

Nama : Kelas :



فَرَسِيدُكَ عَنْ فَعْنُوَادِ اَزْجَلِيْسِرْ فَعْنُوَادِ
مَعْمَدُكَ اَزْجَلِيْسِرْ سَكُوْلَةُ مَعْمَدُكَ اَزْجَلِيْسِرْ
يَا اَسْنِ اِسْلَامْ كَلْتَن



Kimia
Kertas 1 (4541/1)
Ogos 2025
1 jam 15 min

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
TAHUN 2025 M / 1447 H**

**KIMIA
KERTAS 1**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Tulis nama dan tingkatan anda pada ruang yang disediakan.
2. Kertas soalan ini mengandungi 40 soalan.
3. Jawab semua soalan.
4. Bagi setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.
5. Kertas peperiksaan ini adalah dalam dwibahasa.
6. Kertas jawapan objektif hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

Kertas soalan ini mengandungi 18 halaman bercetak dan 2 halaman tidak bercetak

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[LIHAT HALAMAN SEBELAH

1. Jadual 1 menunjukkan nombor proton bagi unsur P, Q, R dan S.
Table 1 shows the proton number of elements P, Q, R and S.

Unsur / Element	P	Q	R	S
Nombor proton / Proton number	7	8	17	15

Jadual 1 / Table 1

Pasangan unsur yang manakah mempunyai bilangan elektron valens yang sama?

Which pair of elements has the same number of valence electrons?

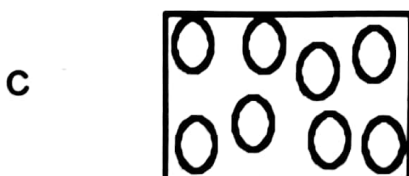
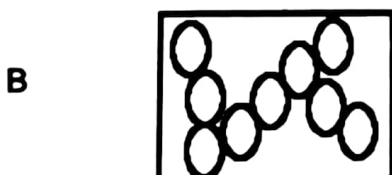
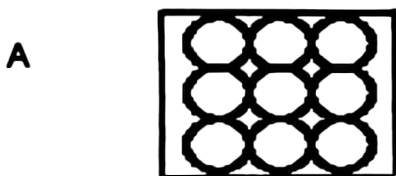
- | | | | |
|---|---------------------------|---|---------------------------|
| A | P dan Q
<i>P and Q</i> | C | Q dan R
<i>Q and R</i> |
| B | P dan S
<i>P and S</i> | D | Q dan S
<i>Q and S</i> |

2. Seorang pesakit telah disahkan menghidap kanser. Isotop manakah digunakan untuk merawat kanser?
A patient has been diagnosed with cancer. Which isotope is used to treat cancer?

- | | | | |
|---|--------------------------------|---|--------------------------------------|
| A | Karbon-14
<i>Carbon-14</i> | C | Fosforus-32
<i>Phosphorous-32</i> |
| B | Natrium-24
<i>Sodium-24</i> | D | Kobalt-60
<i>Cobalt-60</i> |

3. Rajah yang manakah menunjukkan daya tarikan antara zarah yang paling lemah?

Which diagram shows the weakest attraction between particles?



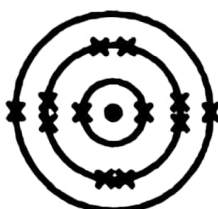
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4. Antara bahan berikut, yang manakah mengandungi ion?
Which of the following substance consists of ions?

- | | | | |
|---|------------------------------------|---|------------------|
| A | Natrium klorida
Sodium chloride | C | Argon
Argon |
| B | Karbon dioksida
Carbon dioxide | D | Kuprum
Copper |

5. Rajah 1 menunjukkan susunan elektron bagi atom M.
Diagram 1 shows the electron arrangement of an atom M.



Rajah 1 / Diagram 1

Antara berikut yang manakah kedudukan unsur M dalam Jadual Berkala Unsur?

Which of the following is the position of element M in the Periodic Table of Elements?

	Kumpulan / Group	Kala / Period
A	2	2
B	2	3
C	12	2
D	12	3

6. Pernyataan manakah yang paling baik menerangkan pembentukan ikatan kovalen?

Which statement best explains the formation of covalent bond?

