CHAPTER 8: SALT
BAB 8: GARAM

OBJECTIVES QUESTIONS
SOALAN OBJEKTIF

1 Diagram 1 below shows a series of reaction that involves compound G.
Rajah 1 di bawah menunjukkan satu siri tindak balas yang melibatkan sebatian G.

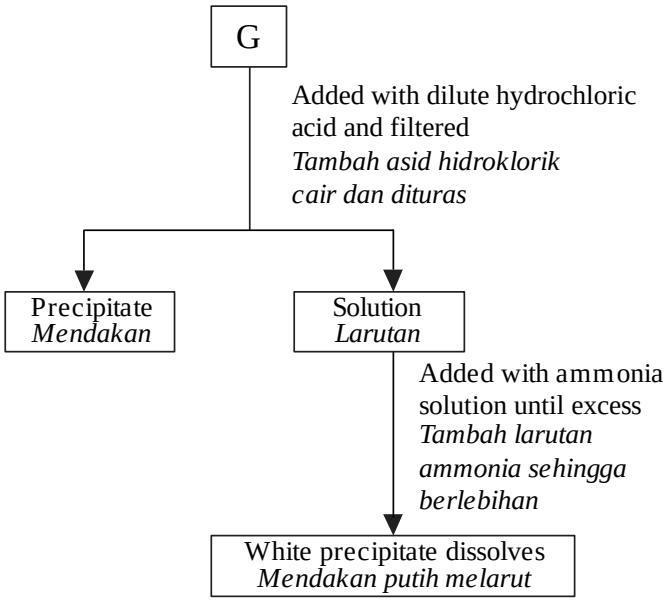

Diagram 1
Rajah 1

G is a mixture of two salts. Among the following, what is G?
G adalah campuran dua garam. Di antara berikut, apakah G?

A Lead (II) nitrate and zinc carbonate
Plumbum (II) nitrat dan zink karbonat
B Lead (II) nitrate and aluminium nitrate
Plumbum (II)nitrat dan aluminium nitrat
C Silver sulphate and copper (II) carbonate
Argentum sulfat dan kuprum (II) karbonat
D Magnesium sulphate and lead (II) carbonate
Magnesium sulfat dan plumbum (II) karbonat

2 Diagram 2 below shows the formula of a nitrate salt.

Rajah 2 menunjukkan formula bagi suatu garam nitrat.

XNO_3

Diagram 2
Rajah 2

Which of the following are the possible ions of X?
Antara berikut yang manakah mungkin ion bagi X?

I Silver ion, Ag^+
Ion argentum
II Hydroxide ion, OH^-
Ion hidroksida
III Carbonate ion, CO_3^{2-}
Ion karbonat

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

3 Diagram 3 below shows a chemical equation to prepare an insoluble salt.
Rajah 3 di bawah menunjukkan persamaan kimia bagi penyediaan garam tak terlarutkan

Na_2SO_4 *(aq)* $+Pb(NO_3)_2$ *(aq)* $\rightarrow 2NaNO_3$ *(aq)* $+ PbSO_4$ *(s)*

Diagram 3
Rajah 3

Which of the following is the **correct** ionic equation for the chemical equation?
*Antara berikut, yang manakah persamaan ion yang **betul** bagi persamaan kimia tersebut?*

A $Na^+ + NO_3^- \rightarrow NaNO_3$
B $Na^+ + SO_4^{2-} \rightarrow Na_2SO_4$
C $Pb^{2+} + 2NO_3^- \rightarrow Pb(NO_3)_2$
D $Pb^{2+} + SO_4^{2-} \rightarrow PbSO_4$

4 The following statements show the steps taken in an experiment.

Pernyataan berikut menunjukkan langkah-langkah yang diambil dalam satu eksperimen.

