

Based on the equation above, answer the following questions.
 Berdasarkan persamaan di atas, jawab soalan-soalan berikut.

- i) What is the name of the process?
 Apakah nama proses tersebut?

.....
 [1 mark]

- ii) What is alkali X?
 Apakah alkali X?

.....
 [1 mark]

- iii) Why is sodium chloride solution added to the mixture?
 Mengapakah larutan natrium klorida ditambahkan kepada campuran?

.....
 [1 mark]

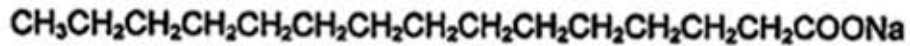
- iv) Describe briefly the cleansing action of soap.
 Huraikan dengan ringkas tindakan pembersihan oleh sabun

.....

 [2 marks]

- c) Diagram 6 shows the structural formulae of two cleansing agents X and Y.
Rajah 6 menunjukkan formula struktur bagi dua agen pembersih X dan Y.

Cleansing agent X:
Agen pembersih X :



Cleansing agent Y:
Agen pembersih Y :

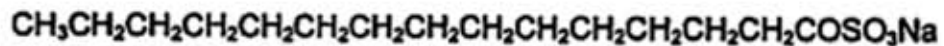


Diagram 6
Rajah 6

Based on Diagram 6, compare the effectiveness of cleansing action of agent Y to agent X. Explain why.
Berdasarkan Rajah 6, bandingkan keberkesanan tindakan pembersihan agen pencuci Y berbanding agen X. Terangkan mengapa.

i.

.....

ii.

.....

[2 marks]

[Lihat sebelah

Section B
Bahagian B

[20 marks]

Answer any one question from this section.
Jawab mana-mana satu soalan daripada bahagian ini.

- 7 Diagram 7 shows parts of the Periodic Table of elements.
Rajah 7 menunjukkan sebahagian unsur dalam Jadual Berkala.

	1	2		13	14	15	16	17	18
					C		O		
		Mg		Al				Cl	

Diagram 7
Rajah 7

- (a) Write the electron arrangements for aluminium ion and oxide ion.
Tuliskan susunan elektron bagi ion aluminium dan ion oksida [2 marks]
- (b) Describe the formation of the following chemical bonds and draw the electron arrangement of compounds formed.
Huraikan pembentukan bagi ikatan kimia berikut dan lukis susunan elektron bagi sebatian yang terbentuk.
- (i) Ionic bond between magnesium atom and chlorine atom.
Ikatan ionik di antara atom magnesium dengan atom klorin. [5 marks]
- (ii) Covalent bond between carbon atom and chlorine atom.
Ikatan kovalen di antara atom karbon dengan atom klorin. [5 marks]
- (c) Explain each of the following statements.
Terangkan setiap pernyataan berikut.
- (i) Compound formed in (b)(i) can conduct electricity in the molten state while compound formed in (b)(ii) cannot conduct electricity in any state.
Sebatian yang terbentuk dalam (b)(i) boleh menghantarkan elektrik dalam keadaan leburan manakala sebatian yang terbentuk dalam (b)(ii) tidak dapat menghantarkan elektrik dalam semua keadaan.

[4 marks]

- (ii) The melting and boiling points for compound in (b)(i) is higher than compound in (b)(ii).
Takat lebur dan takat didih bagi sebatian dalam (b)(i) lebih tinggi daripada sebatian dalam (b)(ii).

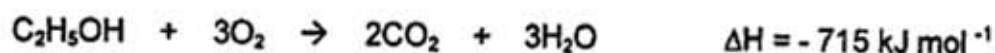
[4 marks]

- 8 Table 8 shows the heat of combustion of the first five alcohols.
Jadual 8 menunjukkan haba pembakaran untuk lima alkohol yang pertama.

Alcohol / Alkohol	Molecular Formula / Formula molekul	Heat of Combustion / Haba Pembakaran kJ mol ⁻¹
Methanol Metanol	CH ₃ OH	- 715
Ethanol Etanol	C ₂ H ₅ OH	- 1376
Propanol Propanol	C ₃ H ₇ OH	- 2017
Butanol Butanol	C ₄ H ₉ OH	- 2675
Pentanol Pentanol	C ₅ H ₁₁ OH	m

Table 8
 Jadual 8

The chemical equation for the combustion of ethanol is as below.
Persamaan kimia bagi pembakaran etanol adalah seperti di bawah.

