Class / Tingkatan : ..... Name / Nama: .....

Identity card number: ..... Centre number/index number :.....
(Nombor kad pengenalan) (Nombor pusat/angka giliran)

962/1 **STPM 2019**

JABATAN PELAJARAN NEGERI KELANTAN

MODUL G-CAKNA

CHEMISTRY 1 2019
SET 1

One and a half hours (Satu jam setengah)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE)

For examiner"s use (Untuk kegunaan pemeriksa)	
Section A	
Section B (Bahagian B)	
16	
17	
Section C (Bahagian C)	
Total (Jumlah)	

Instructions to candidates:
DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.
There are **fifteen** questions in Section A. For each question, four choices of answers are given. Choose **one** correct answer and indicate it on the Multiple-choice Answer Sheet provided. Read the instructions on the Multiple-choice Answer Sheet very carefully. Answer **all** questions. Marks will not be deducted for wrong answers.
Answer **all** questions in Section B. Write your answers in the spaces provided. Answer any **two** questions in Section C. All essential working should be shown. For numerical answers, unit should be quoted wherever appropriate.
Begin each answer on a fresh sheet of paper and arrange your answers in numerical order.

Answers may be written in either English or Bahasa Malaysia.

Arahan kepada calon

JANGAN BUKA KERTAS SOLAN INI SEHINGGA ANDA DIBENARKAN BERBUAT DEMIKIAN
Ada **lima belas** soalan dalam Bahagian A. Bagi setiap soalan, empat pilihan jawapan diberikan.Pilih **satu** jawapan yang betul dan tandakan jawapan itu pada Borang Jawapan Aneka Pilihan yang dibekalkan. Baca arahan pada Borang Jawapan Aneka Pilihan itu dengan teliti. Jawab **semua** soalan.
Markah tidak akan ditolak bagi jawapan yang salah.
Jawab **semua** soalan dalam Bahagian B. Tulis jawapan anda di ruang yang disediakan.
Jawab mana-mana **dua** soalan dalam Bahagian C. Semua jalan kerja yang sesuai hendaklah ditunjukkan. Bagi jawapan berangka, unit hendaklah dinyatakan di mana-mana yang sesuai. Mulakan setiap jawapan pada helaian kertas jawapan yang baharu dan susun jawapan anda mengikut tertib
berangka.

Jawapan boleh ditulis dalam bahasa Inggeris atau Bahasa Malaysia.

Section A *[15 marks]*

1 *Two atomic particles P and Q have the following compositions:*

P : 12 protons, 12 neutrons, 10 electrons
Q : 12 protons, 12 neutrons, 12 electrons

Which of the following is true?

A *P and Q are isomers.*
B *P is an ion and Q is an atom.*
C *P and Q are both ions.*
D *P and Q are isotopes.*

2 *The wavelength of the first line in the Lyman series is*
[$R_H = 1.097 \times 10^7\ m^{-1}$]

A $1.22 \times 10^{-7}\ m$
B $3.42 \times 10^{-8}\ m$
C $8.16 \times 10^{-6}\ m$
D $5.18 \times 10^{-7}\ m$

3 *Which of the following particles has only paired electrons?*

A O^-
B F
C Fe^{2+}
D Zn

4 *Which of the following statements explains why aluminium conducts electricity when a potential difference is applied to it?*

A *Aluminium ions move to the positive terminal*
B *The crystal lattice breaks down.*
C *The atoms of aluminium become ions.*
D *The bonding electrons in the crystal lattice move.*

5 *Which of the following substances has the strongest intermolecular force in its liquid state ?*

A NH_3
B CH_4
C C_2H_5OH
D CO_2

6 *Which of the following pairs of substances has the same shape?*

A CO_2 *and* SiO_2

B BeH_2 and H_2S
C BCl_3 and PCl_3
D CH_4 and $AlCl_4^-$

7 Calculate the volume (in cm^3) occupied by 0.30g of a gas (M_r= 30) at 308 kPa and 300K ? [R = 8.31 Pa m^3 mol^{-1} K^{-1}]

A 48
B 69
C 81
D 120

8 A closed container contains 30% nitrogen and 70% oxygen by volume at room conditions. 250 cm^3 carbon dioxide (which is measured at room conditions) are introduced into the container. Which of the following statements is correct?

A The partial pressure of nitrogen decrease.
B Part of the oxygen reacts with the carbon dioxide.
C The partial pressure of nitrogen and oxygen decreases while the partial pressure of carbon dioxide increase.
D The partial pressure of oxygen remains the same.

