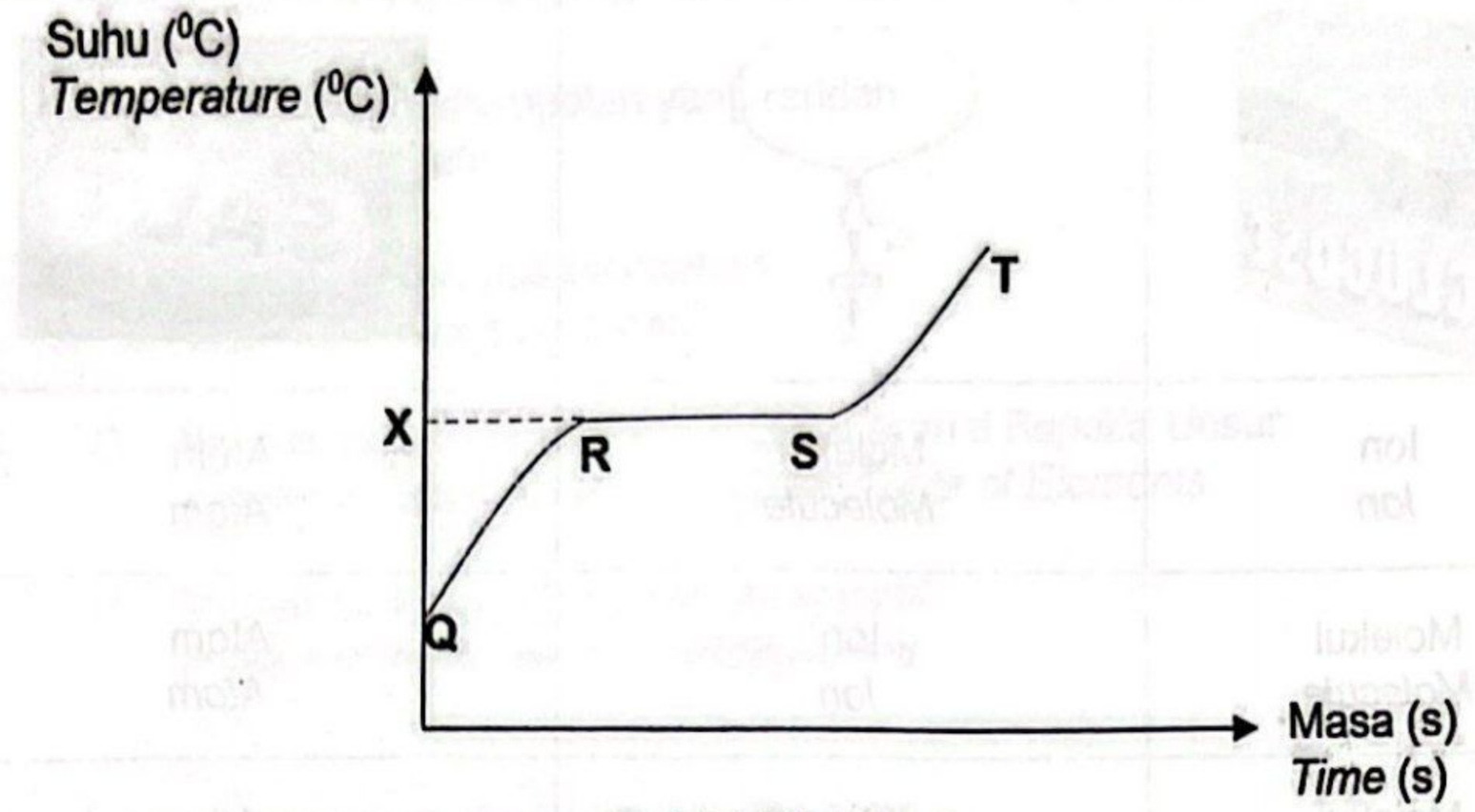
1 Rajah 1 menunjukkan satu lengkung perubahan keadaan jirim bagi pepejal Z.
Diagram 1 *shows a curve of change in the state of matter for solid* Z.



Rajah/ *Diagram* 1

Apakah takat X dan keadaan fizik Z dari R ke S?
What is the point X *and physical state* Z *from* R *to* S?

	Takat X *Point* X	Keadaan fizik Z *Physical state of* Z
A	Beku *Freezing*	Cecair *Liquid*
B	Lebur *Melting*	Pepejal *Solid*
C	Beku *Freezing*	Pepejal dan cecair *Solid and liquid*
D	Lebur *Melting*	Pepejal dan cecair *Solid and liquid*

2 Antara yang berikut, padanan manakah yang betul bagi setiap bahan dan jenis zarahnya?
Which of the following is the correct match of each substance and its type of particles?

			
A	Ion *Ion*	Molekul *Molecule*	Atom *Atom*
B	Molekul *Molecule*	Ion *Ion*	Atom *Atom*
C	Molekul *Molecule*	Atom *Atom*	Ion *Ion*
D	Atom *Atom*	Ion *Ion*	Molekul *Molecule*

3 Pernyataan berikut merujuk kepada sumbangan seorang ahli sains dalam membangunkan Jadual Berkala Unsur.
The following statement refer the contribution of scientist in developing Periodic Table of Element.

- Memplot graf isipadu atom melawan jisim atom unsur.
  Plotted the graph of the atomic volume against the atomic mass the elements.
- Unsur-unsur yang berada di kedudukan yang setara pada lengkung graf mempunyai sifat kimia yang serupa.
  Elements at equivalent positions on the curve of the graph had similar chemical properties.

Siapakah ahli sains itu?
Who was the scientist?

A Lothar Meyer

B Henry Moseley

C John Newlands

D Dmitri Mendelev

4 Gas helium mempunyai sifat lengai. Antara berikut, penerangan manakah yang betul mengenai sifat itu?
Helium gas had inert property. Which of the following statement is correct of the property?

A Mempunyai ketumpatan yang rendah
Has low density

B Wujud sebagai gas monoatom
Exists as monoatomic gas

C Berada dalam Kumpulan 18 dalam Jadual Berkala Unsur
Placed in Group 18 in the Periodic Table of Elements

D Mencapai susunan elektron yang stabil
Achieved stable electron arrangement

5 Antara berikut yang manakah sebatian ion?
Which of the following is an ionic compound?

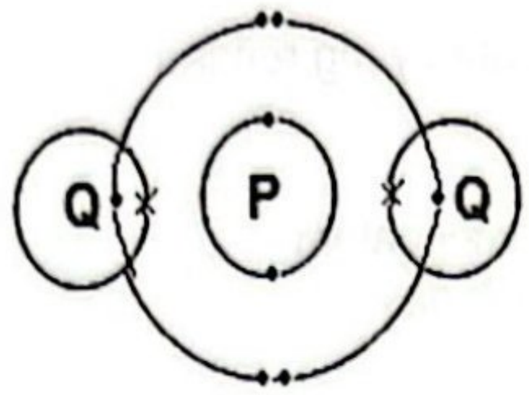
A Butana
Butane

B Glukosa
Glucose

C Kalsium oksida
Calsium oxide

D Silikon dioksida
Silicon dioxide

6 Rajah 6 menunjukkan susunan elektron dalam sebatian PQ_2.
Diagram 6 shows the electron arrangement in compound PQ_2.



Rajah/ *Diagram* 6

Unsur manakah yang diwakili oleh P dan Q?
[Proton number: H=1, C=6, O=8, Cl = 17]
Which elements are represented by P *and* Q?
[*Proton number*: H=1, C=6, O=8, Cl = 17]

	P	Q
A	Karbon *Carbon*	Oksigen *Oxygen*
B	Oksigen *Oxygen*	Hidrogen *Hydrogen*
C	Hidrogen *Hydrogen*	Klorin *Chlorine*
D	Karbon *Carbon*	Klorin *Chlorine*

7 Apakah ion yang terhasil apabila ion hidrogen berpadu dengan molekul air?
What ion is produced when a hydrogen ion combines with a water molecule?

A Ion oksida
Oxide ion

B Ion hidroksida
Hydroxide ion

C Ion ammonium
Ammonium ion

D Ion hidroksonium
Hydroxonium ion

8 Apakah maksud kebesan asid?
What does acid basicity mean?

A Bilangan ion hidrogen, H^+ yang boleh dihasilkan oleh satu molekul asid yang mengion di dalam air.
The number of hydrogen ions, H^+ *that can be produced by one molecule acid that ionizes in water.*

B Bilangan ion hidroksida, OH^- yang boleh dihasilkan oleh satu molekul asid yang mengion di dalam air.
The number of hydroxide ions, OH^- *that can be produced by one molecule acid that ionizes in water.*

C Bilangan ion ammonium, NH_4^+ yang boleh dihasilkan oleh satu molekul asid yang mengion di dalam air.
The number of ammonium ions, NH_4^+ *that can be produced by one molecule acid that ionizes in water.*

D Bilangan ion hidroksonium, H_3O^+ yang boleh dihasilkan oleh satu molekul asid yang mengion di dalam air.
The number of hydroxonium ions, H_3O^+ *that can be produced by one molecule acid that ionizes in water.*

9 Antara berikut yang manakah merupakan tindak balas perlahan?
Which of the following is a slow reaction?

I Tindak balas pemendakan
Precipitate reaction

II Tindak balas penapaian
Fermentation reaction

III Tindak balas pembakaran
Combustion reaction

IV Tindak balas pereputan
Decay reaction

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

10 Antara berikut yang manakah merupakan faktor yang mempengaruhi kadar tindak balas?
Which of the following is a factor that affects the rate of reaction?

A Suhu
Temperature

B Isipadu
Volume

C Bilangan mol
Number of mol

D Bilangan zarah
Number of particles

11 Maklumat berikut merupakan kegunaan bahan S.
The following information is about the uses of substance S.

- Cakera pemotong
  Cutting disc
- Cakera brek
  Brake disc
- Cincin karbida tungsten
  Tungsten carbide ring

Apakah bahan S?
What is substance S?

A Superkonduktor
Superconductor

B Seramik termaju
Advanced ceramics

C Seramik tradisional
Traditional ceramics

D Konkrit diperkukuhkan
Reinforced concrete

12 Bahan T mempunyai sifat seperti berikut:
Substance T has the following properties:

- Kekuatan regangan tinggi
  High stretching strength
- Penebat haba dan elektrik
  Heat and electrical insulator
- Tahan kakisan
  Resistant to corrosion
- Tahan lasak
  Durable

Nyatakan kegunaan T?
What is the use of T?

