MPP3
SPM 2023
4541/3 CHEMISTRY Paper 3

Soalan 1 / *Question* 1
15 markah / 15 *marks*

<table>
<tr><th colspan="2">No. Soalan
Question Number</th><th>Rubrik
Rubric</th><th>Markah
Marks</th></tr>
<tr><td>1</td><td>(a)</td><td>[Dapat merekod suhu berdasarkan kriteria berikut dengan betul]
[Able to record temperature based on the following criteria correctly]

i. Satu tempat perpuluhan bagi set I dan set II
ii. Bacaan bagi suhu awal bagi set I dan set II
iii. Suhu purata bagi set I dan set II
iv. Suhu tertinggi bagi set I dan set II

i. One decimal place for set I and set II
ii. Readings for the initial temperature of set I and set II
iii. Average temperature for set I and set II
iv. The highest temperature for set I and set II

i dan ii / i and ii
iii dan iv / iii and iv

<u>Contoh jawapan:</u>
<u>Sample answer :</u>
<table>
<tr><th colspan="2">Set/ Set</th><th>Suhu awal (°C)
Initial temperature
(°C)</th><th>Suhu tertinggi
(°C)
Highest temperature(°C)</th></tr>
<tr><td rowspan="3">I</td><td>Larutan plumbum(II) nitrat
0.5 mol dm^{-3}

0.5 mol dm^{-3}
lead(II) nitrate solution</td><td>[24.0 - 32.0]</td><td rowspan="3"></td></tr>
<tr><td>Larutan kalium iodida
0.5 mol dm^{-3}

0.5 mol dm^{-3}
potassium iodide solution</td><td>[24.0 - 32.0]</td></tr>
<tr><td>Suhu purata (°C)
Average temperature (°C)</td><td>[24.0 - 32.0]</td></tr>
<tr><td rowspan="2">II</td><td>Larutan plumbum(II) nitrat
1.0 mol dm^{-3}

1.0 mol dm^{-3}
lead(II) nitrate solution</td><td>[24.0 - 32.0]</td><td rowspan="2"></td></tr>
<tr><td>Larutan kalium iodida
1.0 mol dm^{-3}

1.0 mol dm^{-3}</td><td>[24.0 - 32.0]</td></tr>
</table>
</td><td>1
1</td></tr>
</table>

No. Soalan *Question Number*		Rubrik *Rubric*	Markah *Marks*

	potassium iodide solution		
	Suhu purata (°C) *Average temperature* (°C)	[24.0 - 32.0]	

Nota/ *Notes*:

- Perbezaan suhu set I lebih kecil berbanding set II
- Bacaan suhu tertinggi set I lebih rendah dari set II
- *The temperature difference of set I is smaller than set II*
- *The highest temperature reading of set I is lower than set II*

b (i)

[Dapat menyatakan satu pemerhatian dalam set I dengan betul]
[Can state one observation in set I correctly]

Contoh jawapan:

1. Bacaan termometer berkurang//Suhu campuran lebih tinggi berbanding suhu awal
2. Mendakan kuning terhasil

Sample answer:

1. *The thermometer reading decreases//The temperature of the mixture is higher than the initial temperature*
2. *A yellow precipitate results*

b(ii)

[Dapat menyatakan inferens berdasarkan pemerhatian di 1b(i) dengan betul]
[Can state the inference based on the observations in 1b(i) correctly]

Contoh jawapan:

1. Tindak balas eksotermik berlaku// Haba di serap **dari persekitaran**
2. Garam tak terlarutkan terhasil// Plumbum(II) iodida terhasil

Sample answer:

1. *An exothermic reaction occurs// Heat is absorbed from the environment*
2. *Insoluble salt is produced//* Lead(II) iodide *is produced*

(c)