- Lead(II) nitrate solution is mixed with potassium iodide solution
  Larutan plumbum(II) nitrat dicampurkan dengan larutan kalium iodida
- The mixture is filtered
  Campuran dituraskan
- The residue is the filter paper is lead(II) iodide
  Baki turasan pada kertas turas ialah plumbum(II) iodida

Diagram 4
Rajah 4

The steps are related to
Langkah-langkah tersebut adalah berkaitan dengan

A Preparation of soluble salt
Penyediaan garam terlarut
B Preparation of insoluble salt
Penyediaan garam tak terlarut
C Purification of soluble salt
Penulenan garam terlarut
D Purification of insoluble salt
Penulenan garam tak terlarut

5 Diagram below shows the substance X and products formed.
Rajah di bawah menunjukkan pemanasan logam X dan hasil yang diperolehi.

$$\text{Substance X} \xrightarrow[\Delta]{} \text{Salt Y} + \text{Oxygen gas} + \text{Nitrogen dioxide gas}$$

$$\textit{Bahan X} \xrightarrow[\Delta]{} \textit{Garam Y} + \textit{Gas oksigen} + \textit{Gas nitrogen dioksida}$$

Diagram 5
Rajah 5

What is could substance X be?
Apakah kemungkinan bahan X?

A Magnesium oxide
Magnesium oksida
B Magnesium nitrate
Magnesium nitrat
C Zinc carbonate
Zink karbonat
D Zinc oxide
Zonk oksida

6 When powder of metal P is heated with black metal Q oxide, the following observations are made :
Apabila serbuk logam P dipanaskan dengan oksida logam Q yang berwarna hitam, pemerhatian berikut diperolehi.

- A glow is seen
  Baraan terbentuk
- The residue produced is yellow when it is hot and turns white when cold
  Baki yang terbentuk berwarna kuning bila panas, dan putih bila sejuk

Diagram 6
Rajah 6

Based on the information above, which statement is true?
Berdasarkan maklumat yang diberi, pernyataan yang mana adalah benar?

A The powder of metal Q can displace P from its salt solution
Serbuk logam Q boleh menyesarkan P daripada larutan garamnya
B Metal Q oxide can react with a heated carbon powder
Oksida logam Q boleh bertindakbalas dengan serbuk karbon yang dipanaskan
C Metal P oxide can react with a heated iron powder
Oksida logam P boleh bertindakbalas dengan serbuk besi yang panas
D The powder of metal P react with a heated magnesium oxide powder
Serbuk logam P boleh bertindakbalas dengan serbuk magnesium oksida yang panas

7 Which of the following are the physical characteristics of crystals?
Antara berikut, yang manakah merupakan sifat fizikal hablur?

I Have falt surfaces, straight edges and sharp angles
Mempunyai permukaan yang rata, sisi lurus dan sudut yang tajam
II Contain impurities
Mengandungi bendasing
III Insoluble in water
Tidak larut dalam air
IV Have fixed geometrical shapes such as a cuboid, rhombic or prism
Mempunyai bentuk geometri tertentu seperti kuboid, rombus atau prisma

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

8 The table 1 shows the cation test for solution X.
Jadual 1 menunjukkan ujian kation bagi larutan X.

Test ***Ujian***	**Observation** ***Pemerhatian***
Sodium hydroxide solution is added into aqueous solution X until in excess. *Larutan natrium hidroksida ditambahkan ke dalam larutan akueus X sehingga berlebihan.*	• White precipitate is formed • White precipitate does not dissolve in excess of sodium hydroxide solution. • *Mendakan putih terbentuk.* • *Mendakan putih tidak larut dalam larutan natrium hidroksida berlebihan.*
Ammonia aqueous is added into solution X. *Akueus ammonia ditambah ke dalam larutan X.*	No precipitate. *Tiada mendakan.*

Table 1
Jadual 1

What cation present in solution X?
Apakah kation yang hadir dalam larutan X?