A Topi keledar
Helmet

B Kamera video
Video camera

C Kanta kamera
Camera lens

D Perkabelan rangkaian komputer
Cables in computer network

13 Apakah yang dimaksudkan dengan konduktor?
What is meant by conductor?

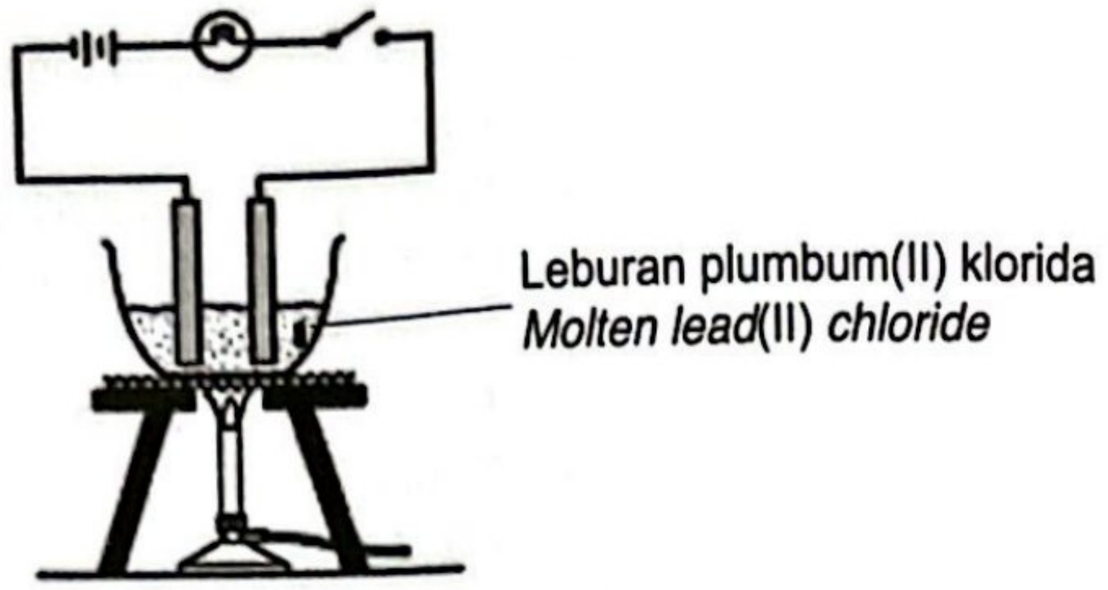
A Bahan yang mengalirkan arus elektrik dalam semua keadaan
A substance that conducts electricity under all conditions

B Bahan yang mengalirkan arus elektrik dan mengalami penguraian kepada juzuk-juzuknya
A substance that conducts an electric current and breaks down into its constituents

C Bahan yang mengkonduksikan elektrik dalam keadaan pepejal atau leburan tetapi tidak mengalami perubahan kimia
A substance that conducts electricity in a solid or molten state but does not undergo a chemical change

D Bahan yang dapat mengalirkan arus elektrik dalam keadaan lebur atau larutan akueus dan mengalami perubahan kimia
A substance that can conduct an electric current in a molten state or an aqueous solution and undergoes a chemical change

14 Rajah 14 menunjukkan suatu sel ringkas.
Diagram 14 *shows a simple cell.*



Rajah/ *Diagram* 14

Apakah anion yang hadir di dalam elektrolit?
What anion are present in the electrolyte?

A H^+

B Pb^{2+}

C OH^-

D Cl^-

15 Apakah hasil yang terbentuk apabila hidrogen dan propena dilalukan ke atas mangkin nikel pada suhu 180°C?
What is the product formed when hydrogen and propene are passed over a nickel catalyst at temperature 180°C?

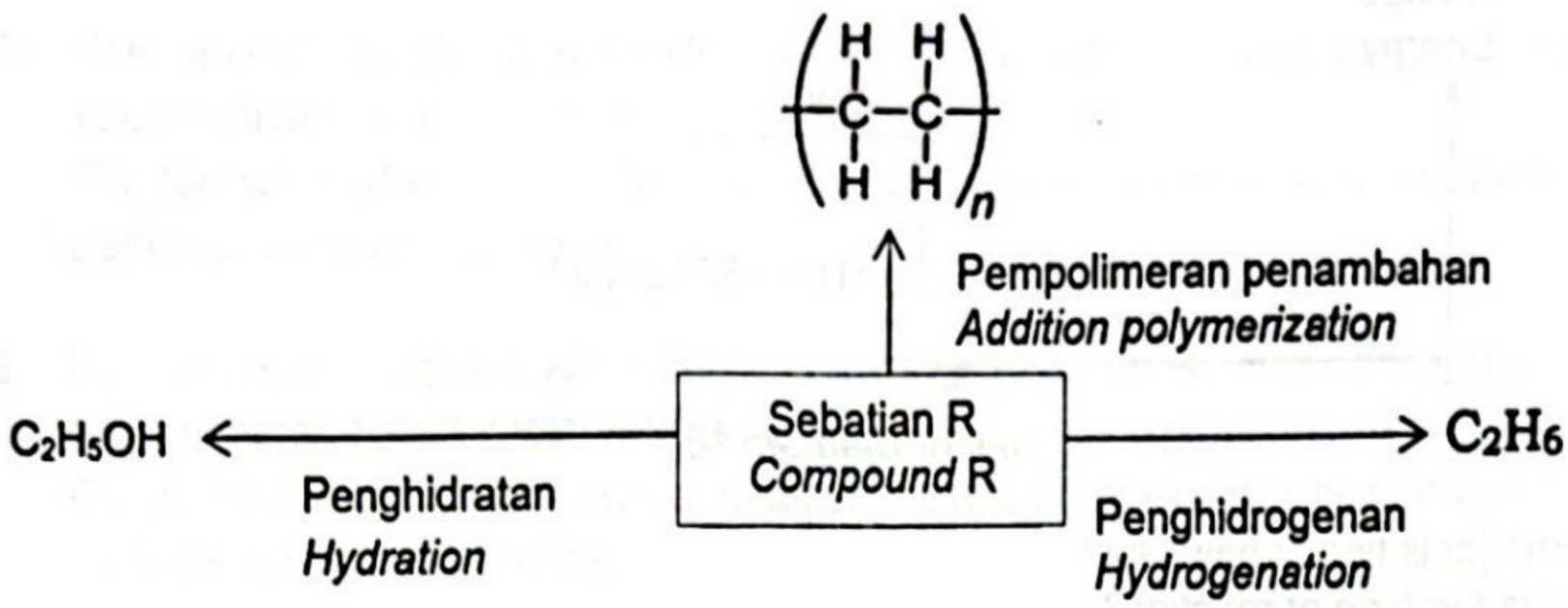
A Propana
Propane

B Propanol
Propanol

C Asid propanoik
Propanoic acid

D Propil propanoat
Propyl propanoate

16 Rajah 16 menunjukkan carta alir bagi tindak balas sebatian R.
Diagram 16 *shows a flow chart for the reactions of compound* R.



Rajah/ *Diagram* 16

Apakah formula am bagi R?
What is the general formula of R?

A C_nH_{2n}

B C_nH_{2n+2}

C $C_nH_{2n+1}OH$

D $C_nH_{2n+1}COOH$

17 Rajah 17 menunjukkan persamaan termokimia bagi asid dan alkali adalah seperti di bawah:
Diagram 17 *show the thermochemical equation of acids and alkalis are given as below:*

$HCl + NaOH \rightarrow NaCl + H_2O \quad \Delta H = -57\ kJ\ mol^{-1}$

$CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O \quad \Delta H = -55\ kJ\ mol^{-1}$

Rajah/ *Diagram* 17

Haba peneutralan bagi HCl adalah lebih tinggi kerana
Heat of neutralisation of HCl *is higher because*

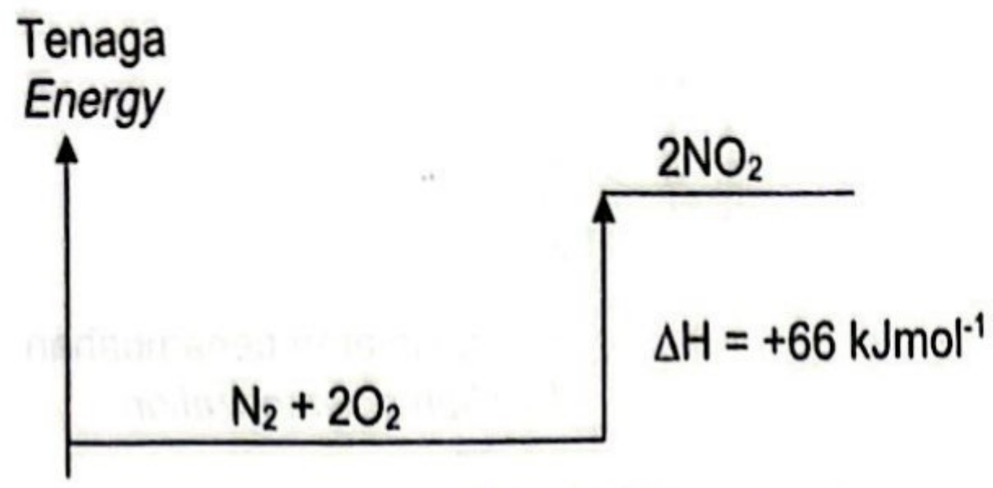
A HCl adalah asid kuat
HCl *is a strong acid*

B HCl adalah asid monoprotik
HCl *is monoprotic acid*

C CH_3COOH adalah asid kuat
CH_3COOH *is strong acid*

D CH_3COOH adalah asid diprotik
CH_3COOH *is diprotic acid*

18 Rajah 18 ialah gambar rajah aras tenaga bagi satu tindak balas.
Diagram 18 is an energy level diagram of a reaction.



Rajah/ *Diagram* 18

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

A Eksotermik
Exothermic

B Endotermik
Endothermic

C Penurunan
Reduction

D Penambahan
Addition

19 Antara berikut, polimer manakah terhasil daripada tindakbalas pempolimeran kondensasi?
Among the following, which polymer results from a condensation polymerization reaction?

A Terilena
Terylene

B Polietena
Polyethene

C Polivinil klorida
Polyvinyl chloride

D 1,2- etanadiol
1,2- *ethanediol*

20 Apakah yang menyebabkan getah tervulkan lebih kenyal dan tahan haba berbanding getah tak tervulkan?
What makes vulcanized rubber more elastic and heat resistant than unvulcanized rubber?