- | | |
|---|--|
| A | Atom logam berkongsi elektron dengan atom bukan logam
Metal atoms share electrons with non-metal atoms |
| B | Atom bukan logam berkongsi elektron dengan atom bukan logam
Non-Metal atoms share electrons with non-metal atoms |
| C | Atom logam menderma elektron manakala atom bukan logam menerima elektron
Metal atoms donate electrons while non-metal atom accept electron |
| D | Atom bukan logam menderma elektron manakala atom logam menerima elektron
Non-Metal atoms donate electrons while metal atom accepts electron |

7. Antara berikut bahan manakah bersifat asid?
Which of the following substances is acidic?

- | | | | |
|---|--|---|--|
| A | Natrium hidroksida
Sodium hydroxide | C | Sulfur dioksida
Sulphur dioxide |
| B | Ammonia
Ammonia | D | Kalium hidroksida
Potassium hydroxide |

8. Maklumat berikut mengenai model struktur atom yang dikemukakan oleh ahli sains.

The following information about the atomic structure model explained by one of the scientists.

- Menjumpai zarah neutral, iaitu neutron wujud di dalam nukleus.
Discovered neutral particles, that are neutrons in the nucleus.
- Neutron menyumbang hampir separuh daripada jisim sesuatu atom.
Neutrons contribute almost half of the mass of an atom

- | | | | |
|---|----------------|---|-------------------|
| A | James Chadwick | C | JJ Thomson |
| B | Neils Bohr | D | Ernest Rutherford |

9. Formula kimia manakah yang dinamakan dengan betul berdasarkan sistem penamaan IUPAC?

Which chemical formula is correctly named according to the IUPAC nomenclature system?

	Formula kimia <i>Chemical formula</i>	Nama IUPAC <i>IUPAC name</i>
A	SO ₃	Sulfur oksida / <i>Sulphur oxide</i>
B	CuO	Kuprum oksida / <i>Copper oxide</i>
C	CO	Karbon dioksida / <i>Carbon dioxide</i>
D	CCl ₄	Tetraklorometana / <i>Tetrachloromethane</i>

10. Antara unsur Kumpulan 1 berikut, yang manakah mempunyai saiz atom paling kecil?

Which of the following Group 1 elements has the smallest atomic size?

- | | | | |
|---|--------------------------|---|-------------------------------|
| A | Litium
<i>Lithium</i> | C | Kalium
<i>Potassium</i> |
| B | Natrium
<i>Sodium</i> | D | Magnesium
<i>Magnesium</i> |

11. Antara yang berikut, apakah proses yang berlaku semasa memberus gigi?

Which of the following is a process which occur during tooth brushing?

- | | | | |
|---|--|---|--------------------------------------|
| A | Pengoksidaan
<i>Oxidation</i> | C | Peneutralan
<i>Neutralisation</i> |
| B | Penghidrogenan
<i>Hydrogenation</i> | D | Penurunan
<i>Reduction</i> |

12. Bahan kimia yang mempunyai kepekatan ion hidroksida yang tinggi ialah

The chemical substance with low concentration of hydroxide ion is

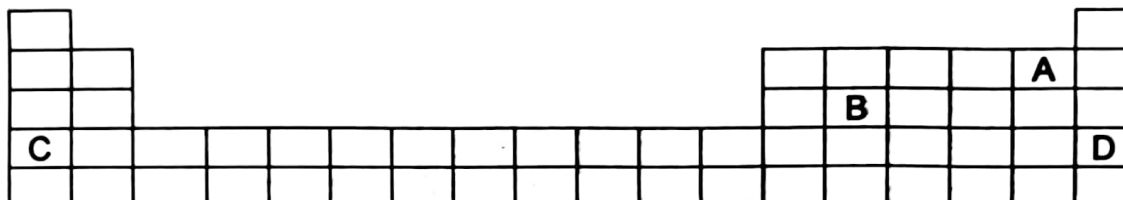
- | | | | |
|---|------------------------------------|---|-------------------------------------|
| A | Asid lemah
<i>Weak acid</i> | C | Asid kuat
<i>Strong acid</i> |
| B | Alkali lemah
<i>Weak alkali</i> | D | Alkali kuat
<i>Strong alkali</i> |

13. Bagaimanakah mangkin dapat meningkatkan kadar tindak balas?

How does the catalyst can increase the rate of reaction?

