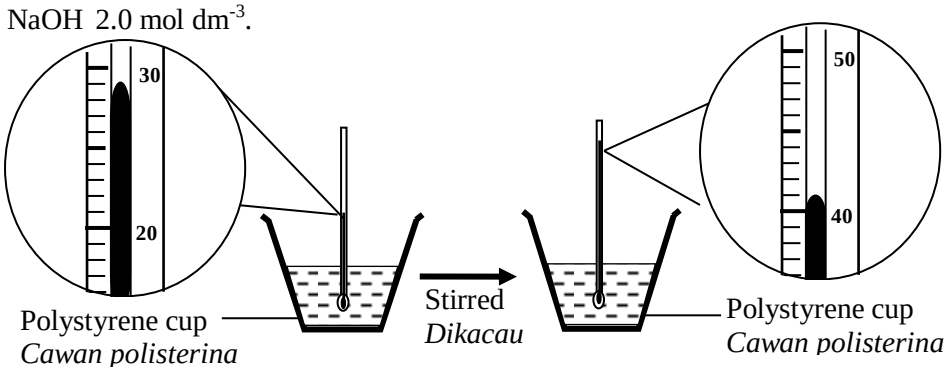
Answer **all** questions.
*Jawab **semua** soalan.*

1 Diagram 1 shows two experiments to study the heat of neutralization between hydrochloric acid and two different types of alkali.
Rajah 1 *menunjukkan dua eksperimen untuk mengkaji haba peneutralan antara asid hidroklorik dan dua jenis alkali yabg berbeza.*

Experiment I
***Eksperimen* I**

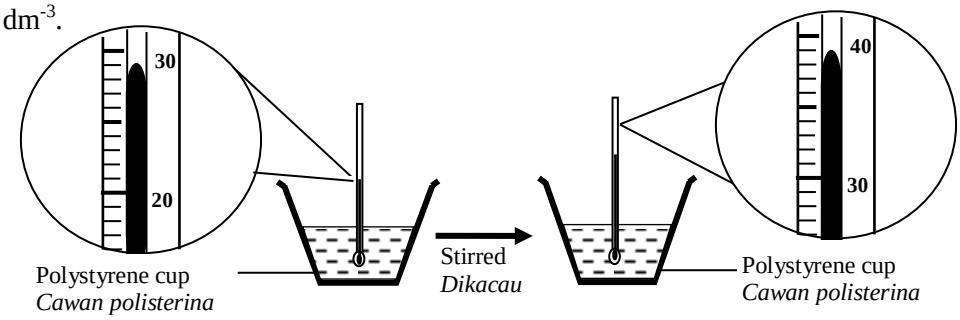
Reaction between 25 cm^3 of 2.0 mol dm^{-3} hydrochloric acid, HCl and 25 cm^3 of 2.0 mol dm^{-3} sodium hydroxide solution, NaOH .
Tindakbalas antara 25 cm^3 *asid hidroklorik,* HCl 2.0 mol dm^{-3} *dan* 25 cm^3 *larutan natrium hidroksida,* NaOH 2.0 mol dm^{-3}.



Initial temperature of the mixture : …… °C
Suhu awal campuran :
Highest temperature of the mixture : …… °C
Suhu tertinggi campuran :
Change in temperature : …… °C
Perubahan suhu :

Experiment II
***Eksperimen* II**

Reaction between 25 cm^3 of 2.0 mol dm^{-3} hydrochloric acid, HCl and 25 cm^3 of 2.0 mol dm^{-3} ammonia solution.
Tindakbalas antara 25 cm^3 *asid hidroklorik,* HCl 2.0 mol dm^{-3} *dan* 25 cm^3 *larutan ammonia* 2.0 mol dm^{-3}.



Initial temperature of the mixture : …… °C
Suhu awal campuran :
Highest temperature of the mixture : …… °C
Suhu tertinggi campuran :
Change in temperature : …… °C
Perubahan suhu :

Diagram 1/ *Rajah* 1

For examiner's use

(a) Write the initial and the highest temperature of the mixture and the change in temperature for Experiment I and II in Diagram 1.
Tulis suhu awal dan suhu tertinggi campuran serta perubahan suhu untuk Eksperimen 1 *dan* II *dalam Rajah* 1.

1(a) 3

[3 *marks*]

(b) Based on the results in Diagram 1, state the relationship between the temperature change and the
(c) type of alkali that react with hydrochloric acid.
Berdasarkan keputusan dalam Rajah 1, *nyatakan hubungan antara perubahan suhu dengan jenis alkali yang bertindak balas dengan asid hidroklorik.*

1(b)

…….