A NH_4^+
B Zn^{2+}
C Mg^{2+}
D Ca^{2+}

9 Reaction between a soluble salt A and sodium iodide solution will produce an insoluble salt, lead (II) iodide.
Tindak balas antara garam terlarutkan A dan larutan natrium iodida akan menghasilkan garam tak terlarutkan, plumbum (II) iodida.

A + **Sodium iodide solution** ***Larutan natrium iodida*** → **Lead (II) iodide** ***Plmbum (II) iodida***

Diagram 7
Rajah 7

Which of the following substance is A?
Yang manakah antara berikut adalah A?

A Lead (II) nitrate
Plumbum (II) nitrat
B Lead (II) chloride
Plumbum (II) klorida
C Lead (II) carbonate
Plumbum (II) karbonat
D Lead (II) sulphate
Plumbum (II) sulfat

10 A series of test were carried out on a salt X solution. Table shows the results of the tests.
Satu siri ujian telah dijalankan ke atas larutan garam X. Jadual menunjukkan keputusan ujian tersebut.

Test ***Ujian***	**Observation** ***Pemerhatian***
Add lead(II) nitrate solution. *Tambahkan larutan plumbum(II) nitrat*	White precipitate dissolves in water when heated. *Mendakan putih,larut dalam air apabila dipanaskan.*
Add dilute sulphuric acid. *Tambahkan asid sulfurik cair.*	No change. *Tiada perubahan.*
Add sodium hydroxide solution until in excess. *Tambahkan larutan natrium hidroksida sehingga berlebihan.*	White precipitate is formed. It is insoluble in excess sodium hydroxide solution. *Mendakan putih terbentuk.* *Ia tidak larut dalam larutan natrium hidroksida berlebihan.*
Add ammonia solution until in excess. *Tambahkan larutan akueus ammonia sehingga berlebihan.*	White precipitate is formed. It is insoluble in excess ammonia solution. *Mendakan putih terbentuk.* *Ia tidak larut dalam larutan akueus ammonia berlebihan.*

Table 2
Jadual 2

Based on the results of the experiment, X salt is
Berdasarkan keputusan eksperimen, garam X ialah

A Zinc chloride
Zink klorida
B Calcium carbonate
Kalsium karbonat
C Aluminium sulphate
Aluminium sulfat
D Magnesium chloride
Magnesium klorida

11 Which of the following ions form a white precipitate that dissolves in excess sodium

hydroxide solution?
Antara ion-ion berikut yang manakah membentuk mendakan putih yang larut dalam larutan natrium hidroksida berlebihan?

I Al^{3+}
II Mg^{2+}
III Pb^{2+}
IV Zn^{2+}

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

12 Diagram 1 shows the apparatus set-up for an experiment to prepare ammonium sulphate salt.
Rajah 1 menunjukkan susunan radas bagi satu eksperimen untuk menyediakan garam ammonium sulfat.

Diagram 1
Rajah 1

What is the percentage composition by mass of nitrogen in the salt?
[Relative atomic mass : H,1 ; N,14 ; O,16 ; S,32]
Apakah peratus komposisi mengikut jisim bagi nitrogen dalam sampel baja itu?
[Jisim atom relatif : H,1 ; N,14 ; O,16 ; S,32]

A 21.54%

B 21.21%
C 12.28%
D 12.38%

13 Which of the following ions will produce white precipitate that is insoluble in excess aqueous ammonia solution?
Antara ion berikut, yang manakah akan menghasilkan mendakan putih yang tidak larut dalam ammonia akueus berlebihan?

I Mg^{2+}
II Ca^{2+}
III Pb^{2+}
IV Al^{3+}

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

14 The following information shows the properties of salt X.
Maklumat berikut menunjukkan sifat-sifat garam X.

-Releases brown gas and a gas which lights up glowing splinter when heated strongly - *Membebaskan gas perang dan gas yang menyalakan kayu uji berbara apabila dipanaskan dengan kuat* -Residue after heating is brown when it is hot and yellow when it is cold - *Menghasilkan baki yang berwarna perang semasa panas dan kuning semasa sejuk*

Diagram 9
Rajah 9

What is salt X?
Apakah garam X?