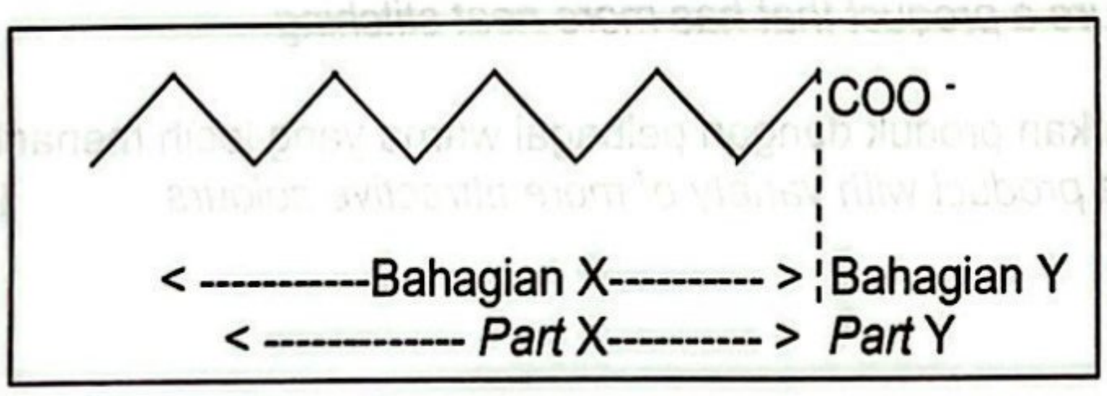
A Pembentukan rangkai silang sulfur mengurangkan ikatan kovalen tunggal antara karbon dalam getah tervulkan
The formation of sulfur crosslinks reduces the single covalent bonds between carbons in vulcanized rubber

B Pembentukan rangkai silang sulfur mengurangkan ikatan kovalen ganda dua antara karbon dalam getah tervulkan
The formation of sulfur crosslinks reduces the double covalent bonds between carbons in vulcanized rubber

C Pembentukan rangkai silang sulfur mengurangkan ikatan kovalen ganda dua antara karbon dengan atom sulfur dalam getah tervulkan
The formation of sulfur crosslinks reduces the double covalent bond between carbon and sulfur atoms in vulcanized rubber

D Pembentukan rangkai silang sulfur mengurangkan ikatan kovalen ganda dua antara sulfur dalam getah tervulkan
The formation of sulfur crosslinks reduces the double covalent bond between sulfur in vulcanized rubber

21 Rajah 21 menunjukkan struktur ion sabun.
Diagram 21 shows the structure of a soap ion.



Rajah/ *Diagram* 21

Berdasarkan Rajah, pernyataan yang manakah betul?
Based on Diagram, which of the following statements is true?

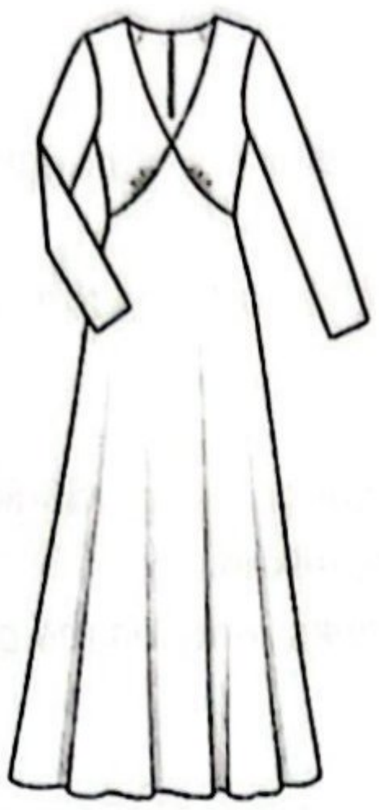
A Bahagian X dan Y terlarutkan dalam air
Parts X *and* Y *are soluble in water*

B Bahagian X dan Y terlarutkan dalam gris
Parts X *and* Y *are soluble in grease*

C Bahagian X terlarutkan dalam gris dan bahagian Y terlarutkan dalam air
Parts X *is soluble in grease and part* Y *are soluble in water*

D Bahagian X terlarutkan dalam air dan bahagian Y terlarutkan dalam gris
Parts X *is soluble in water and part* Y *is soluble in grease*

22 Rajah 22 menunjukkan sejenis produk daripada sebuah kilang.
Diagram 22 shows a type of product from a factory.



Rajah/ *Diagram* 22

Antara yang berikut, pernyataan manakah yang paling baik menerangkan bagaimana aplikasi teknologi nano dapat meningkatkan kualiti produk tersebut?
Which of the following statements best explains how the application of nanotechnology can enhance the quality of the product?

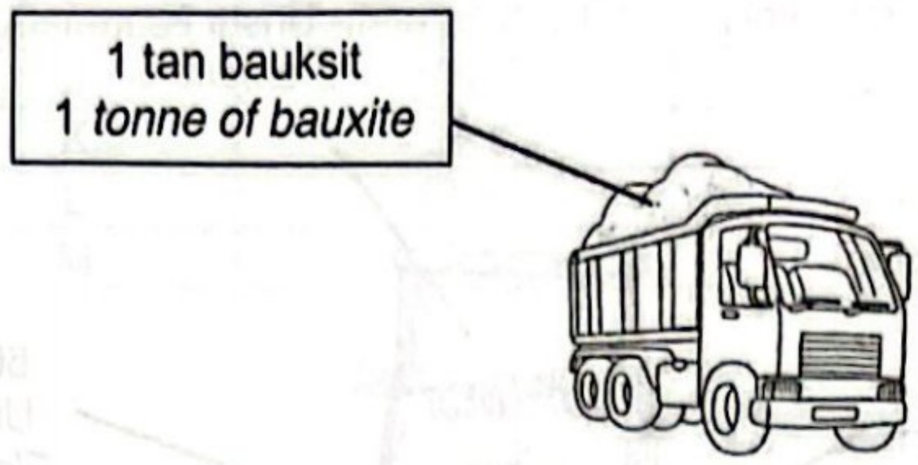
A Menjadikan produk bersifat anti kedut
Make a product with anti-wrinkles property

B Memastikan produk yang mudah meregang
Ensure a product that is easily stretchable

C Menghasilkan produk yang lebih kemas jahitannya
Manufacture a product that has more neat stitching

D Mengeluarkan produk dengan pelbagai warna yang lebih menarik
Produce a product with variety of more attractive colours

23 Rajah 23 menunjukkan sebuah lori membawa bauksit ke kilang untuk mengestrak aluminium daripada bijihnya.
Figure 23 shows a lorry carrying bauxite to the factory to extract aluminum from its ore.



Rajah/ *Diagram* 23

Persamaan berikut mewakili tindak balas pengekstrakan aluminium
The following equation represents the reaction extraction of aluminium.

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

Apakah jisim aluminium yang diekstrak?
What is the mass of aluminium extracted?
[Jisim atom relatif: O = 16, Al = 27; 1 tan = 1000 kg]
[*Relative atomic mass*: O = 16, Al = 27;1 tonne = 1000 kg]

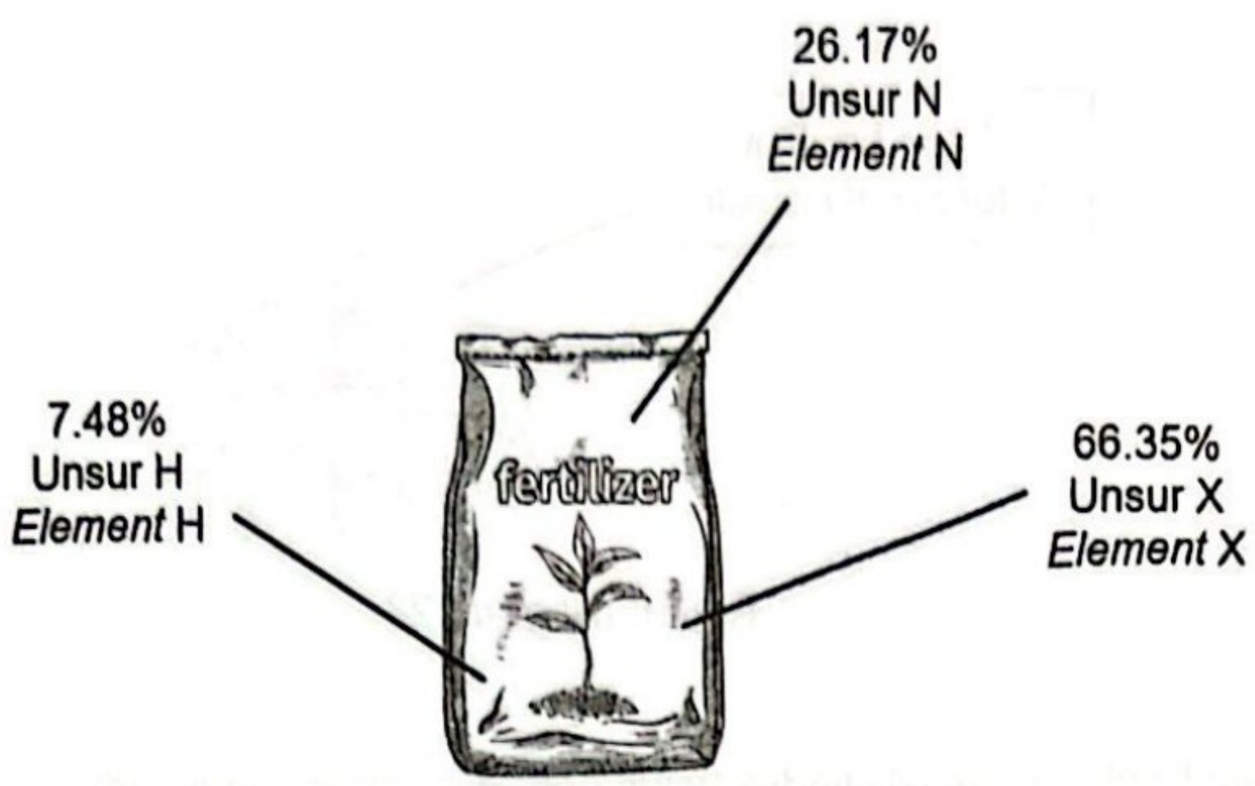
A 235 kg

B 264 kg

C 529 kg

D 1058 kg

24 Rajah 24 menunjukkan peratusan komposisi jisim untuk baja R.
Diagram 24 show the percentage of mass composition of fertiliser R.