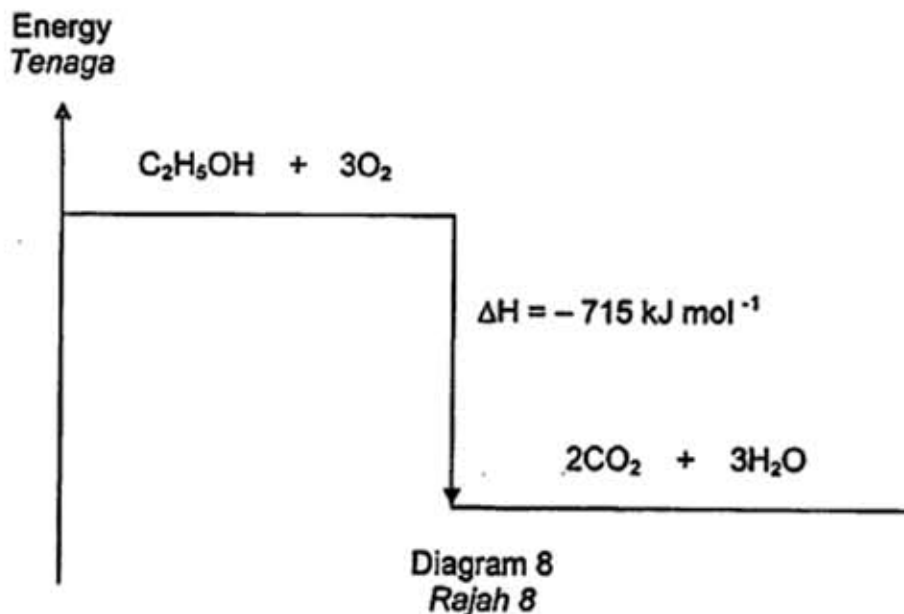


- (a) Based on the equation above, state the meaning of heat of combustion of ethanol.
Berdasarkan persamaan kimia di atas, nyatakan maksud haba pembakaran bagi etanol.
- [2 marks]
- (b) Based on Table 8 ,
Berdasarkan Jadual 8 ,
- (i) Draw a graph of magnitude of heat of combustion against the number of carbon atoms.
Lukis graf magnitud haba pembakaran melawan bilangan atom karbon.

[3 marks]

[Lihat sebelah]

- (ii) State the relationship between the number of carbon atoms per molecule of alcohol to the magnitude of the heat of combustion.
Nyatakan hubungan di antara bilangan atom karbon per molekul alkohol kepada magnitud haba pembakaran. [1 mark]
- (iii) From the graph, predict the heat of combustion of pentanol in kJ mol^{-1}
Daripada graf, ramalkan haba pembakaran pentanol dalam kJ mol^{-1} [2 marks]
- (c) Compare the heat of combustion between ethanol and butanol.
Explain why there is a difference in the heat of combustion between ethanol and butanol.
Bandingkan haba pembakaran etanol dengan butanol.
Terangkan mengapa terdapat perbezaan di antara haba pembakaran etanol dan butanol. [4 marks]
- (d) Diagram 8 shows the energy level diagram of the heat of combustion of ethanol.
Rajah 8 menunjukkan gambarajah aras tenaga bagi haba pembakaran etanol.



- (i) Give four information that you can obtain from Diagram 8.
Berikan empat maklumat yang boleh diperolehi daripada Rajah 8. [4 marks]
- (ii) Calculate the energy released if 6.9 grams of ethanol is burnt completely in air.
Kira haba yang di bebaskan jika 6.9 gram etanol di bakar dengan lengkap di dalam udara. [4 marks]

Section C
Bahagian C

[20 marks]

Answer any one question from this section.
Jawab mana-mana satu soalan daripada bahagian ini.

- 9 (a) By using suitable example, explain what are meant by empirical formula and molecular formula.
Dengan menggunakan contoh yang sesuai, terangkan apa yang dimaksudkan dengan formula empirik dan formula molekul.

[3 marks]

- (b) The information below is for compound Q
Maklumat berikut adalah bagi sebatian Q.