- A Meningkatkan jumlah bilangan zarah-zarah bahan tindak balas
Increase the total number of reactant particles
- B Meningkatkan tenaga kinetik zarah-zarah bahan tindak balas
Increase the kinetic energy of reactant particles
- C Merendahkan tenaga pengaktifan tindak balas
Decrease the activation energy of the reaction
- D Meningkatkan bilangan pelanggaran berkesan
Increase the number of effective collision

- Which of the following should be kept in paraffin oil?**



Which compound is correctly matched with its type of bond?

	Bahan / Substance	Jenis ikatan / Types of bonds
A	Klorin / Chlorine	Ion / Ionic
B	Karbon dioksida / Carbon dioxide	Ion / Ionic
C	Natrium oksida / Sodium oxide	Kovalen / Covalent
D	Ammonia / Ammonia	Kovalen / Covalent

- Diagram 3 shows a fruit that contains compound R which has fruity smell.**

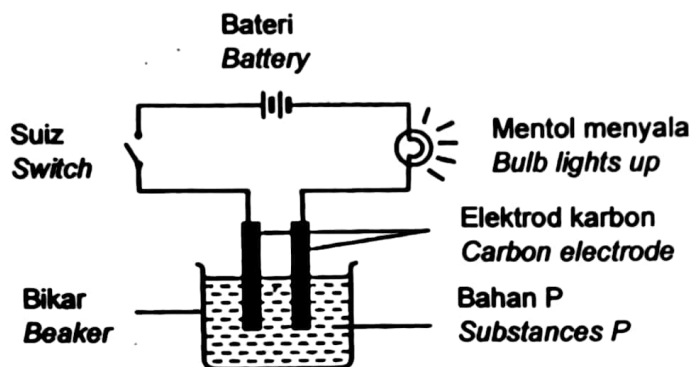


Rajah 3 / Diagram 3

What is the homologous series of compound R?

- | | | | |
|----------|---|----------|--------------------------------|
| A | Asid karboksilik
<i>Carboxylic acid</i> | C | Alkana
<i>Alkane</i> |
| B | Alkohol
<i>Alcohol</i> | D | Ester
<i>Ester</i> |

17. Rajah 4 menunjukkan suatu sel elektrolisis.
Diagram 4 shows an electrolytic cell.

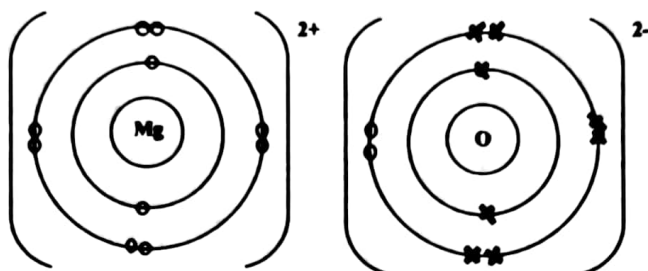


Rajah 4 / Diagram 4

Antara berikut, yang manakah bahan P?
Which of the following is substance P?

- A Larutan natrium klorida
Sodium chloride solution
 - B Etil etanoat
Ethyl ethanoate
 - C Larutan glukosa
Glucose solution
 - D Klorometana
Chloromethane
18. Antara yang berikut, yang manakah adalah bahan asas kosmetik?
Which of the following is the basic cosmetics ingredients?
- A Air dan antioksida
Water and antioxidant
 - B Air dan pengemulsi
Water and emulsifier
 - C Air dan losyen
Water and lotion
 - D Antioksida dan losyen
Antioxidant and lotion

19. Rajah 5 menunjukkan susunan elektron bagi sebatian magnesium oksida.
Diagram 5 shows the electron arrangement of magnesium oxide compound.



Rajah 5 / Diagram 5

Yang manakah antara berikut merupakan sifat bagi sebatian tersebut?
Which of the following are the properties of the compound?