Rajah/ *Diagram* 24

Baja R dihasilkan daripada tindak balas antara asid HX dan gas ammonia. Berapakah jisim gas ammonia yang diperlukan untuk menghasilkan 17.665 g baja R?
Fertiliser R *is produced from the reaction between* HX *acid and ammonia gas. What is the mass of ammonia gas needed to produce* 17.665 g *of fertiliser* R?

[Jisim atom relatif: H =1, N = 14, X = 35.5]
[*Relative atomic mass*: H =1, N = 14, X = 35.5]

A 1.51 g

B 1.60 g

C 5.61 g

D 5.96 g

25 Jadual 25 menunjukkan takat lebur dan takat didih bahan J, K, L dan M.
Table 25 shows melting point and boiling point of substances J, K, L *and* M.

Bahan *Substances*	Takat lebur (^{0}C) *Melting point* (^{0}C)	Takat didih (^{0}C) *Boiling point* (^{0}C)
J	-101.0	- 35.0
K	- 94.0	65.0
L	17.8	290.0
M	97.8	883.0

Jadual/ *Table* 25

Bahan manakah yang akan berubah daripada cecair kepada pepejal apabila diletakkan di dalam peti ais yang bersuhu 2.0^{0}C?
Which substance that will change from liquid to solid when placed in the freezer at temperature 2.0^{0}C?

A J

B K

C L

D M

26 Jadual 26 menunjukkan tiga unsur dan susunan elektron masing-masing. Huruf yang digunakan bukan simbol sebenar bagi unsur itu.
Table 26 shows three elements and their electron arrangement respectively. The letters used are not the actual symbol of the elements.

Unsur *Element*	Susunan elektron *Electron arrangement*
P	2.8.1
Q	2.8.4
R	2.8.7

Jadual/*Table* 26

Antara yang berikut, yang manakah betul tentang ketiga-tiga unsur itu mengikut urutan P, Q dan R?
Which of the following is correct about the three elements according to the sequence, P, Q *and* R?

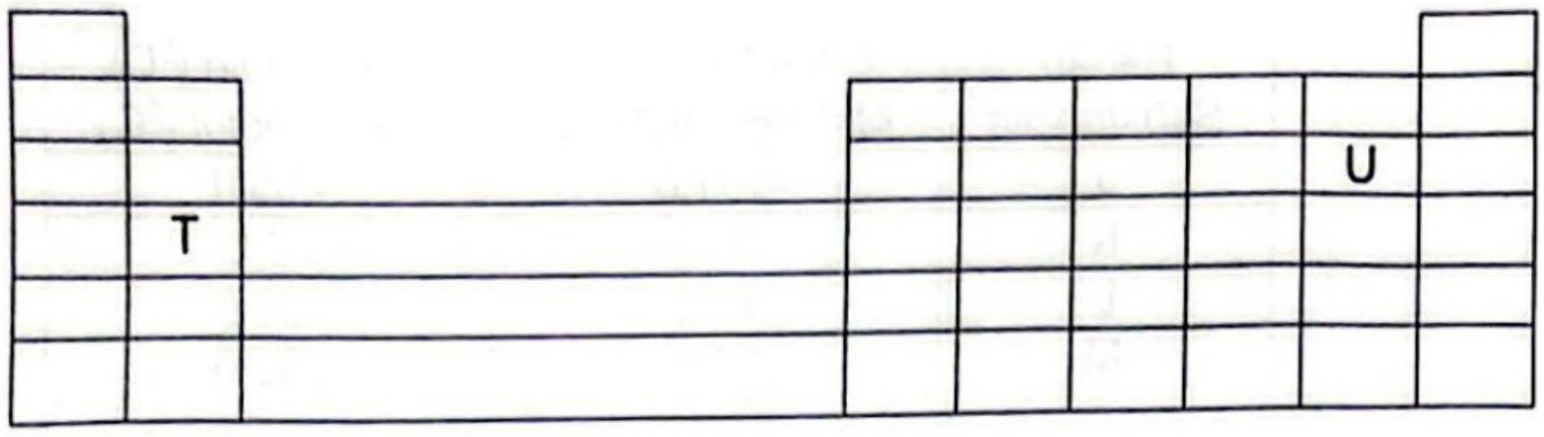
A Jejari atom bertambah
Atomic radius decreases

B Takat lebur bertambah
Melting point increases

C Sifat kelogaman bertambah
Metallic properties increases

D Keelektronegatifan bertambah
Electronegativity decreases

27 Rajah 27 menunjukkan kedudukan unsur T dan U di dalam Jadual Berkala Unsur.
Diagram 27 shows the position of element of T *and* U *in the Periodic Table of Element.*



Rajah/ *Diagram 27*

Manakah antara berikut merupakan formula kimia bagi sebatian yang terbentuk apabila unsur T bertindak balas dengan unsur U?
Which of the following is the formula of compound formed when element T *reacts with element* U?

A TU_2

B T_2U

C T_2U_3

D T_3U_2

28 Berapakah nilai pH bagi larutan kalium hidroksida, KOH yang mengandungi kepekatan ion hidroksida, OH^- 0.1 mol dm^{-3}?
How much is the pH *value of a solution of potassium hydroxide,* KOH *that contains a concentration of hydroxide ions,* OH^- 0.1 mol dm^{-3}?

A 14

B 13

C 10

D 1

29 Garam X terurai apabila dipanaskan dengan kuat. Gas perang terbebas dan menukarkan warna kertas litmus biru lembap kepada merah. Baki pemanasan berwarna kuning semasa panas dan berwarna putih setelah sejuk.
Apakah garam X?
Salt X *decomposes when heated strongly. Brown gas is liberated and changes the color of the moist blue litmus paper to red. Heating residue is yellow when hot and white when cool.*
What is salt X?

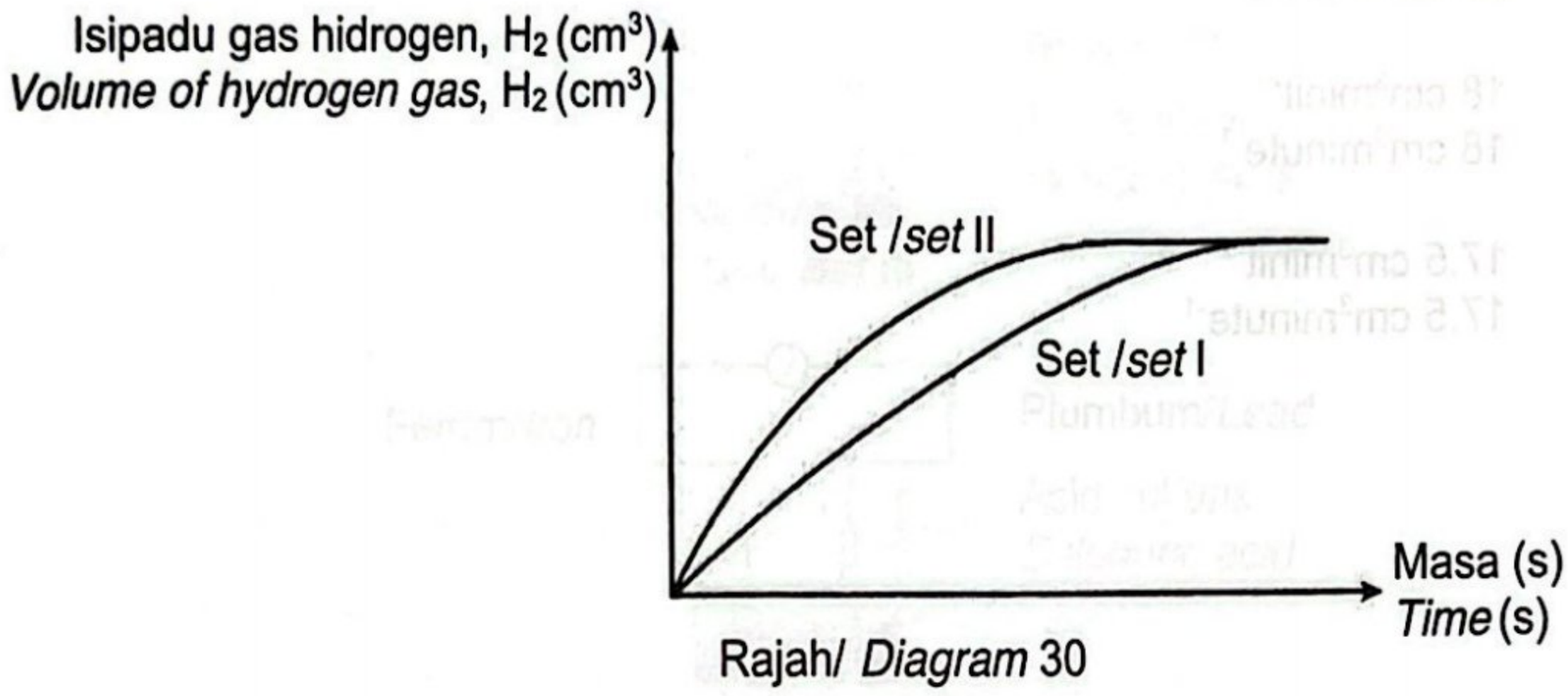
A $ZnCO_3$

B $PbCO_3$

C $Pb(NO_3)_2$

D $Zn(NO_3)_2$

30 Rajah 30 menunjukkan graf isipadu gas melawan masa bagi dua eksperimen, I dan II.
Diagram 30 *shows the graph of gas volume against time for two experiments*, I *and* II.



Rajah/ *Diagram* 30

Dalam eksperimen set I, 5.0 g ketulan zink bertindak balas dengan 25.00 cm^3 asid etanoik pada suhu dan tekanan bilik.
Apakah perubahan yang perlu dilakukan ke atas bahan tindak balas di dalam eksperimen set II?
In experiment set I, 5.0 g *of zinc lumps react with* 25.00 cm^3 *of ethanoic acid at room temperature and pressure.*
What changes should be made to the reactants in experiment set II?

A Meningkatkan saiz zink
Increase the size of zinc

B Tambah Nikel sebagai mangkin
Add nickel as a catalyst

C Menambah isipadu asid etanoik
Increase the volume of ethanoic acid

D Menggantikan asid etanoik dengan asid hidroklorik.
Replace ethanoic acid with hydrochloric acid

31 Jadual 31 menunjukkan isipadu gas yang terkumpul apabila magnesium karbonat bertindak balas dengan asid sulfurik.
Table 31 *shows the volume of gas that accumulates when magnesium carbonate reacts with sulfuric acid.*

Masa(minit) *Time(minute)*	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Isi padu gas (cm^3) *Volume of gas* (cm^3)	0.0	25.0	40.0	51.0	58.0	63.0	68.0	70.0	70.0

Jadual/*Table* 31

Berapakah kadar tindak balas purata dalam dua minit pertama?
What is the average rate of reaction in the first two minutes?