• Carbon <i>Karbon</i>	40.00%
• Hydrogen <i>Hidrogen</i>	6.66%
• Oxygen <i>Oksigen</i>	53.33%
• Relative molecular mass <i>Jisim molekul relatif</i>	180

Based on the information of compound Q, determine:
Berdasarkan maklumat bagi sebatian Q, tentukan:

- (i) The empirical formula
Formula empiriknya
- (ii) The molecular formula
Formula molekulnya
[Relative atomic mass: C, 12; H, 1; O, 16]
[*Jisim atom relatif: C, 12; H, 1; O, 16*]

[5 marks]

[Lihat sebelah

- (c) Diagram 9 shows the set-up of apparatus to determine the empirical formula of two different compounds.

Rajah 9 menunjukkan susunan radas bagi menentukan formula empirik dua sebatian yang berlainan.

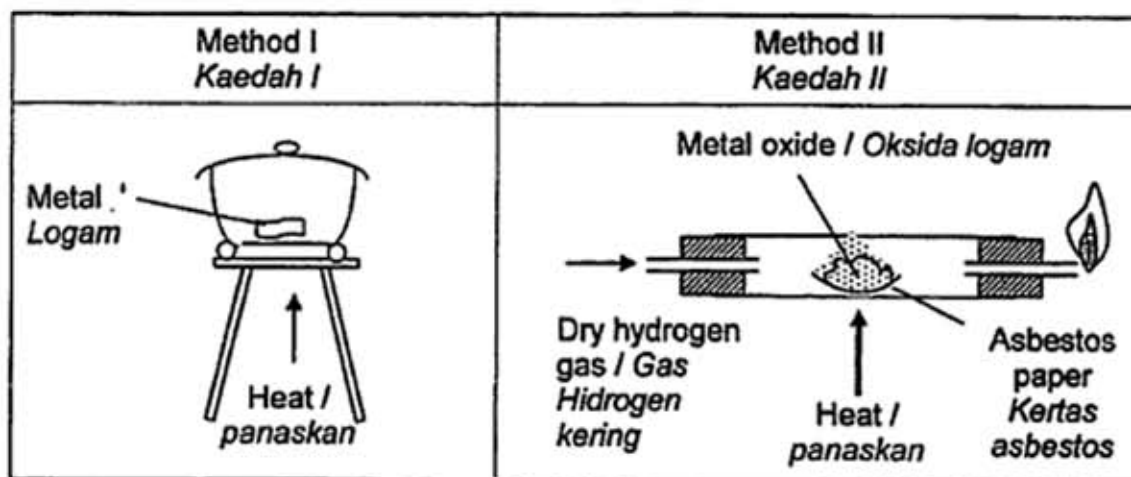


Table 9
Rajah 9

- (i) Explain why method II is not suitable to determine the empirical formula of magnesium oxide?
Terangkan mengapa kaedah II tidak sesuai bagi menentukan formula empirik bagi magnesium oksida?
- [1 mark]
- (ii) Suggest one metal oxide in method II.
Cadangkan satu oksida logam dalam kaedah II.
- [1 mark]
- (iii) Using a suitable example, describe a laboratory experiment to determine the empirical formula of an oxide of a reactive metal. Your explanation should include:
Dengan menggunakan contoh yang sesuai, huraikan suatu eksperimen di makmal untuk menentukan formula empirik bagi suatu oksida logam reaktif.. Penerangan anda mestilah meliputi :
- Procedure of the experiment
Prosedur bagi eksperimen
 - Tabulation of data
Penjadualan data

[10 marks]

- 10 (a) Table 10 shows different concentrations of hydrochloric acid and the corresponding pH values.
Jadual 10 menunjukkan kepekatan berlainan bagi asid hidroklorik dan nilai pH yang sepadan.

Hydrochloric Acid <i>Asid hidroklorik</i>	Concentration of hydrochloric acid <i>Kepekatan asid hidroklorik</i> mol dm^{-3}	pH
A	0.001	3
B	0.01	2
C	0.1	1
D	1	0

Table 10
Jadual 10

- (i) Based on Table 10, state the relationship between the concentration of hydrochloric acid and the pH value.
Berdasarkan Jadual 10, nyatakan hubungan antara kepekatan asid hidroklorik dan nilai pH.
- (ii) Explain your answer in a (i) by referring to the number of hydrogen ions present in the acid.
Jelaskan jawapan anda di a (i) dengan merujuk kepada bilangan ion hidrogen yang terdapat dalam asid itu.
- (iii) Arrange the hydrochloric acids in Table 10 according to increasing order of acidity.
Susun asid hidroklorik dalam Jadual 10 menurut susunan menaik keasidan.