- | | |
|-----|---|
| I | Mengkonduksikan elektrik dalam keadaan lebur
<i>Conducts electricity in molten state</i> |
| II | Wujud sebagai cecair pada suhu bilik
<i>Exists as liquid at room temperature</i> |
| III | Mempunyai takat lebur yang tinggi
<i>Has high melting point</i> |
| IV | Larut dalam pelarut organik
<i>Dissolve in organic solvent</i> |
| A | I dan II
<i>I and II</i> |
| B | I dan III
<i>I and III</i> |
| C | II dan IV
<i>II and IV</i> |
| D | III dan IV
<i>III and IV</i> |

20. Apabila bahan R ditambahkan pada lateks, proses penggumpalan lateks berlaku.
 Apakah bahan R?

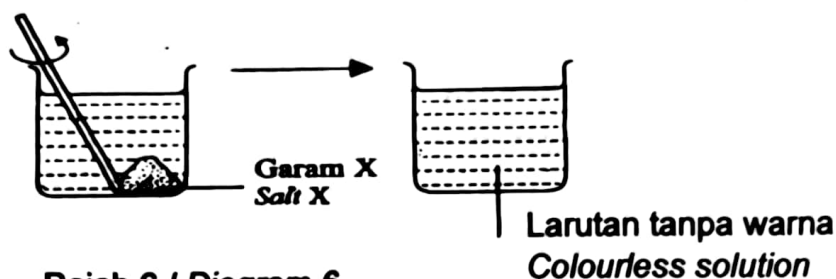
When substance R is added to latex, the latex coagulation process occurs.
What is substance R ?

- | | | | |
|---|--------------------------------------|---|---|
| A | Asid etanoik
<i>Ethanoic acid</i> | C | Ammonia
<i>Ammonia</i> |
| B | Air
<i>Water</i> | D | Natrium hidroksida
<i>Sodium hydroxide</i> |

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21. Rajah 6 menunjukkan garam X ditambahkan ke dalam air.
Diagram 6 shows salt X is added to water.



Rajah 6 / Diagram 6

Apakah garam X?
What is salt X?

- | | | | |
|---|---|---|--|
| A | Kalium klorida
<i>Potassium chloride</i> | C | Kuprum(II) sulfat
<i>Copper(II)sulphate</i> |
| B | Argentum klorida
<i>Silver chloride</i> | D | Zink karbonat
<i>Zinc carbonate</i> |
22. Antara berikut yang manakah polimer semulajadi?
Which of the following is natural polymer?
- | | | | |
|---|---|---|-----------------------------------|
| A | Polisoprena
<i>Polyisoprene</i> | C | Polipropena
<i>Polypropene</i> |
| B | Polikloroetena
<i>Polychloroethene</i> | D | Nilon
<i>Nylon</i> |
23. Sabun merupakan bahan pencuci yang digunakan dalam membasuh dan penjagaan kebersihan peribadi.
Soap is a cleaning agent that is used for washing and personal hygiene. Which of the following is true about soap?
- | | |
|---|--|
| A | Sabun adalah lemak.
<i>Soap is fat.</i> |
| B | Sabun dihasilkan daripada tindak balas pemendakan
<i>Soap is produced from precipitation reaction</i> |
| C | Sabun ialah garam natrium atau kalium bagi asid lemak
<i>Soap is sodium or potassium fatty acid salts</i> |
| D | Formula am bagi sabun ialah $\text{RCOO}\cdot\text{Ca}^{2+}$
<i>General formula for soap is $\text{RCOO}\cdot\text{Ca}^{2+}$</i> |

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24. Unsur X terletak dalam kumpulan yang sama dengan kuprum dalam Jadual Berkala Unsur. Antara yang berikut, yang manakah ciri-ciri bagi X?
Element X is located in the same group with copper in the Periodic Table of Elements. Which of the following are the characteristics of X?

- | | | | |
|-----|--|---|---------------------------------|
| I | Takat lebur rendah
<i>Low melting point</i> | | |
| II | Bertindak sebagai mangkin
<i>Act as catalyst</i> | | |
| III | Konduktor haba yang lemah
<i>Poor heat conductor</i> | | |
| IV | Mempunyai lebih daripada satu nombor pengoksidaan
<i>Has more than one oxidation number</i> | | |
| A | I dan II
<i>I and II</i> | C | II dan III
<i>II and III</i> |
| B | I dan III
<i>I and III</i> | D | II dan IV
<i>II and IV</i> |

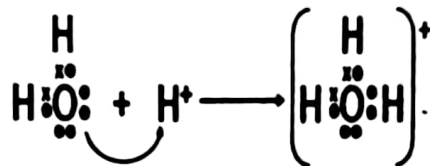
25. Antara berikut, yang manakah boleh digunakan untuk menghasilkan periuk kaca untuk memasak?
Which of the following can be used to make a glass pot for cooking?