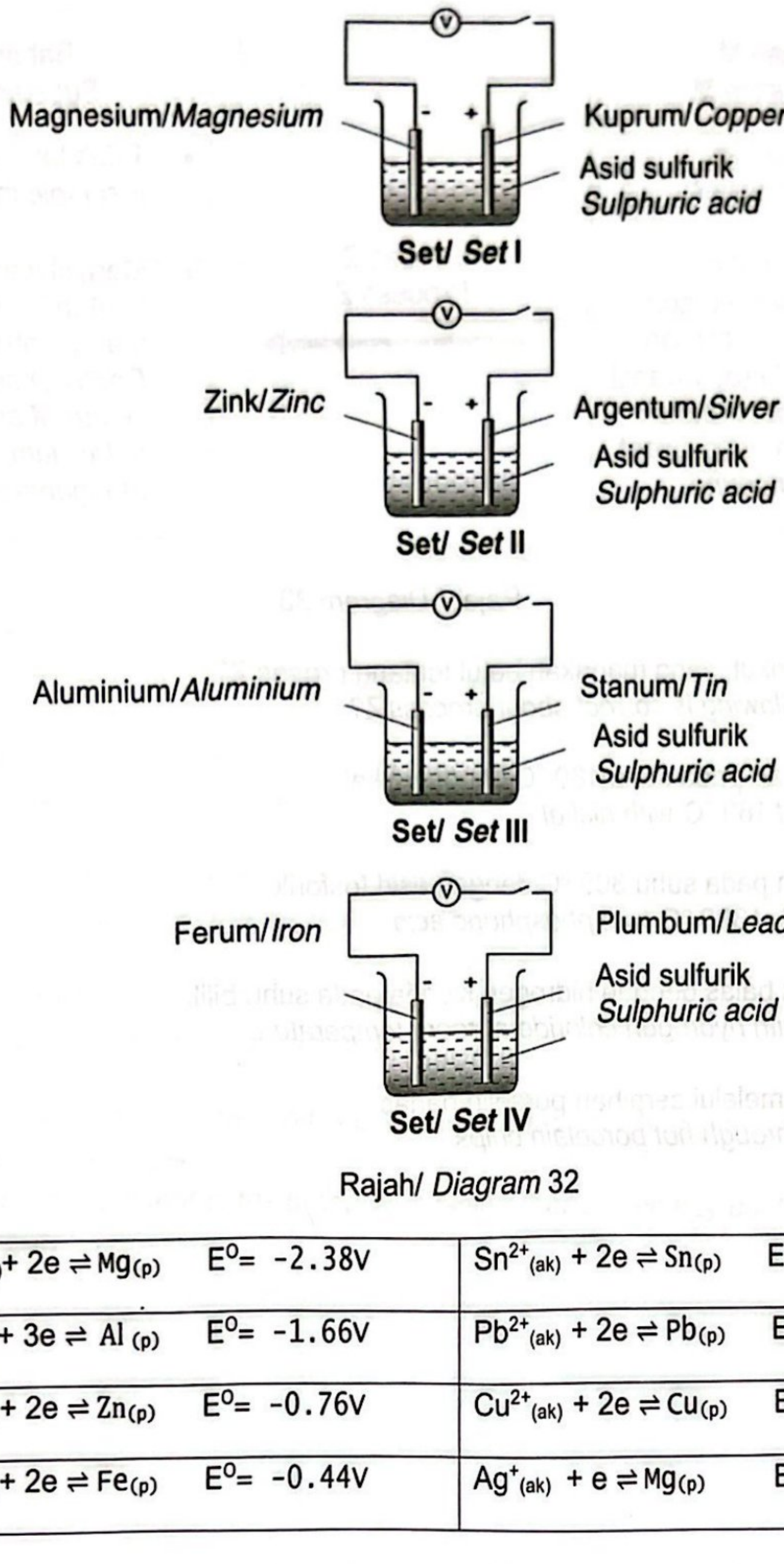
A 29 cm^3minit^{-1}
29 $cm^3minute^{-1}$

B 20 cm^3minit^{-1}
20 $cm^3minute^{-1}$

C 18 cm^3minit^{-1}
18 $cm^3minute^{-1}$

D 17.5 cm^3minit^{-1}
17.5 $cm^3minute^{-1}$

32 Rajah 32 menunjukkan susunan radas bagi empat sel kimia.
Diagram 32 shows the apparatus set-up for four chemical cells.



Rajah/ *Diagram* 32

$Mg^{2+}_{(ak)} + 2e \rightleftharpoons Mg_{(p)}$	$E^{O} = -2.38V$	$Sn^{2+}_{(ak)} + 2e \rightleftharpoons Sn_{(p)}$	$E^{O} = -0.14V$
$Al^{3+}_{(ak)} + 3e \rightleftharpoons Al_{(p)}$	$E^{O} = -1.66V$	$Pb^{2+}_{(ak)} + 2e \rightleftharpoons Pb_{(p)}$	$E^{O} = -0.13V$
$Zn^{2+}_{(ak)} + 2e \rightleftharpoons Zn_{(p)}$	$E^{O} = -0.76V$	$Cu^{2+}_{(ak)} + 2e \rightleftharpoons Cu_{(p)}$	$E^{O} = +0.34V$
$Fe^{2+}_{(ak)} + 2e \rightleftharpoons Fe_{(p)}$	$E^{O} = -0.44V$	$Ag^{+}_{(ak)} + e \rightleftharpoons Mg_{(p)}$	$E^{O} = +0.80V$

Antara berikut yang manakah memberikan nilai bacaan voltan sel yang paling tinggi?
Which of the following gives the highest cell voltage reading?

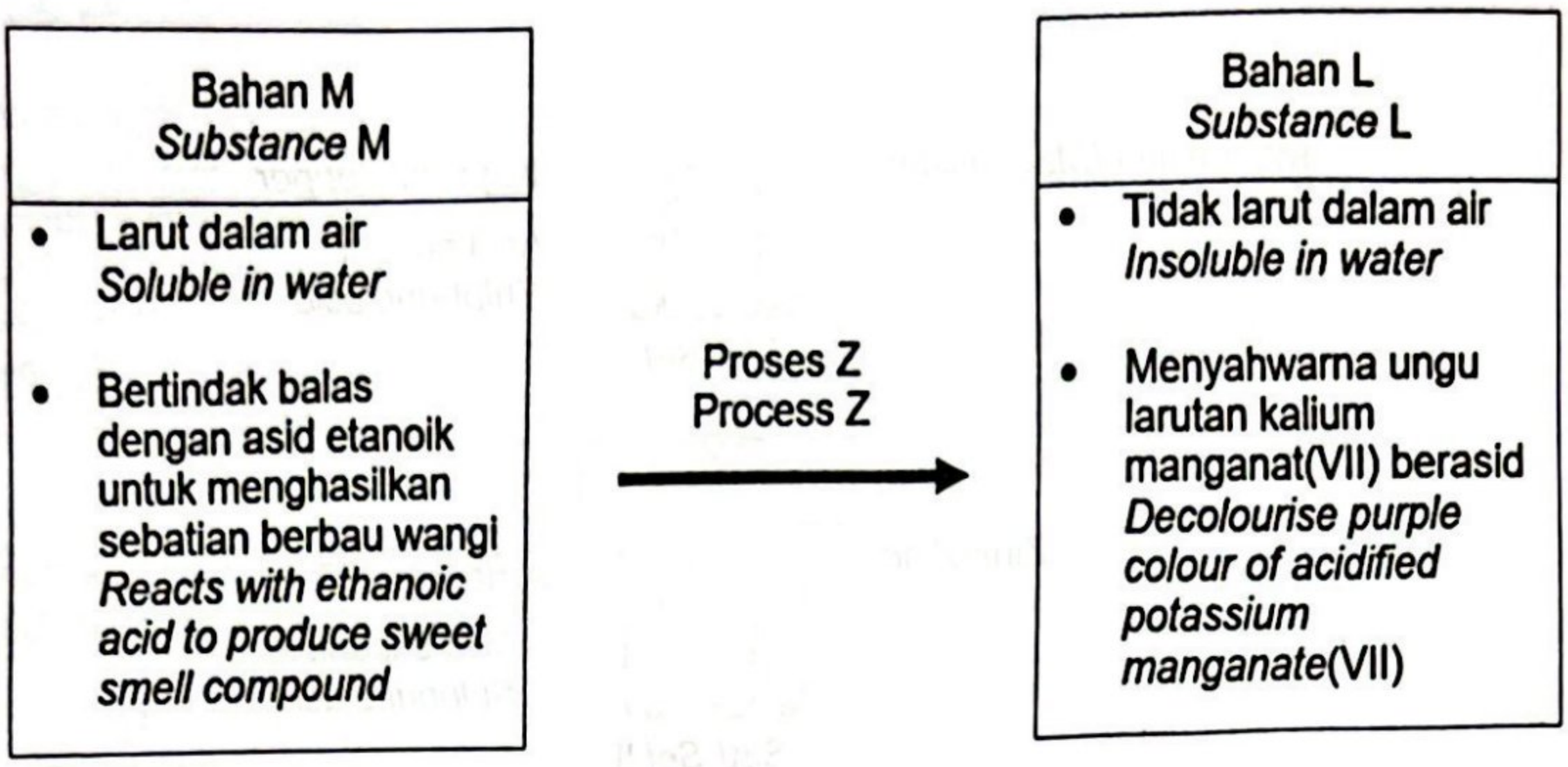
A Set I

B Set II

C Set III

D Set IV

33 Rajah 33 menunjukkan perubahan bahan M kepada bahan L melalui proses Z.
Diagram 33 *shows the change of substance* M *to substance* L *through process* Z.



