang tiga set eksperimen menggunakan X g serbuk zink dengan asid sulfurik Y mol dm⁻³ berlebihan. Setiap set eksperimen menggunakan isipadu asid sulfurik yang berbeza dan ditambahkan dengan isipadu air yang berlainan.

Table 5 shows the information about three sets of experiments using X g of zinc powder with excess Y mol dm⁻³ of sulphuric acid. Each set of experiment uses different volumes of sulphuric acid and added with different volumes of water.

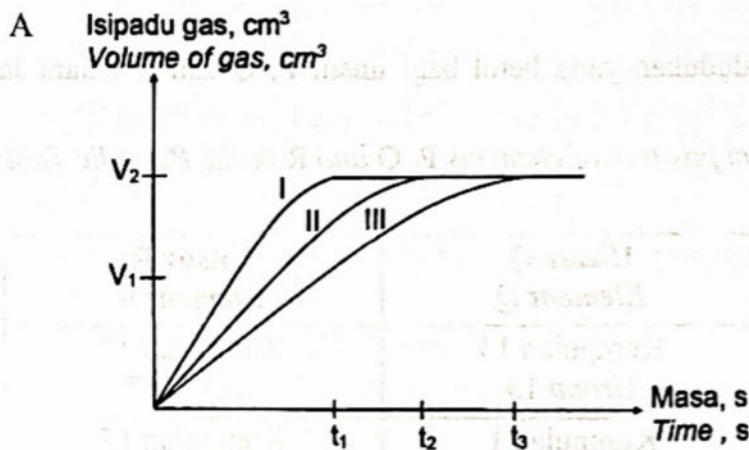
Set	Isipadu asid sulfurik, cm ³ Volume of sulphuric acid, cm ³	Isipadu air, cm ³ Volume of water, cm ³	Kehadiran mangkin Presence of catalyst
I	100	300	Ya Yes
II	400	0	Ya Yes
III	100	300	Tiada No

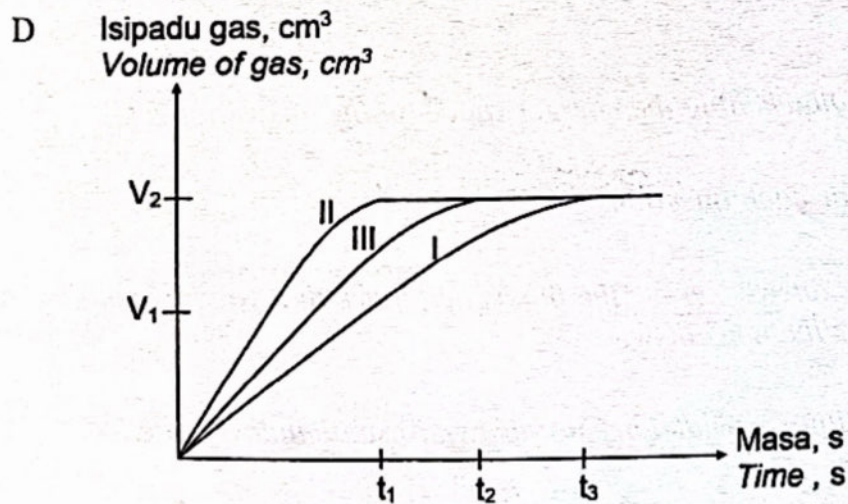
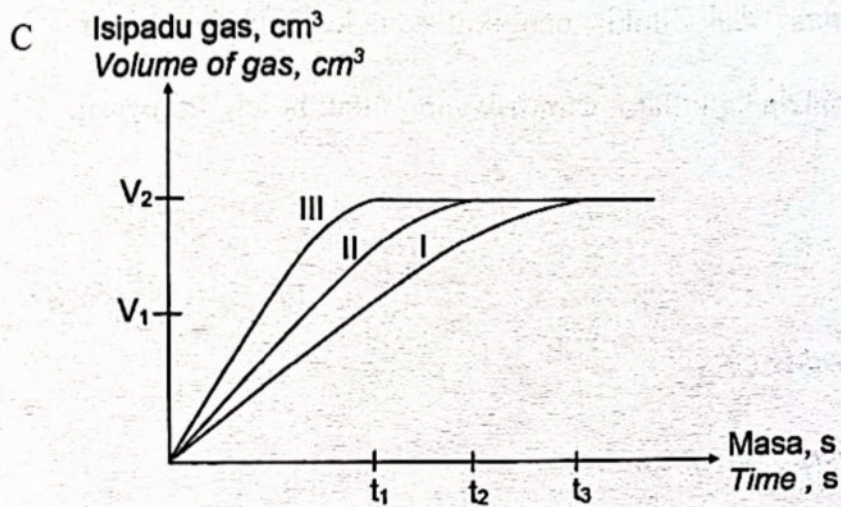
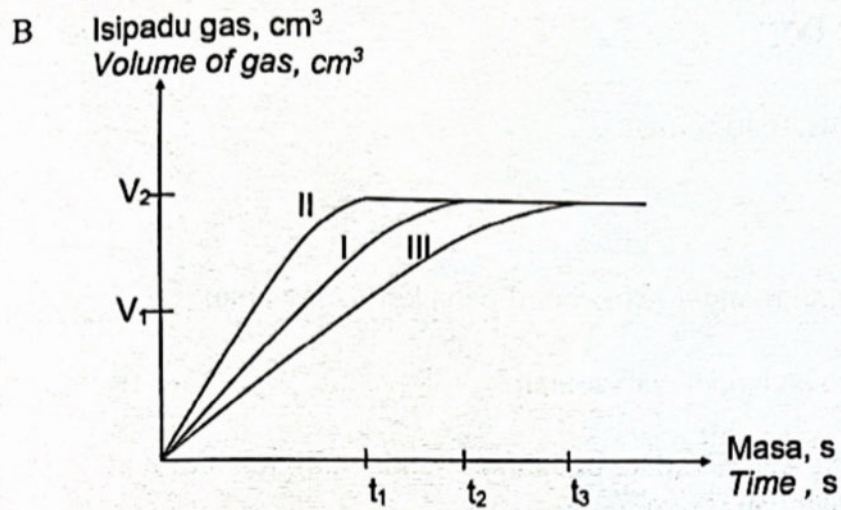
Jadual 5

Table 5

Berdasarkan Jadual 5, graf manakah yang menunjukkan lengkung yang betul bagi setiap set eksperimen?

Based on Table 5, which graph shows the correct curve for each set of experiments?





KERTAS SOALAN TAMAT
END OF QUESTION PAPER