- | | | | |
|---|---|---|---|
| A | Kaca soda kapur
<i>Soda-lime glass</i> | C | Kaca silika terlakur
<i>Fused silica glass</i> |
| B | Kaca borosilikat
<i>Borosilicate glass</i> | D | Kaca plumbum
<i>Lead crystal glass</i> |

26. Ozon, O_3 merupakan gas yang terdiri daripada tiga atom oksigen. Apakah nombor pengoksidaan bagi oksigen dalam molekul ozon?
Ozone, O_3 is a gas consists of three oxygen atoms. What is the oxidation number of oxygen in ozone molecule?

- | | | | |
|---|----|---|----|
| A | -6 | C | -1 |
| B | -2 | D | 0 |

27. Persamaan kimia manakah yang diseimbangkan dengan betul?
Which chemical equation is correctly balanced?
- A $\text{Ca}(\text{NO}_3)_2 \rightarrow \text{CaO} + 2\text{NO}_2 + \text{O}_2$
- B $\text{C}_3\text{H}_7\text{OH} + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- C $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$
- D $\text{Na}_2\text{S}_2\text{O}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + 2\text{S} + \text{SO}$
28. Rajah 7 menunjukkan bagaimana suatu ikatan kimia terbentuk.
Diagram 7 shows how a chemical bond is formed.



Rajah 7 / Diagram 7

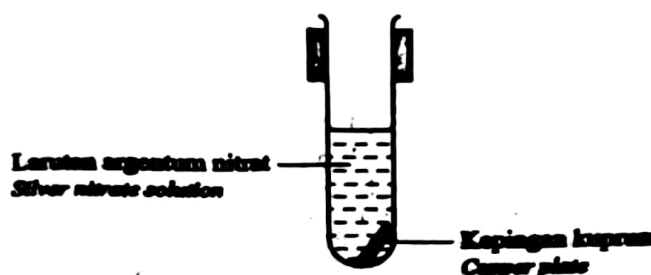
Antara pernyataan berikut, yang manakah paling tepat mendefinisikan ikatan kimia yang ditunjukkan dalam Rajah 7.

Which of the following statements most accurately defines the chemical bond shown in Diagram 7.

- A Ikatan terbentuk melalui pemindahan elektron valens antara molekul dan ion yang bercas positif.
Bonds are formed through the transfer of valence electrons between positively charged molecules and ions.
- B Ikatan yang terbentuk adalah ikatan kovalen yang mana pasangan elektron yang dikongsi berasal dari satu atom sahaja.
The bond formed is a covalent bond which the shared electron pair comes from only one atom.
- C Ikatan kimia yang terbentuk apabila ion hidrogen menderma elektron valens kepada satu molekul air.
The chemical bond formed when hydrogen ion donates valence electron to one molecule of water.
- D Ikatan kimia yang terbentuk apabila atom hidrogen tertarik kepada atom yang lebih elektronegatif.
The chemical bond formed hydrogen atom attract to more electronegative atom.

29. Rajah 8 menunjukkan susunan radas untuk mengkaji tindak balas penyesaran logam.

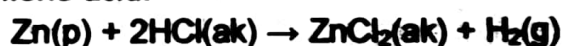
Diagram 8 shows the apparatus set up to study the displacement reaction of metal.



Rajah 8 / Diagram 8

Apakah pemerhatian bagi tindak balas dalam Rajah 8?
What is the observation for the reaction in Diagram 8?

- A Kuprum semakin menipis
Copper become thinner
 - B Pepejal perang terbentuk
Brown solid is formed
 - C Keamatan warna biru larutan berkurang
Intensity of blue colour solution decreases
 - D Gas tidak berwarna terbebas
Colourless gas is released
30. Berikut adalah persamaan kimia bagi tindak balas antara zink dan asid hidroklorik. *The following is the chemical equation for the reaction between zinc and hydrochloric acid.*



Masa yang diambil untuk tindak balas lengkap antara 500 cm³ asid hidroklorik 0.5 mol dm⁻³ dengan serbuk zink berlebihan adalah 4 minit 30 saat. Berapakah kadar tindak balas ini?