[4 marks]

[Lihat sebelah

- (b) The following information is about two different alkalis.
Maklumat di bawah adalah mengenai dua alkali yang berlainan.

Alkali <i>Alkali</i>	Concentration /mol dm ⁻³ <i>Kepekatan /mol dm⁻³</i>	pH <i>pH</i>
Sodium hydroxide solution <i>Larutan natrium hidroksida</i>	0.1	13
Ammonia solution <i>Larutan ammonia</i>	0.1	10

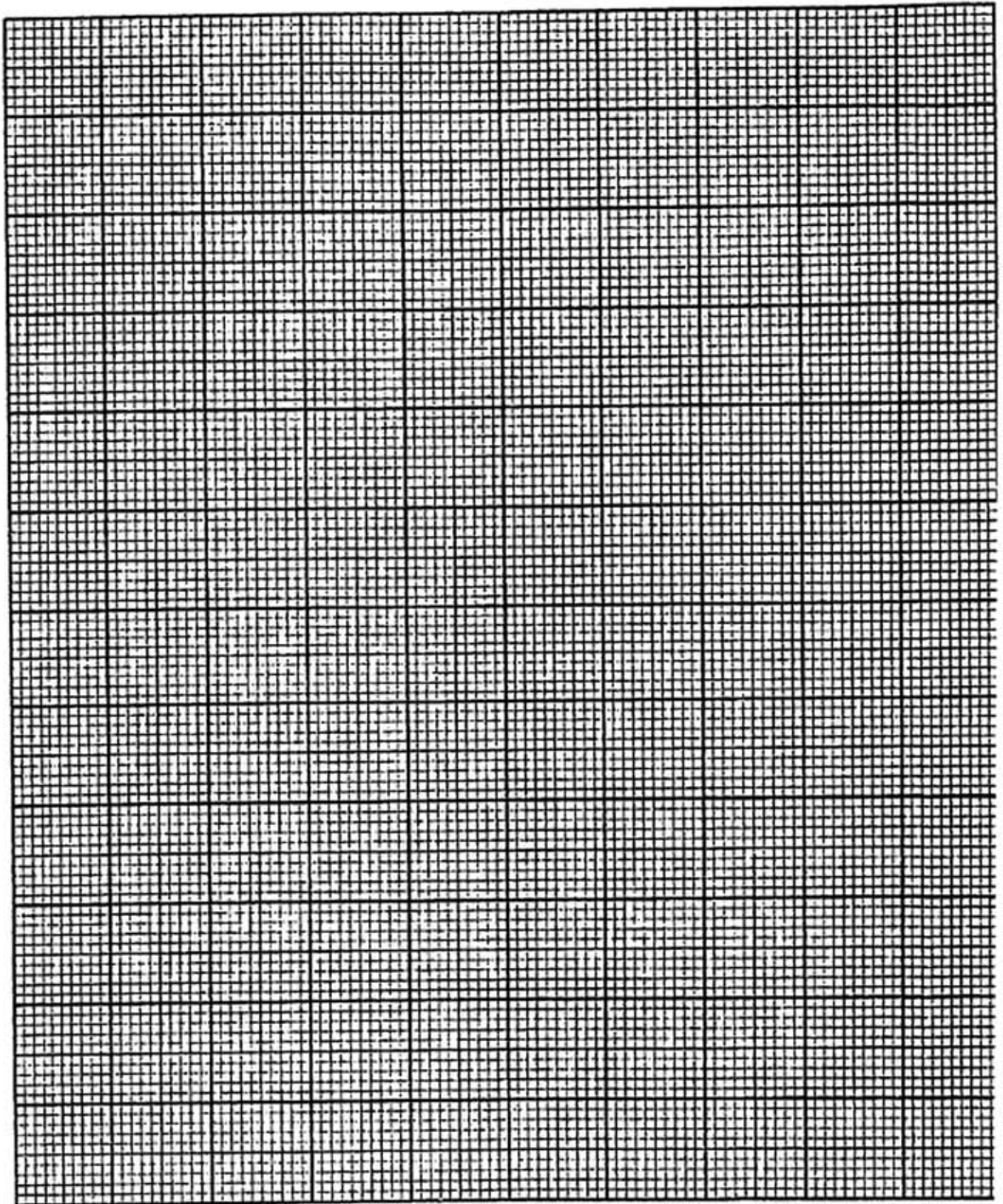
Explain why the two alkalis have different pH values.
Terangkan mengapa dua alkali tersebut mempunyai nilai pH yang berlainan.