9 The reaction between XO_2 and O_3 is given below.

$$2XO_2 + O_3 \rightarrow X_2O_5 + O_2$$

Which of the following is most probably the mechanism for the reaction if the reaction is first order with respect to both XO_2 and O_3 ?

A
$$2XO_2 + O_3 \xrightarrow{slow} X_2O_6 + O$$
$$X_2O_6 + O \xrightarrow{fast} X_2O_5 + O_2$$

B
$$XO_2 + O_3 \xrightarrow{slo} X_3 + O_2$$
$$XO_3 + XO_3 \xrightarrow{fast} X_2O_5 + {}_2O_2$$

C
$$XO_2 + O_3 \xrightarrow{slow} XO_3 + O_2$$
$$XO_3 + XO_2 \xrightarrow{fast} X_2O_5$$

D
$$XO_2 + O_3 \xrightarrow{slow} XO_3 + O_2$$
$$XO_5 + XO_2 \xrightarrow{fast} X_2O_5 + O_2$$

10 Which of the following is correct regarding the half-life of a first order reaction?

A The half-life is dependent on the pressure
B The half-life dependent on the concentration of the reactant
C The half-life decreases with decreasing temperature
D The amount of substance left after a time interval of four half-life is 6.25% of the original value

11 Which of the following statements about catalyst in incorrect?

A A catalyst will not alter the composition of an equilibrium mixture.
B A catalyst may form temporary chemical bonds with the reactants.
C A catalyst will change the rate constant of a reaction.
D A catalyst will change the position of equilibrium of a reversible reaction.

12 The reaction for the preparation of sulphur trioxide is shown below.

$$2SO_2(g) + O_2(g) \leftrightarrow 2SO_3(g) \qquad \Delta H = -197\ kJ$$

Sulphur dioxide and oxygen are passed over a heated vanadium (V) oxide catalyst. Which of the following may increase the formation of sulphur trioxide?

A Reduction in pressure
B Decrease in temperature
C Addition of a promoter to the catalyst
D Increases in the volume of the container

13 What is the pH of the solution obtained when 300 cm^3 of 0.2 $moldm^{-3}$ sulphuric acid is added to 200 cm^3 of 0.4 $moldm^{-3}$ aqueous potassium hydroxide?

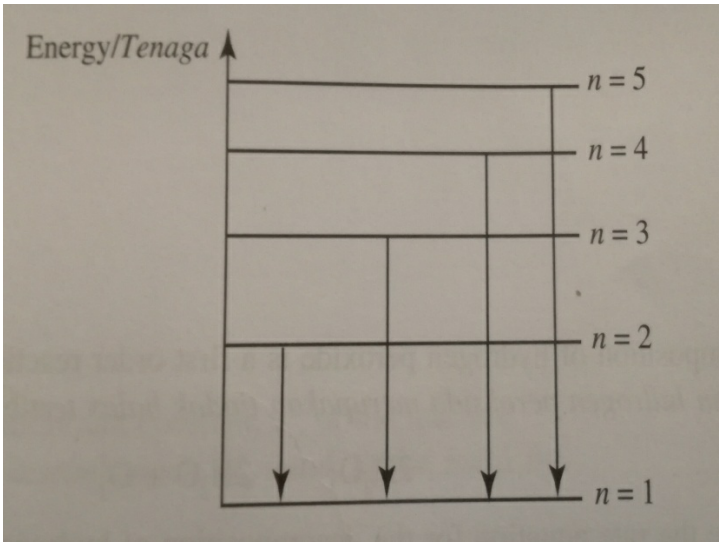
A 1.10
B 6.88
C 9.51
D 12.60

14 Silver sulphate, Ag_2SO_4 and strontium sulphate, $SrSO_4$ are added to water. Which of the following statements are true regarding the saturated solution obtained?
[Solubility product, Ksp : $Ag_2SO_4 = 1.5 \times 10^{-5}\ mol^3\ dm^{-9}$ and $SrSO_4 = 2.8 \times 10^{-7}\ mol^2 dm^{-6}$ at 298 K]

A $SrSO_4$ is more soluble than Ag_2SO_4
B The sulphate ions in the saturated solution come from $SrSO_4$
C The concentration of the sulphate ion from Ag_2SO_4 can be ignored.
D Addition of a little silver nitrate will decrease the solubility of Ag_2SO_4.

Section B (15 marks)
Answer all questions

16 (a) The diagram below shows four transitions of electron in the hydrogen atom.