[Jisim atom relatif: Zn = 65, 1 mol gas menempati 24 dm³ pada keadaan bilik]
The time taken for the complete reaction between 500 cm³ of 0.5 mol dm⁻³ hydrochloric acid reacted with excess zinc powder is 4 minutes 30 seconds.

What is the rate of reaction?

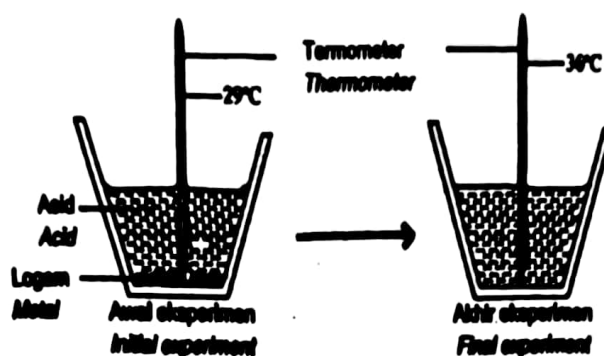
[Relative atomic mass: Zn = 65, 1 mol of gas occupies 24 dm³ at room conditions]

- A 0.011 cm³s⁻¹
- B 0.022 cm³s⁻¹
- C 11.11 cm³s⁻¹
- D 22.22 cm³s⁻¹

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31. Rajah 9 menunjukkan susunan radas untuk menentukan haba tindak balas. *Diagram 9 shows the setup of apparatus for the determination of heat of reaction*



Rajah 9 / Diagram 9

Antara pernyataan berikut manakah benar?

Which of the following statements is true?

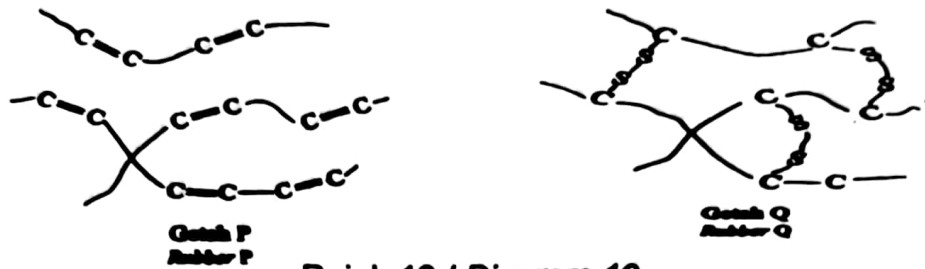
- A Proses pemecahan ikatan berlaku.
The process of bond breaking occurs.
- B Suhu meningkat semasa tindak balas berlaku
The temperature increases during the reaction
- C Jumlah kandungan tenaga hasil tindak balas lebih tinggi daripada jumlah kandungan tenaga bahan tindak balas.
Total the energy content of the product is higher than total the energy content of the reactants.
- D Nilai ΔH dalam tindak balas ini adalah positif
The value of ΔH for the reaction is positive.
32. Rani telah mencuci baju dengan menggunakan air telaga tetapi kesan kotoran masih ada. Antara yang berikut, pernyataan manakah yang paling tepat menerangkan situasi itu?
Rani has washed his clothes using water from the well but the dirt is still there. Which of the following statements is the most accurately describe the situation?
- A Terdapat ion Ca^{2+} dan ion Mg^{2+} dalam air telaga
There are Ca^{2+} ions and Mg^{2+} ions in the well water
- B Kewujudan garam tak terlarutkan
The presence of insoluble salts
- C Air telaga terlalu sejuk
The well water is too cold
- D Menggunakan kuantiti detergen yang sedikit
Use a small quantity of detergent

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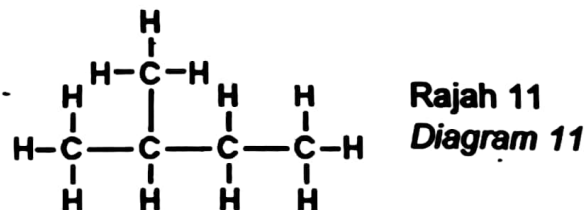
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33. Rajah 10 menunjukkan struktur bagi dua jenis getah.
Diagram 10 shows the structure of two types of rubbers.