Rajah/ *Diagram* 33

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

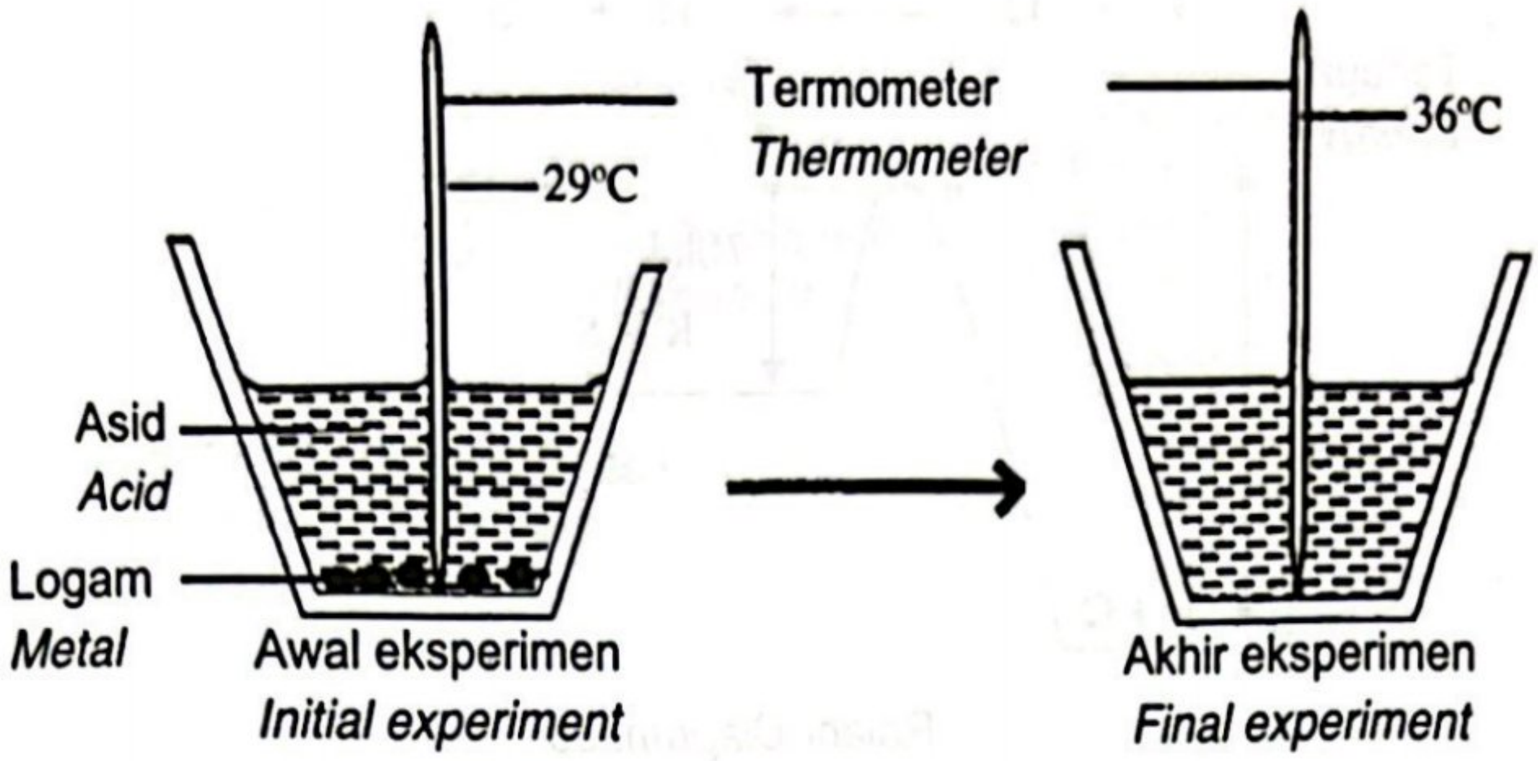
A Dipanaskan pada suhu 180 °C dengan nikel
Heated at 180 °C *with nickel*

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

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

D Dialirkan melalui serpihan porselin panas
Passes through hot porcelain chips

34 Rajah 34 menunjukkan susunan radas untuk menentukan haba tindak balas.
Diagram 34 shows the setup of apparatus for the determination of heat of reaction.



Rajah/ *Diagram* 34

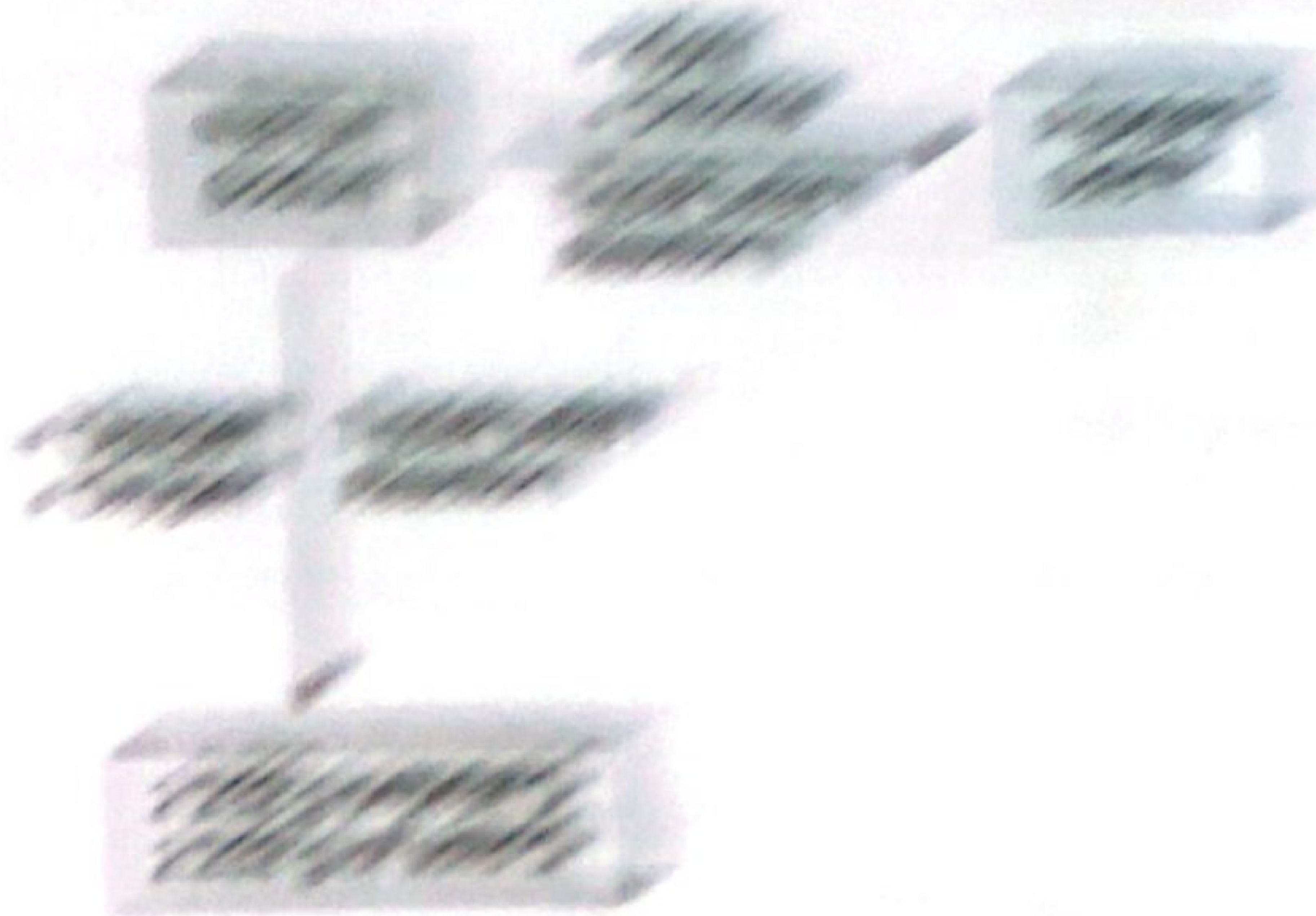
Antara pernyataan berikut manakah benar?
Which of the following statements is true?

A Proses pemecahan ikatan berlaku.
The process of bond breaking occurs.

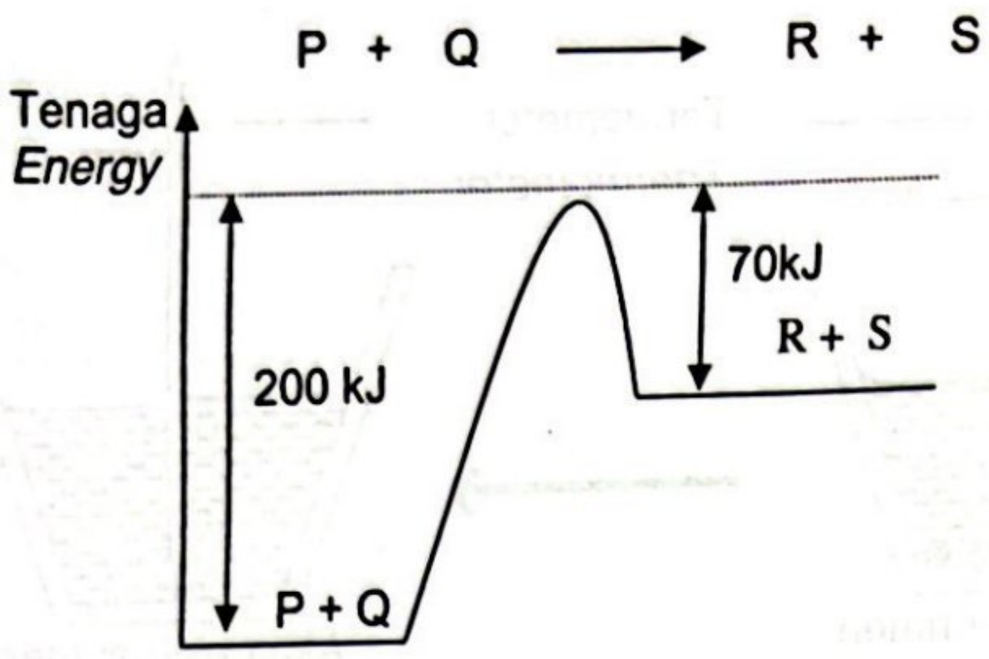
B Suhu meningkat semasa tindak balas berlaku.
The temperature increases during the reaction.

C Nilai ΔH dalam tindak balas ini adalah positif
The value of ΔH for the reaction is positive.

D Kandungan tenaga hasil tindak balas lebih tinggi daripada kandungan tenaga bahan tindak balas.
The energy content of the products is higher than the energy content of the reactants.



35 Rajah 35 menunjukkan gambar rajah aras tenaga bagi tindak balas kimia berikut.
Diagram 35 shows the energy level diagram of the following chemical reaction.