(i) Sketch the line spectrum formed as a result of these four transitions. In your diagram,
draw an arrow to show the direction of decreasing wavelength. [2 marks]

(ii) Based on the diagram above, explain why the emission spectrum of hydrogen atom
consists of discrete lines instead of a continuous spectrum. [2 marks]

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(b) (i) Explain the term coordinate bond. [1 mark]

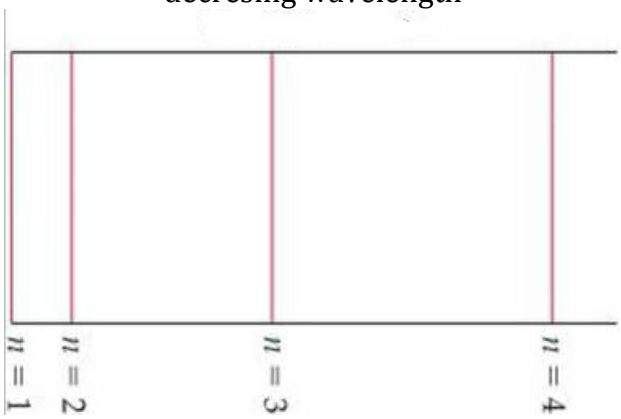
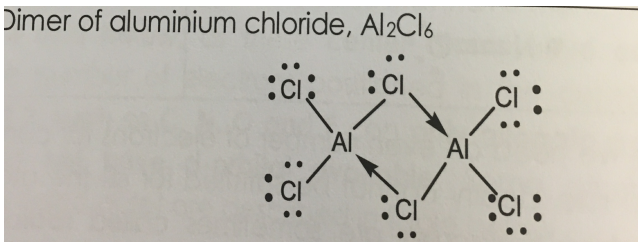
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CHEMISTRY MARKING SCHEME 2019

Section A (15 marks)

QUESTION	ANSWER	EXPLAINATION
1	B	P : nu of proton ≠ nu of electrons, hence P is ion Q: nu of proton = nu of electrons, so Q is atom
2	A	$1/\ = R_H (1/n_1^2 - 1/n_2^2)$ $= 1.097 \times 10^7 (1/1^2 - 1/2^2)$ $= 1.22 \times 10^{-7} m$
3	D	${}_8O^-$: $1s^2\ 2s^2\ 2p^5$
4	D	
5	C	
6	D	
7	C	$PV = nRT$ $V = (0.30)(8.31)(300)/\ (30)(308 \times 10^3)$ $= 81\ cm^3$
8	D	Due to the Dalton' s law : The total pressure of a mixture of gases that do not react chemically with each other is the sum of the partial pressures that each gas would exert if it were present alone.
9	C	
10	D	
11	D	
12	B	
13	A	Nu. of moles of $H^+ = (300 \times 10^{-3}) \times 0.2 \times 2 = 0.12$ mol Nu. of moles of $OH^- = (200 \times 10^{-3}) \times 0.4 = 0.08$ mol Nu. of moles of H^+ left $= 0.12 - 0.08 = 0.04$ mol $[H^+] = 0.04 \times 1000/500 = 0.08\ moldm^{-3}$ $pH = 1.10$
14	D	
15	A	The vapour pressure of mixture y is equal to the atmospheric pressure (1 atm) at temperature T. Boiling point of y is T

16.

Question Number	Suggested answer	Mark
	Section B[15 marks]	
16 (a) (i)	← decresing wavelength 	[2]
(ii)	The electron can only be at certain allowable energy levels.	[2]
(b)(i)	A coordinate bond is a covalent bond formed when both the electrons of the bond pair is donated by one of the atoms	[1]
(ii)	Dimer of aluminium chloride, Al_2Cl_6 	[1] [1]
	Total	**7 marks**

17.

NO	ANSWER	MARKS
(a)	The pressure exerted by a gas if the gas itself occupies the same volume as the mixture under the same temperature	**[1]**
(b)	$K_p = \dfrac{P^2(SO_3)}{P^2(SO_2)P(O_2)}$	**[1]**
(C)	$K_p = \dfrac{(0.364)^2}{(0.456)^2(0.180)}$ $= 3.54\ atm^{-1}$	**[1]** **[1]**
(d)(i)	Equilibrium will shift to the left because the reverse reaction is accompanied by an increase in the number of moles of gas(from 2 moles to 3 moles)	**[1]** **[1]**
(ii)	Equilibrium shift to the left because the partial pressure of the gas decrease.Hence the system will react to incrase the pressure by increasing the number moles of gas.	**[1]** **[1]**
	Total	**8 marks**

Suka sampel ini?

Kertas Percubaan STPM

Sem 1 · Kimia

- 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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