SAMPEL PERCUMA

Skema Jawapan Trial STPM Kimia Semester 1

Set penuh: Kertas Percubaan STPM

Sem 1 · Kimia

Sampel ini: 4 muka surat. Set penuh ada:

- 2 fail PDF
- Semester 1: kertas percubaan (trial) negeri, subjek yang dipilih + skema
- Blueprint 30 hari Semester 1 (setiap subjek)
- Semester 3: percubaan 2024, 10 subjek, banyak negeri, soalan + skema dalam satu fail

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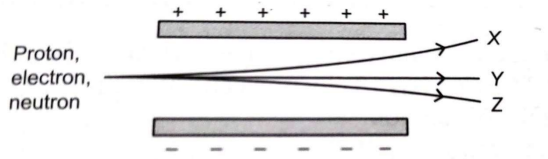
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Sampel bermula di muka surat sebelah

Section A
[15 marks]
Answer **all** questions in this section.

1. A beam of protons, electrons and neutrons is passed between two electrically charged plates.



Which of the following statements is **not** true?

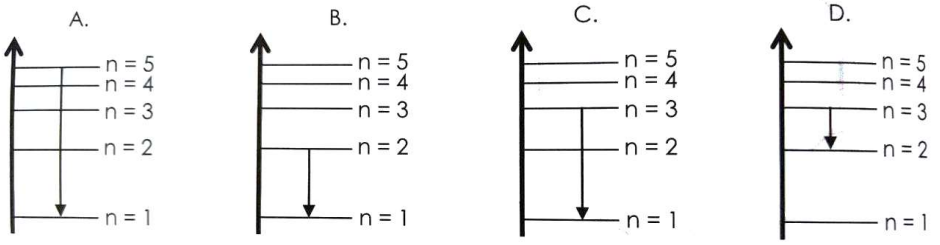
A X has a lower mass than Z.
B Y is larger in size than Z.
C X and Z have opposite charges.
D Y is electrically neutral.

2. Tanzanite is used as a gemstone for jewellery. It is a hydrated calcium aluminium silicate mineral with a chemical formula $Ca_2Al_xSi_yO_{12}(OH).6½\ H_2O$. Tanzanite has M_r of 571.5. The chemical composition is:
14.04% calcium, 14.17% aluminium, 14.75% silicon, 54.59% oxygen and 2.45% hydrogen.
(R.A.M.; H= 1.0, O = 16.0, Al = 27.0, Si = 28.1, Ca = 40.1)

What are the values of *x* and *y*?

	x	*y*
A	1	1
B	2	3
C	3	3
D	6	1

3. Transition of electrons between energy levels in an atom will cause an absorption or emission of lights. Which energy level diagram shows the transition of electrons that emits light with the longest wavelength?



Section B
[15 marks]
Answers **all** questions in this section.

Write the answers in the spaces provided.

16 (a) Ammnonia is a colourless gas with an unpleasant smell.

(i) Write a balanced equation for the formation of ammonia from calcium hydroxide.

[1 mark]

……

(ii) Draw the Lewis structure of the product formed from the reaction between ammonia and aluminium chloride. [1 mark]

(iii) State the change in the orbital hybridization of aluminium in the reaction. [1 mark]

……

(iv) The ammonia molecule NH_3 and the phosphine molecule PH_3 have trigonal pyramidal shapes. Explain the difference in their bond angles. [3 marks]

……
……
…….

SECTION C
[30 marks]

Answer **two** questions only.

You may answer all the questions but, only the first two answers will be marked. Write the answers on the answer sheets provided. Begin each answer on it new page of the answer sheet.

18. (a) Niels Bohr postulated that the energy ΔE is released in the form of light when there is a transition of electron between a higher energy level to a lower energy level.

(i) The Lyman and Balmer series in the atomic emission spectrum of hydrogen are formed when there is a transition of electrons between energy levels. Draw an energy level diagram that shows the formation of these two series.

[4 *marks*]

(ii) One of the lines in the Lyman series has a wavelength of 121.6 nm. Calculate the energy of this transition in Joules.

[5 *marks*]

[The Planck's constant, h, is 6.63×10^{-34} J s and the speed of light, c, is 3.00×10^{8} ms^{-1}]

(b) Hund's rule, Pauli exclusion principle and Aufbau principle are used to determine the ground state electronic configuration of an atom.

(i) State the rule and principles. [3 *marks*]

(ii) Describe how the two principles are applied to oxide ion, O^{2-}, as an example.

[3 *marks*]

19. (a) (i) Ammonium nitrate is an explosive compound and it decomposes at a high temperature according to the following equation.

$$2NH_4NO_3\ (s) \longrightarrow 4H_2O\ (g) + 2N_2\ (g) + O_2\ (g)$$

Calculate the total volume of gases collected from the decomposition of 100 g of ammonium nitrate at 1.01×10^{5} Pa and 25 °C. [3 *marks*]

(ii) Sketch a graph of $\frac{PV}{RT}$ against P for 1.0 mol of ammonia gas at 0 °C. Based on the graph sketched, explain the negative deviation of ammonia gas compared to an ideal gas.

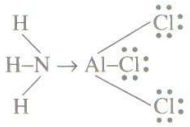
[4 *marks*]

Answer CHEMISTRY 962/P1 2023

Section A

1	B	**6**	D	**11**	A
2	C	**7**	B	**12**	C
3	D	**8**	B	**13**	D
4	C	**9**	A	**14**	C
5	C	**10**	A	**15**	B

Section B

No.	Answer	Mark
16	(a) (i) $Ca(OH)_2(s) + 2NH_4Cl(s) \longrightarrow 2NH_3(g) + CaCl_2 + 2H_2O(l)$	1
	(ii) 	1
	(iii) sp^2 to sp^3	1
	(iv) Bond angle NH_3 is greater/bigger than NH_3	1
	N is more electronegative than P	1
	N pulls bonding/shared electron pair closer causing greater repulsion between bonding pairs.	1
	(b) 	1
	Shape : bent/v-shaped	1
	Total	8 marks
17	(a)Allotrope is defined as an element that can exist in more than one form/structure in the same physical state	1
	(b)PV=nRT or PV=$\frac{mRT}{Mr}$ or Mr= $\frac{mRT}{PV}$ or = $\frac{(2.41 \times 8.31 \times 298)}{}$	1

TAMAT SAMPEL

Suka sampel ini?

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