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

- A Getah P lebih keras daripada getah Q
Rubber P is harder than rubber Q
- B Getah P lebih kenyal daripada getah Q
Rubber P is more elastic than rubber Q
- C Getah P tahan haba yang tinggi
Rubber P high heat resistance
- D Getah P lebih mudah teroksida daripada getah Q
Rubber P is oxidised more easily than rubber Q
34. Rajah 11 di bawah menunjukkan satu sebatian hidrokarbon tepu.
Diagram 11 below shows a saturated hydrocarbon.



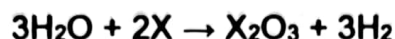
Antara berikut, yang manakah isomer bagi hidrokarbon tersebut?
Which of following are the isomers of the hydrocarbon?

- | | | | |
|----|------------------------|-----|---|
| I | Pentana
Pentane | III | 2,2-dimetilpropana
2,2-dimethylpropane |
| II | Butana
Butane | IV | 3-metilbutana
3-methylbutane |
| A | I dan II
I and II | C | II dan IV
II and IV |
| B | I dan III
I and III | D | III dan IV
III and IV |

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35. Persamaan berikut mewakili pengoksidaan logam X oleh stim.
The following equation represents the oxidation of metal X by steam.



Berapakah jisim maksimum X_2O_3 yang dihasilkan apabila 50 g stim bertindak balas dengan 100 g logam X?

What is the maximum mass of X_2O_3 produced when 50 g of steam reacts with 100 g of metal X ?

[Jisim atom relatif/ *Relative atomic mass*: H = 1; O = 16; X = 56]

- | | | | |
|---|--------|---|---------|
| A | 20.7 g | C | 142.9 g |
| B | 21.4 g | D | 148.8 g |

36. Jadual 2 menunjukkan takat lebur dan takat didih bagi empat bahan W, X, Y dan Z.

Table 2 shows the melting points and boiling points of four substance W, X, Y and Z.

Bahan Substance	Takat lebur (°C) Melting point (°C)	Takat didih (°C) Boiling point (°C)
W	-187	-126
X	-67	70
Y	78	125
Z	160	2400

Jadual 2 / Table 2

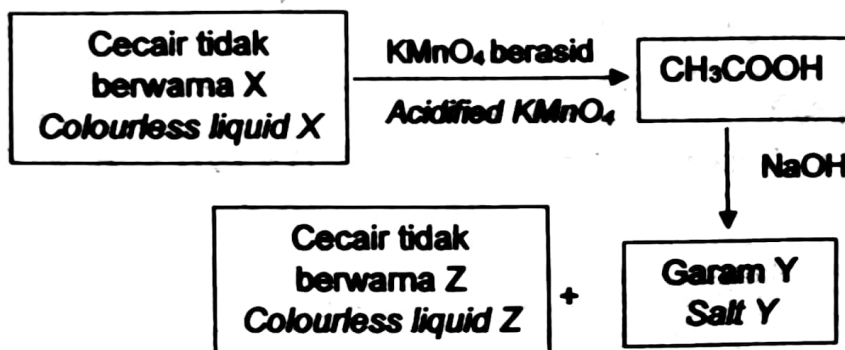
Bahan yang manakah mempunyai susunan zarah yang sangat jauh antara satu sama lain pada suhu bilik?

Which substance has an arrangement of particles which are very far apart from each another at room temperature?

- | | | | |
|---|---|---|---|
| A | W | C | Y |
| B | X | D | Z |

37. Rajah 12 menunjukkan carta alir bagi penukaran cecair X kepada asid etanoik dan tindak balas asid etanoik.

Diagram 12 below shows the conversion of liquid X to ethanoic acid and reaction of ethanoic acid.



Rajah 12 / Diagram 12

Berdasarkan rajah, kenal pasti X, Y dan Z.

Based on diagram, identify X, Y and Z.