A Zinc nitrate
Zink nitrat
B Zinc carbonate
Zink karbonat
C Lead(II) nitrate
Plumbum(II) nitrat
D Lead(II) carbonate
Plumbum(II) karbonat

15 Which of the following substances are suitable to prepare copper (II) chloride?
Di antara bahan berikut yang manakah sesuai untuk menyediakan kuprum(II) *klorida?*

I Copper metal and hydrochloric acid
Logam kuprum dan asid hidroklorik
II Copper(II) nitrate and sodium chloride
Kuprum (II) *nitrat dan natrium klorida*
III Copper(II) oxide and hydrochloric acid
Kuprum (II) *oksida dan asid hidroklorik*
IV Copper(II) carbonate and hydrochloric acid
Kuprum (II) *karbonat dan asid hidroklorik*

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

16 Which of the following ions form an insoluble white precipitate in excess aqueous ammonia?
Di antara ion-ion berikut akan membentuk mendakan putih tak terlarut dalam larutan akues ammonia berlebihan?

I. Ca^{2+}
II. Pb^{2+}
III. Zn^{2+}
IV. Mg^{2+}

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

17 Which of the following salts can be prepared by precipitation reaction?
Di antara garam yang berikut, yang manakah boleh disediakan melalui tindak balas pemendakan?

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

18 Which of the following compounds is a soluble salt?

Di antara sebatian berikut yang manakah garam terlarutkan?

A Calcium chloride
Kalsium klorida
B Barium sulphate
Barium sulfat
C Lead (II) iodide
Plumbum (II) iodida
D Magnesium carbonate
Magnesium karbonat

19 Which of the following is insoluble salts?
Di antara berikut, yang manakah garam tak terlarutkan?

A Sodium carbonate
Natrium karbonat
B Zinc chloride
Zink klorida
C Silver nitrate
Argentum nitrat
D Silver chloride
Argentum klorida

20 Which of the following is a coloured salt?
Di antara berikut yang manakah suatu garam berwarna?

A Iron (II) sulphate
Ferum (II) sulfat
B Silver nitrate
Argentum nitrat
C Lead (II) nitrate
Plumbum (II) nitrat
D Calcium carbonate
Kalsium karbonat

21 Which is a soluble salt?
Yang manakah suatu garam terlarutkan?

A Copper(II) carbonate
Kuprum(II) *karbonat*
B Lead(II) sulphate
Plumbum(II) *sulfat*
C Silver chloride
Argentum klorida
D Iron(II) nitrate
Ferum(II) *nitrat*

22 Which of the following salt is **soluble** in water?

*Di antara berikut, manakah garam **larut** dalam air?*

A Iron(II) sulphate
Ferum(II) sulfat
B Silver chloride
Argentum klorida
C Calcium carbonate
Kalsium karbonat
D Lead(II) bromide
Plumbum(II) bromida

23 Diagram below shows the set-up of the apparatus of an experiment.
Rajah di bawah menunjukkan susunan radas bagi satu eksperimen.