…….

3 [3 *marks*]

(d) State **one** hypothesis for both experiments.
*Nyatakan **satu** hipotesis bagi kedua-dua eksperimen.*

1(c)

…….

…….

3 *marks*]

(e) Based on the experiment, state
Berdasarkan eksperimen, nyatakan

(i) the manipulated variable.
pemboleh ubah yang dimanipulasikan.

…….....

(ii) the responding variable.
pemboleh ubah yang bergerak balas.

…….....

(iii) the constant variable.
pemboleh ubah yang ditetapkan.

1(d)

…… 3 *marks*]

For examiner's use

(f) (i) Based on the result in Diagram 1, calculate the heat of neutralisation of Experiment I and II .
Berdasarkan keputusan dalam dalam rajah 1, hitungkan haba peneutralan. bagi Eksperimen I dan II.
[heat capacity of water: 4.2 $Jg^{-1}{}^{0}C^{-1}$,

Experiment I
Eksperimen I

Experiment II
Eksperimen II

1(e)

3

[3 *marks*]

(ii) Based on your answer in e(i) and diagram 1, state the operational definition for the heat of neutralisation.
Berdasarkan jawapan dalam e(i) dan Rajah 1,nyatakan definisi secara operasi untuk tindak balas peneutralan..

…….

……..

(g) Based on the temperatures in Experiment II, predict the change in temperature if hydrochloric acid is replaced by ethanoic acid.
Berdasarkan suhu dalam Eksperimen II, *ramalkan perubahan suhu jika asid hidroklorik digantikan dengan asid etanoik.*

…….

1(f)

3

marks]

Total 1

21

2 A student carried out an experiment to determine the empirical formula of lead oxide.
One of the steps during the experiment is weighing the combustion tube as shown in Diagram 2.

Seorang pelajar telah menjalankan satu eksperimen untuk menentukan formula empirik plumbum oksida. Salah satu daripada langkah-langkah semasa menjalankan eksperimen ini ialah penimbangan tiub pembakaran seperti yang ditunjukkan dalam Rajah 2.

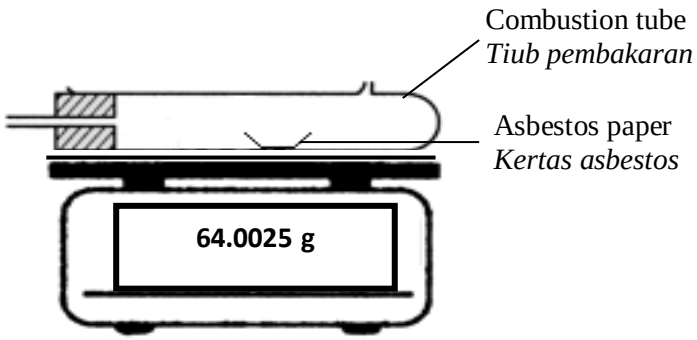
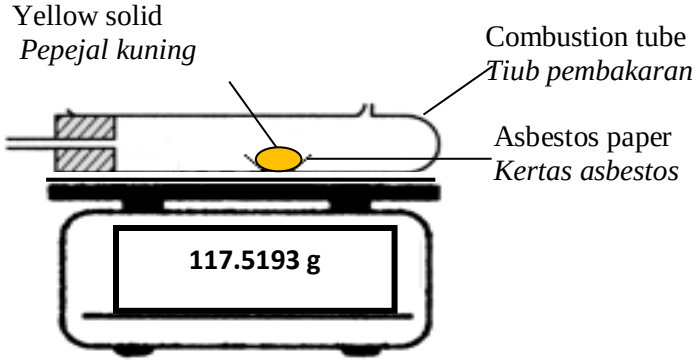
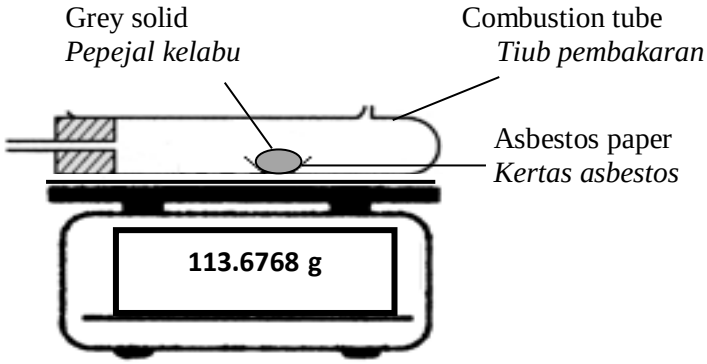
Step *Langkah*	Set-up of apparatus *Susunan radas*
1	
2	
3	

Diagram 2
Rajah 2

For examiner's use

(a) (i) State **one** observation in the experiment.
*Nyatakan **satu** pemerhatian dalam eksperimen ini.*

…….....