Rajah/ *Diagram* 35

Antara pernyataan berikut yang manakah benar?
Which of the following statements is true?

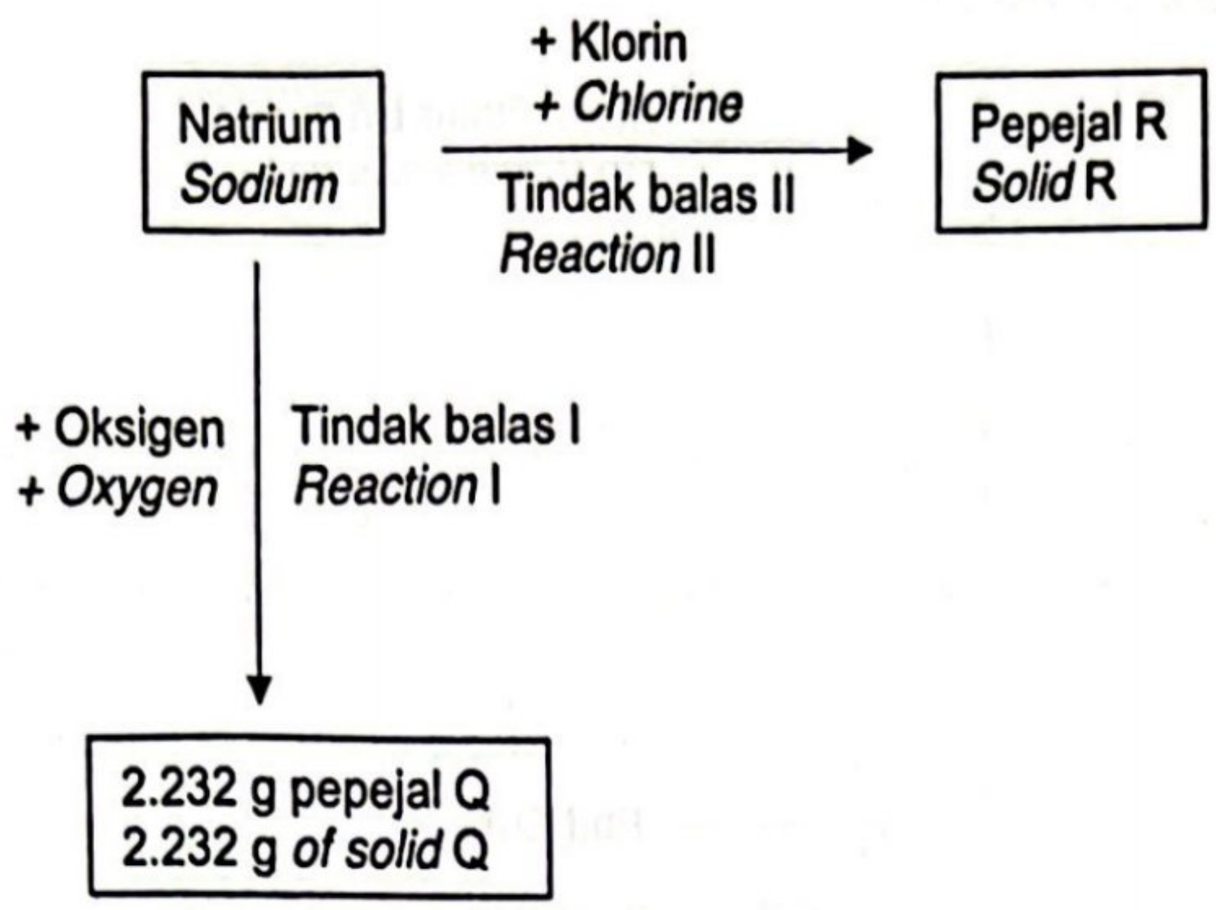
A Haba bagi tindak balas ialah 70 kJ.
The heat of reaction is 70 kJ

B R dan S adalah lebih stabil daripada P dan Q.
R *and* S *are more stabil than* P *and* Q.

C Tenaga pengaktifan bagi tindak balas adalah 200 kJ.
The activation energy is 200 kJ.

D Haba terbebas apabila P bertindak balas dengan Q untuk menghasilkan R dan S.
Heat is released when P *reacts with* Q *to produce* R *and* S.

36 Rajah 36 menunjukkan dua tindak balas berbeza suatu logam.
Diagram 36 *shows two different reactions of a metal.*



Rajah/ *Diagram* 36

Berapakah jisim pepejal R yang terbentuk apabila jisim natrium yang sama digunakan dalam tindak balas I dan tindak balas II?
What is the mass of solid R *formed when the same mass of sodium is used in reaction* I *and reaction* II?

[Jisim atom relatif: Na = 23, O = 16, Cl = 35.5]
[*Relative atomic mass*: Na = 23, O = 16, Cl = 35.5]

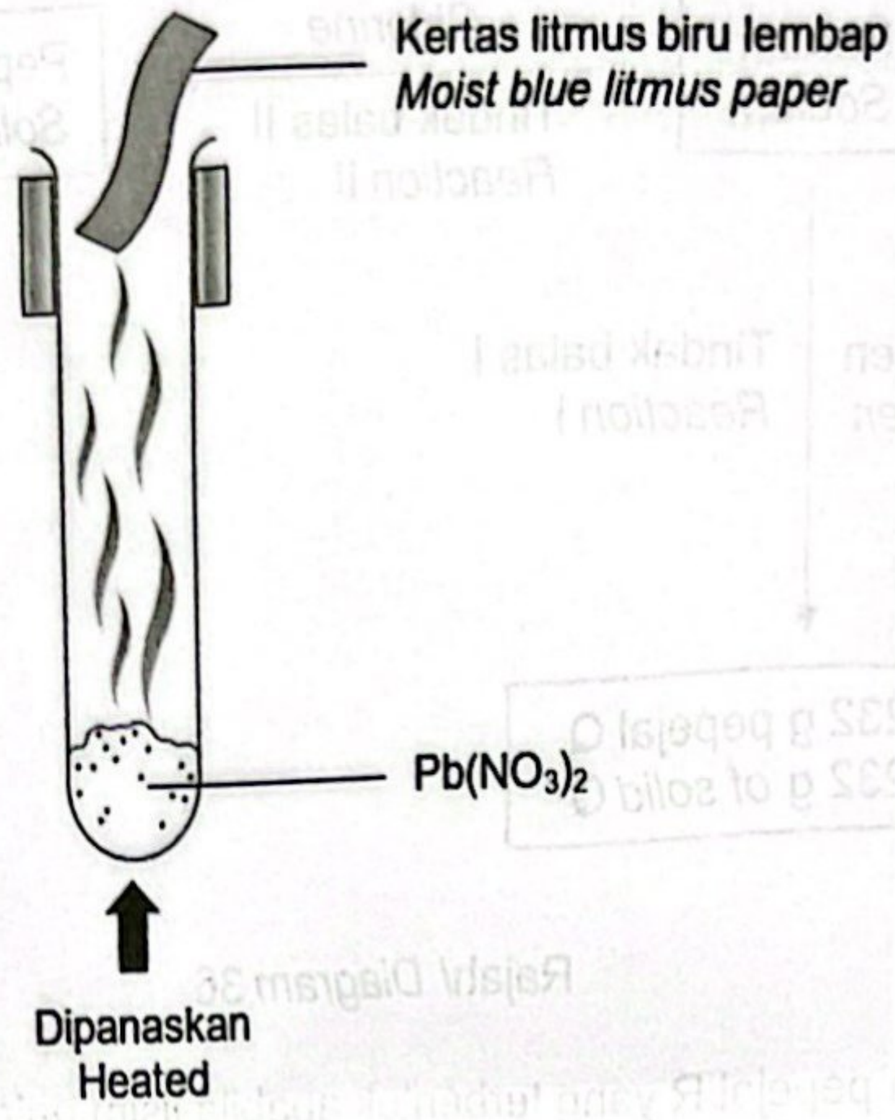
A 0.828 g

B 1.656 g

C 4.212 g

D 8.424 g

37 Rajah 37 menunjukkan tindak balas penguraian plumbum(II) nitrat, $Pb(NO_3)_2$ apabila dipanaskan pada suhu dan tekanan bilik.
Diagram 37 show the decomposition reaction of lead(II) *nitrate,* $Pb(NO_3)_2$ *when heated at room temperature and pressure.*



Rajah/ *Diagram* 37

Antara berikut, yang manakah benar apabila 0.1 mol plumbum(II) nitrate, $Pb(NO_3)_2$ terurai?
Which of the following is true when 0.1 *mol of lead*(II) *nitrate,* $Pb(NO_3)_2$ *is decomposed?*

[Jisim formula relatif: PbO = 223 dan 1 mol gas menempati isipadu sebanyak 24 dm^3 pada suhu dan tekanan bilik]
[*Relative formula mass*: PbO = 223 *and* 1 *mol gas occupies the volume* 24 dm^3 *at room temperature and pressure*]

A 2.23 g plumbum(II) oksida terbentuk
2.23 g *lead*(II) *oxide is formed*

B 2.4 dm^3 gas oksigen terbebas
2.4 dm^3 *oxygen gas released*

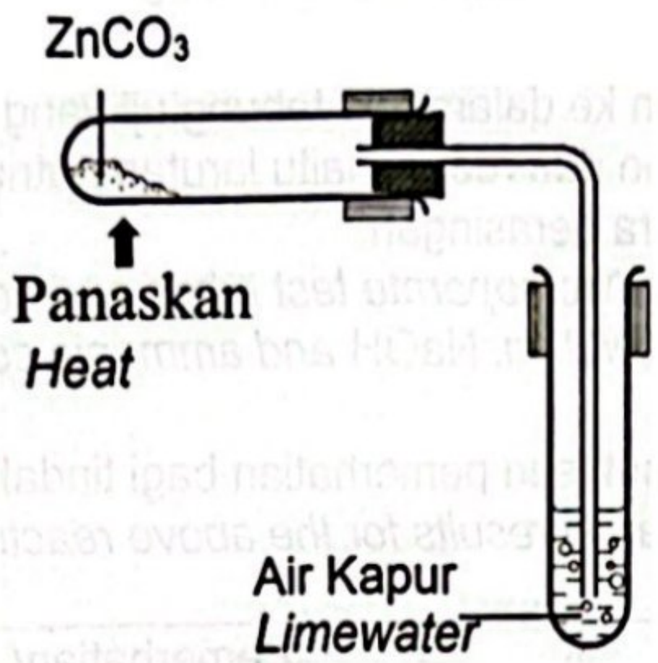
C 4.46 g plumbum(II) oksida terbentuk
4.46 g *lead*(II) *oxide is formed*

D 4800 cm^3 gas nitrogen dioksida terbebas
4800 cm^3 *nitrogen oxide gas released*

38 Rajah 38 menunjukkan satu ujikaji untuk mengesan kehadiran gas karbon dioksida di dalam makmal.
Diagram 38 *shows an experiment to detect the presence of carbon dioxide in a laboratory.*

Berapakan jisim bahan yang diperlukan sekiranya isipadu gas karbon dioksida yang terhasil adalah 350 cm^3?
What is the mass of reactant required if the volume of carbon dioxide gas produced is 350 cm^3?