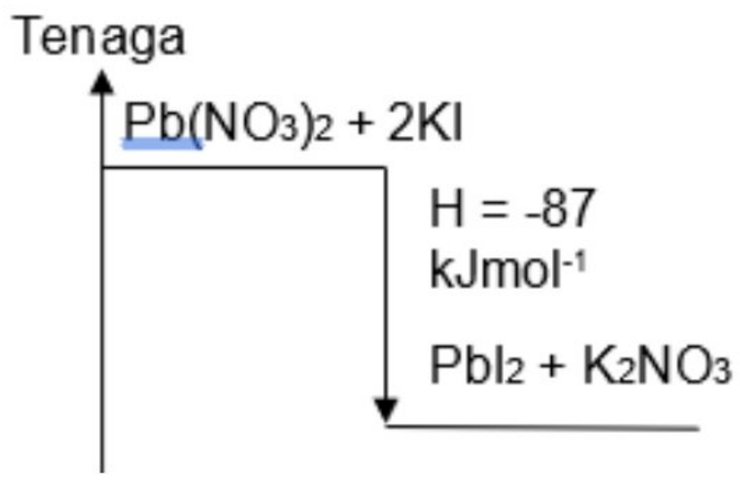
[Menyatakan semua pembolehubah dengan tepat]
Able to state all the three variables correctly;

Contoh jawapan:

Pembolehubah dimanipulasi: Kepekatan larutan plumbum(II) nitrat **dan** kalium iodida
Pembolehubah bergerakbalas : Suhu tertinggi// Perubahan suhu
*r : Haba pemendakan
Pembolehubah dimalarkan : Larutan plumbum(II) nitrat **dan** kalium iodida// Jenis larutan

3

No. Soalan *Question Number*		Rubrik *Rubric*	Markah *Marks*
		Sample answer: *Manipulated variable : Concentration of* lead(II) nitrate solution *and* potassium iodide *Responding variable : Highest temperature// Change in temperature* **r : Heat of Precipitation* *Constant variable : Lead(II) nitrate and potassium iodide solution* *// Type of solution*	
	(d)	[Dapat menyatakan hipotesis dengan betul berdasarkan kriteria berikut] *[Able to state the hypothesis correctly based on the following criteria]* 1. Hubungan pembolehubah manipulasi dan pembolehubah bergerakbalas 2. Arah *1. The relationship between the manipulation variable and the response variable* *2. Direction* Contoh jawapan: 1. Semakin tinggi kepekatan larutan plumbum(II) nitrat dan kalium iodida, semakin tinggi suhu campuran. *Sample answer:* *1. The higher the concentration of* lead(II) nitrate solution *and* potassium iodide solution, *the higher the temperature of the mixture.*	2
	(e)	[Dapat menyatakan definisi secara operasi mengikut kriteria berikut dengan betul] *Able to state the operational definition with following criteria correctly* 1. Apa yang perlu dibuat *What to do* — 1 2. Pemerhatian *What to observe* — 1 *Contoh jawapan :* 1. Apabila larutan plumbum(II) nitrat dicampur dengan larutan kalium iodida, suhu meningkat *Sample answer:* 1. *When a* lead(II) nitrate solution *is mixed with a* potassium iodide solution, *the temperature rises*	
	(f)	[Dapat melukis gambar rajah aras tenaga dengan betul berdasarkan kriteria berikut] *Able to draw an energy level diagram correctly based on the following criteria* 1. Paksi Y beserta tajuk 2. Aras tenaga bahan tindak balas lebih tinggi berbanding hasil tindak balas 3. Nilai bagi ΔH yang betul, -87 $kJmol^{-1}$	1

No. Soalan *Question Number*		Rubrik *Rubric*	Markah *Marks*
		1. *Y axis with title* 2. *The energy level of the reactants is higher than the products of the reaction* 3. *The value for the correct* ΔH, -87 $kJmol^{-1}$ <u>Contoh jawapan:</u> <u>*Sample answer*</u>*:*  	
	(g)	[Dapat membuat pengkelasan yang betul] *Able to make the correct classification* <u>Contoh jawapan:</u> <u>*Sample answer*</u>*:* Eksotermik / *Exothermic*: Pengaratan logam / *Corrosion of metal*; Pembakaran bunga api / *Burning of fireworks* Endotermik / *Endothermic*: Penguraian kalsium karbonat / *Decomposition of calcium carbonate*; Fotosintesis / *Photosynthesis*	1 1
		Jumlah / total	**15**

END OF MARKING SCHEME