[6marks]

- (c) You are required to prepare dry barium sulphate salt.
Anda dikehendaki menyediakan garam barium sulfat kering.
- (i) Suggest two solutions to prepare barium sulphate salt.
Cadangkan dua larutan untuk menyediakan garam barium sulfat.
- (ii) Describe a laboratory experiment to prepare the salt. In your description, include the chemical equation and ionic equation.
Huraikan suatu eksperimen makmal untuk menyediakan garam tersebut..Huraian anda mesti mengandungi persamaan kimia dan persamaan ion.

[10marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT



[Lihat sebelah

PERIODIC TABLE OF THE ELEMENTS

1 H Hydrogen 1		2 He Helium 4		3 Li Lithium 7		4 Be Beryllium 9		5 B Boron 11		6 C Carbon 12		7 N Nitrogen 14		8 O Oxygen 16		9 F Fluorine 19		10 Ne Neon 20																																					
11 Na Sodium 23		12 Mg Magnesium 24		13 Al Aluminium 27		14 Si Silicon 28		15 P Phosphorus 31		16 S Sulfur 32		17 Cl Chlorine 35.5		18 Ar Argon 40		19 K Potassium 39		20 Ca Calcium 40																																					
37 Rb Rubidium 85		38 Sr Strontium 88		39 Y Yttrium 89		40 Zr Zirconium 91		41 Nb Niobium 93		42 Mo Molybdenum 96		43 Tc Technetium 98		44 Ru Ruthenium 101		45 Rh Rhodium 103		46 Pd Palladium 106																																					
55 Cs Cesium 133		56 Ba Barium 137		57 La Lanthanum 139		58 Ce Cerium 140		59 Pr Praseodymium 141		60 Nd Neodymium 144		61 Pm Promethium 145		62 Sm Samarium 150		63 Eu Europium 152		64 Gd Gadolinium 157																																					
87 Fr Francium 223		88 Ra Radium 226		89 Ac Actinium 227		90 Th Thorium 232		91 Pa Protactinium 231		92 U Uranium 238		93 Np Neptunium 237		94 Pu Plutonium 244		95 Am Americium 243		96 Cm Curium 247																																					
101 Md Mendelevium 258		102 Ds Darmstadtium 261		103 Nh Nihonium 286		104 Fl Flerovium 289		105 Uup Ununpentium 288		106 Uub Ununhexium 289		107 Uuq Ununseptium 290		108 Uuo Ununoctium 293		109 Uue Ununennium 296		110 Uuq Ununquadium 297																																					
111 Tl Thallium 204		112 Pb Lead 207		113 Bi Bismuth 209		114 Po Polonium 210		115 At Astatine 210		116 Lv Livermorium 293		117 Ts Tennessine 294		118 Og Oganesson 294		119 Uue Ununennium 296		120 Uuq Ununquadium 297																																					
29	Pr	Praseodymium	141	59	Pr	Praseodymium	141	60	Nd	Neodymium	144	61	Pm	Promethium	145	62	Sm	Samarium	150	63	Eu	Europium	152	64	Gd	Gadolinium	157	65	Tb	Terbium	159	66	Dy	Dysprosium	163	67	Ho	Holmium	165	68	Er	Erbium	167	69	Tm	Thulium	169	70	Yb	Ytterbium	173	71	Lu	Lutetium	175
90	Th	Thorium	232	91	Pa	Protactinium	231	92	U	Uranium	238	93	Np	Neptunium	237	94	Pu	Plutonium	244	95	Am	Americium	243	96	Cm	Curium	247	97	Bk	Berkelium	247	98	Cf	Californium	251	99	Es	Einsteinium	252	100	Fm	Fermium	257	101	Md	Mendelevium	258	102	No	Nobelium	259	103	Lr	Lutetium	260