[Jisim atom relatif: Zn = 65 ; C = 12 ; O = 16 ; Isipadu molar = 24 dm^3mol^{-1} pada keadaan bilik]
[*Relative atomic mass*: Zn = 65 ; C = 12 ; O = 16 ; Molar volume = 24 dm^3mol^{-1} at room condition]



Rajah / *Diagram* 38

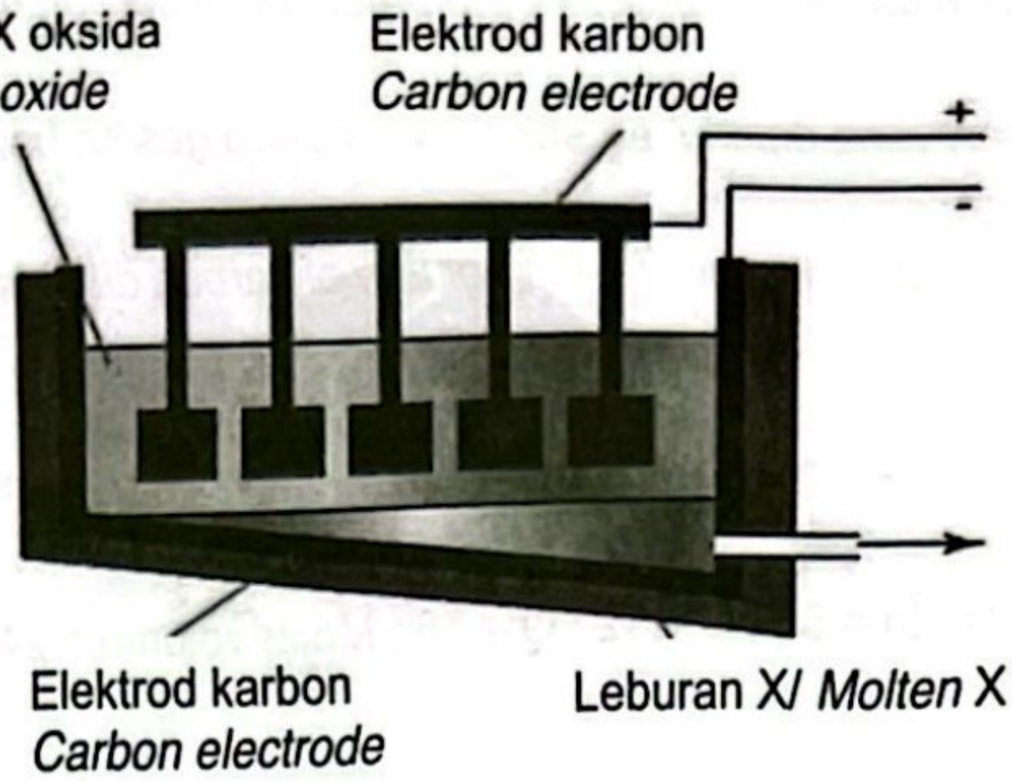
A 2.055 g

B 1.825 g

C 0.125 g

D 0.0146 g

39 Rajah 39 menunjukkan susunan radas bagi mengekstrak logam daripada bijihnya.
Diagram 39 shows the apparatus set-up for extracting metal from the ore.



Rajah/ *Diagram* 39

2 cm^3 leburan X dimasukkan ke dalam dua tabung uji yang berasingan dan ditambahkan dengan dengan dua reagen iaitu larutan natrium hidroksida, NaOH dan larutan ammonia, NH_3 secara berasingan.
2 cm^3 *of molten* X *is put into two separate test tubes and added with two reagents which is sodium hydroxide solution,* NaOH *and ammonia solution,* NH_3 *separately.*

Jadual 39 menunjukkan keputusan pemerhatian bagi tindak balas di atas.
Table 39 *shows the observation results for the above reaction.*

Reagen/ *Reagent*	Pemerhatian/ *Observation*
Larutan Natrium hidroksida,NaOH *Sodium hydroxide solution,* NaOH	Mendakan putih yang tidak larut di dalam larutan natrium hidroksida, NaOH berlebihan. *A white precipitate insoluble in sodium hydroxide solution, excess* NaOH
Larutan Ammonia, NH_3 *Ammonia solution,* NH_3	Tiada perubahan *No change*

Jadual/ *Table* 39

Leburan X bertindak balas dengan asid hidroklorik menghasilkan garam terlarutkan.
Apakah perubahan nombor pengoksidaan X.
Molten X *reacts with hydrochloric acid to form a soluble salt.*
What is the change in oxidation number of X.

A +3 kepada 0
+3 *to* 0

B +2 kepada 0
+2 *to* 0

C 0 kepada +2
0 *to* +2

D 0 kepada +3
0 *to* +3

40 Persamaan termokimia bagi pembakaran lengkap etanol, C_2H_5OH ditunjukkan di bawah.
The thermochemical equation for the complete combustion of ethanol, C_2H_5OH *is shown below.*

$$C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O \quad \Delta H = -1376 \text{ kJmol}^{-1}$$

Jika 6.9 g etanol terbakar dalam oksigen berlebihan, berapakah haba yang dibebaskan?
If 6.9 g *of ethanol is burnt in excess oxygen, how much is the heat released?*

[Jisim atom relatif: C = 12; H = 1, O = 16]
[*Relative atomic mass*: C = 12; H = 1, O = 16]

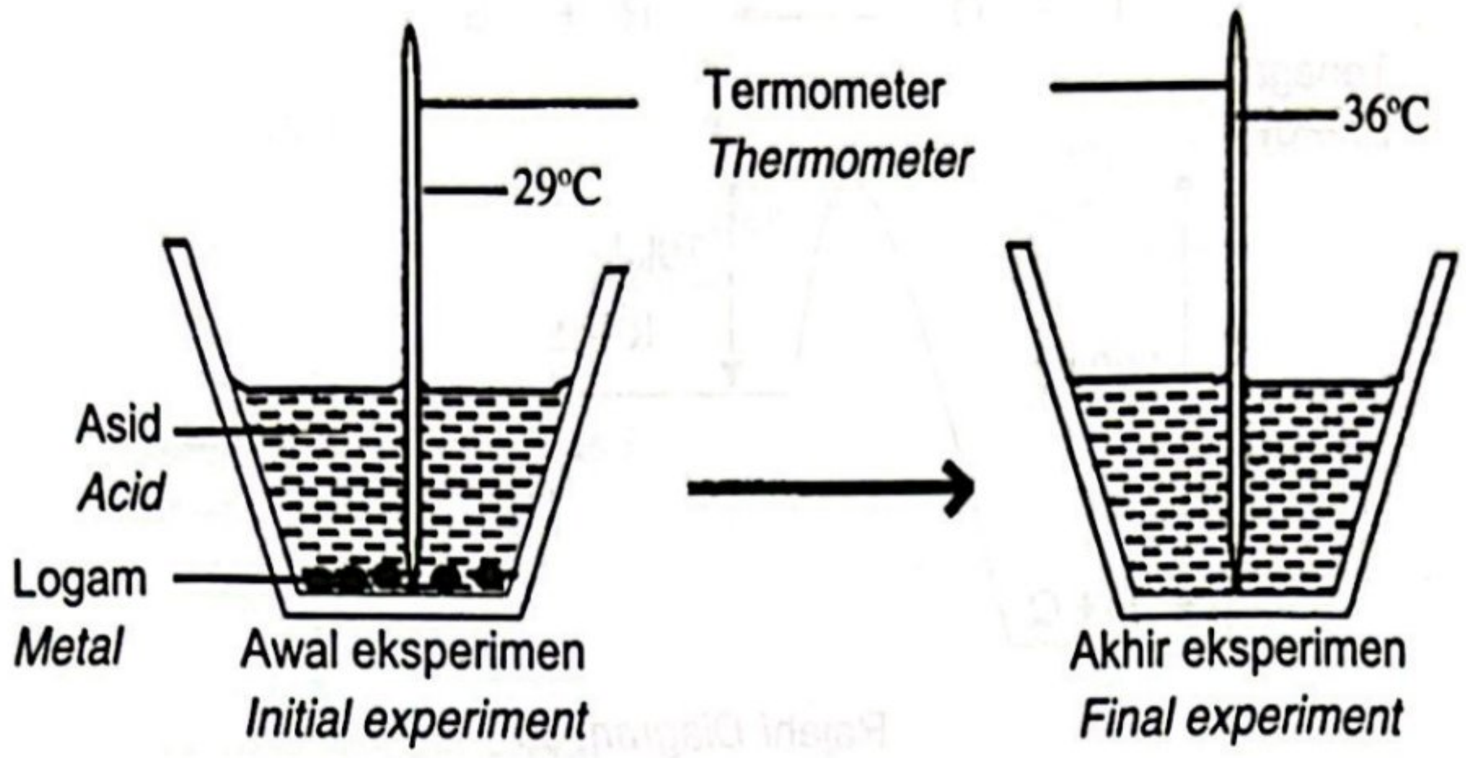
A 9173.3 kJ

B 206.4 kJ

C 198.69 kJ

D 0.15 kJ

34 Rajah 34 menunjukkan susunan radas untuk menentukan haba tindak balas.
Diagram 34 shows the setup of apparatus for the determination of heat of reaction.



Rajah/ *Diagram* 34

Antara pernyataan berikut manakah benar?
Which of the following statements is true?

A Proses pemecahan ikatan berlaku.
The process of bond breaking occurs.

B Suhu meningkat semasa tindak balas berlaku.
The temperature increases during the reaction.

C Nilai ΔH dalam tindak balas ini adalah positif
The value of ΔH for the reaction is positive.

D Kandungan tenaga hasil tindak balas lebih tinggi daripada kandungan tenaga bahan tindak balas.
The energy content of the products is higher than the energy content of the reactants.