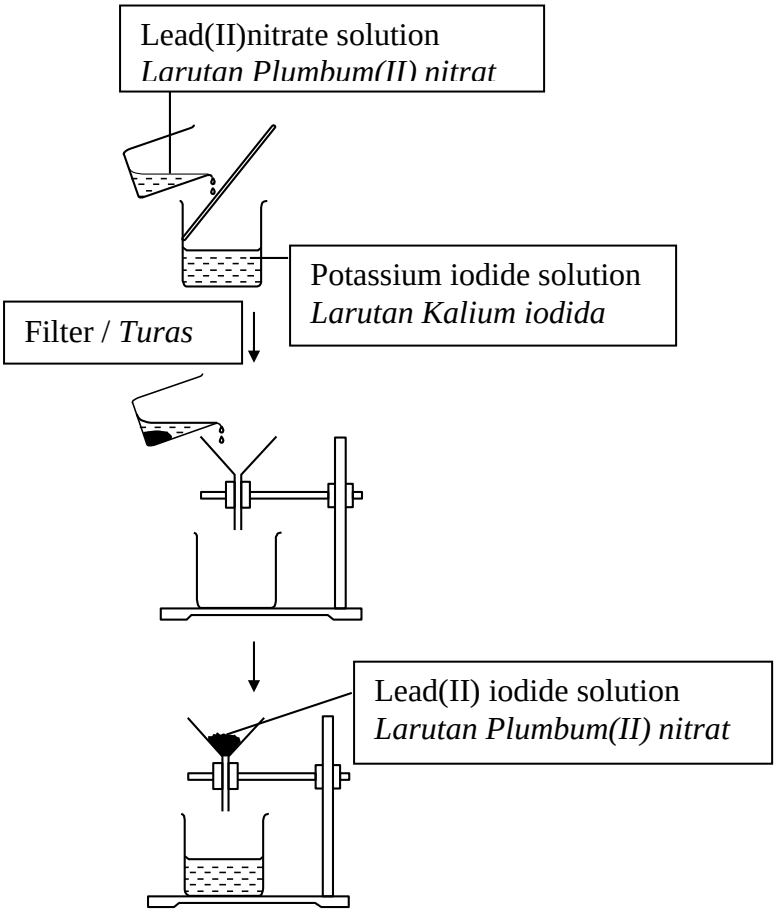

Diagram 10
Rajah 10

What is the process shown in diagram 10?
Apakah proses yang ditunjukkan dalam rajah 10?

A Preparation of insoluble salt
Penyediaan garam tak terlarutkan
B Preparation of soluble salt
Penyediaan garam terlarutkan
C Purification of insoluble salt
Penulenan garam tak terlarutkan
D Purification of soluble salt
Penulenan garam terlarutkan

24 Which substance is a salt?
Di antara berikut, bahan manakah suatu garam?

A Zinc oxide
Zink oksida
B Calcium sulphide
Kalsium sulphida
C Magnesium chloride
Magnesium klorida
D Aluminium hydroxide
Aluminium hidroksida

25 Which salt solution is colourless?
Di antara berikut, larutan garam manakah tidak berwarna?

A Iron(III) sulphate
Besi(III) sulfat
B Aluminium nitrate
Aluminium nitrat
C Copper(II) chloride
Kuprum(II) klorida
D Potassium dichromate (VI)
Kalium dikromat (VI)

26. Table 4 shows the observations when a series of tests are conducted to verify the anion and cation in a compound X.
Jadual 4 menunjukkan pemerhatian apabila satu siri ujian dijalankan bagi mengesahkan anion dan kation dalam sebatian X.

Test *Ujian*	Observation *Pemerhatian*
Add a few drops of ammonia solution until excess to solution of X *Tambah beberapa titik larutan ammonia sehingga berlebihan kepada larutan X*	White precipitate is formed and it is soluble in excess ammonia solution *Mendakan putih terbentuk dan larut dalam larutan ammonia berlebihan*
Add solution of X to silver nitrate solution *Tambah larutan X kepada larutan argentum nitrat*	White precipitate is formed *Mendakan putih terbentuk*

Table 3
Jadual 3

What are the anion and cation present in compound X?

Apakah anion dan kation yang hadir dalam sebatian X?

	Anion Anion	Cation Kation
A	Chloride ion Ion klorida	Lead(II) ion Ion Plumbum(II)
B	Chloride ion Ion klorida	Zinc ion Ion Zink
C	Sulphate ion Ion sulfat	Zinc ion Ion Zink
D	Sulphate ion Ion sulfat	Lead(II) ion Ion Plumbum(II)