…….....

1(a)(i)

3 *marks*]

(ii) Give **one** inference based on your answer in (a) (i).
*Berikan **satu** inferens berdasarkan jawapan anda di* (a) (i).

…….....

…….....

1(a)(ii)

3 *marks*]

(b) Determine the empirical formula of lead oxide.
Given the relative atomic mass of Pb = 207 and O = 16
Tentukan empirikal formula bagi plumbum oksida.
Diberi jisim atom relatif bagi Pb = 207 *dan* O = 16.

1(b)

3 *marks*]

For examiner's use

(c)

$C_6H_{12}O_6$	C_3H_6
$C_2H_4O_2$	CH
CH_2	CH_2O

Classify the chemical formulae given into empirical formula and molecular formula.
Kelaskan formula kimia yang diberi kepada formula empirik dan formula molekul.

Empirical formula ***Formula empririk***	**Molecular formula** ***Formula molekul***

[3 *marks*]

1(c)

3

12

3 Table 3.1 shows a conversation between a teacher and two students after attending a school activity near the beach.
Jadual 3.1 menunjukkan perbualan antara seorang guru dengan dua orang pelajar selepas menghadiri aktiviti sekolah berdekatan dengan pantai.

Teacher: Hei Naim!!…why is your shirt looks dirty while Naqib's shirt looks clean?
Hei Naim!…kenapa baju awak nampak comot sedangkan baju Naqib nampak bersih?

Naim: Teacher….when we were at the beach, I washed my shirt using soap while Naqib used detergent.
Cikgu…. ketika kami di pantai saya basuh baju menggunakan sabun sedangkan Naqib menggunakan detergen.

Naqib*:* That's correct
Betul…betul

https://cikguadura.wordpress.com/

Table 3.1
Jadual 3.1

Referring to the above conversation, plan a laboratory experiment to compare the effectiveness of soap and detergent in sea water.

Merujuk kepada perbualan di atas, rancang satu eksperimen untuk membandingkan keberkesanan sabun dan detergen dalam air laut.

Your planning should include the following:
Perancangan anda haruslah mengandungi perkara-perkara berikut :

(a) Statement of problem
Pernyataan masalah

(b) All the variables
Semua pembolehubah

(c) Statement of hypothesis
Pernyataan hipotesis

(d) List of substances and apparatus
Senarai bahan dan alat radas

(e) Procedure of the experiment
Prosedur eksperimen

(f) Tabulation of data
Penjadualan data

[17 *marks*]
[17 *markah*]

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1.This question paper consists of three questions: Question 1 , Question 2 and Question 3.
Kertas soalan ini mengandungi tiga soalan: Soalan 1, Soalan 2 dan Soalan 3.

2.Answer all questions. Write your answers for Question 1 and 2 in the spaces provided in this question paper.
Jawab semua soalan. Jawapan anda bagi Soalan 1 dan 2 hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.

3.Write your answers for Question 3 on the 'helaian tambahan' provided by the invigilators. You may use equations, diagrams, tables, graphs and other suitable methods to explain your answers.
Jawapan anda bagi Soalan 3 hendaklah ditulis dalam helaian tambahan yang dibekalkan oleh pengawas peperiksaan. Anda boleh menggunakan persamaan, rajah, jadual, graf dan cara lain sesuai untuk menjelaskan jawapan anda.

4.Show your working, it may help you to get marks.
Tunjukkan kerja mengira, ini membantu anda mendapatkan markah.

5.The diagrams in the questions are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

6.Marks allocated for each question or sub-part of a question is shown in brackets.
Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.

7.If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

8.You may use non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

9.You are advised to spend 45 minutes to answer Question 1 and 2 and 45 minutes for Question 2.
Anda dinasihati supaya mengambil masa 45 minit untuk menjawab Soalan 1 dan 2 dan 45 minit untuk Soalan 2.

10.Tie the 'helaian tambahan' together with this question paper and hand in to the invigilator at the end of the examination.
Ikat helaian tambahan bersama-sama kertas soalan ini dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.