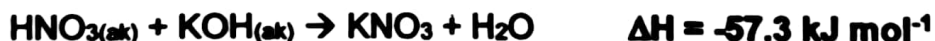
	X	Y	Z
A	CH ₃ OH	CH ₃ COONa	CH ₃ COOCH ₂
B	C ₂ H ₅ OH	CH ₃ COOCH ₂	CH ₃ COONa
C	CH ₃ OH	CH ₃ COONa	H ₂ O
D	C ₂ H ₅ OH	CH ₃ COONa	H ₂ O

38. Persamaan termokimia berikut mewakili tindak balas peneutralan di antara 25 cm³ asid nitrik dan 25 cm³ larutan kalium hidroksida yang sama kemolaran. Suhu campuran meningkat sebanyak 7 °C.

[Muatan haba tentu larutan = 4.2 J g⁻¹ °C⁻¹, Ketumpatan larutan = 1 g cm⁻³]

The following thermochemical equation represents the neutralization reaction between 25 cm³ acid nitric and 25 cm³ potassium hydroxide solution of the same molarity. The temperature of the mixture increase by 7 °C.

[Specific heat capacity of solution = 4.2 J g⁻¹ °C⁻¹, Density of solution = 1 g cm⁻³]

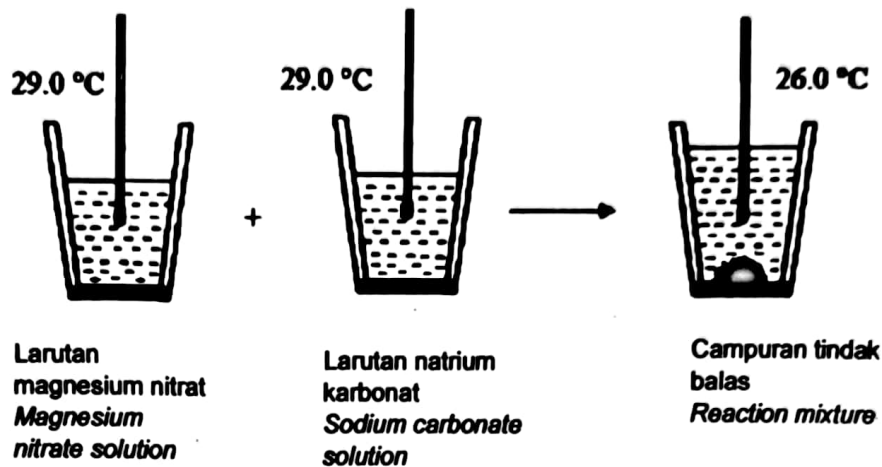


Apakah kemolaran bagi kedua-dua larutan?

What is the molarity of both solution?

- | | | | |
|---|---------------------------|---|---------------------------|
| A | 0.52 mol dm ⁻³ | C | 2.10 mol dm ⁻³ |
| B | 1.03 mol dm ⁻³ | D | 2.24 mol dm ⁻³ |

39. Rajah 13 menunjukkan susunan radas untuk menentukan haba tindak balas.
 Diagram 13 shows the apparatus set-up to determine the heat of reaction.



Rajah 13 / Diagram 13

Manakah antara pernyataan berikut adalah benar?
 Which of the following statement is true?

- | | |
|-----|--|
| I | Pembentukan ikatan berlaku.
Bond formation occurs. |
| II | Suhu menurun semasa tindak balas berlaku.
The temperature decreases during the reaction. |
| III | Nilai ΔH dalam tindak balas ini adalah negatif.
The value of ΔH for the reaction is negative. |
| IV | Jumlah kandungan tenaga hasil tindak balas lebih tinggi daripada jumlah kandungan tenaga bahan tindak balas.
The total energy content of the products is higher than the total energy content of the reactants. |
| 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 |

40. Seorang jurutera ingin mereka satu bahagian mesin yang memerlukan logam tahan lasak, tidak berkarat dan tahan haba.
Antara pilihan berikut, yang manakah paling sesuai digunakan?

An engineer wants to design a machine part that requires a durable, rust-free, and heat-resistant metal.

Which of the following options is most appropriate to use?

- A Aluminium tulen
 Pure aluminum
- B Besi tulen
 Pure iron
- C Kuprum tulen
 Pure copper
- D Keluli nirkarat
 Stainless steel

- KERTAS PEPERIKSAAN TAMAT –