

CONFIDENTIAL



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019**

COURSE NAME : CHEMISTRY
COURSE CODE : DAS 12102
PROGRAMME CODE : DAE
EXAMINATION DATE : JUNE / JULY 2019
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

CONFIDENTIAL

- Q1** (a) Write an electron configuration of an element with atomic number of 16. (2 marks)
- (b) Calculate the mass in gram (g) of the following atom.:
- (i) 0.72 mol atom of Li.
 - (ii) 2.4 mol atom of N.
 - (iii) 3.32 mol atom of K.
- (6 marks)
- (c) Copper oxide can be reduced to copper by a suitable reducing agent. When a mass of 7.2 g of copper oxide is used, 6.4 g of copper are produced.
- (i) Calculate the number of moles of copper in 6.4 g of copper. (2 marks)
 - (ii) Calculate the mass and number of moles of oxygen atom in 7.2 g of copper oxide. (4 marks)
- (d) Determine the empirical formula of the compounds with the following compositions:
- (i) 40.1% of C, 6.6% of H and 53.3% of O. (3 marks)
 - (ii) 18.4% of C, 21.5% of N and 60.1% of K. (3 marks)

- Q2** (a) Write the electron configuration of Titanium (atomic number is 22) according to Aufbau principle and Hund's rule. (6 marks)
- (b) The table below is a small part of the main Periodic Table. The following questions are related to the Periodic Table.

	1	2	13	14	15	16	17	18
								He
	Li	Be	B	C	N	O	F	Ne
	Na	Mg	Al	Si	P	S	Cl	Ar

- (i) Which group contains of
- (i) Halogen,
 - (ii) alkali element.
- (2 marks)
- (ii) Choose
- (i) a metal from Period 3.
 - (ii) a non-metal from Period 3.
- (2 marks)
- (c) Chlorine and fluorine are two elements in Group 17 of the Periodic Table. Explain briefly why these elements have similar chemical properties.
- (4 marks)
- (d) An element is in Group 1 of the Periodic Table. Another element is in Group 17. Suggest **two (2)** different properties between these two elements. State the reason.
- (6 marks)
- Q3** (a) Define the following terms:
- (i) Ionic bond.
- (2 marks)
- (ii) Covalent bond.
- (2 marks)
- (b) (i) Explain the octet rule.
- (2 marks)
- (ii) Identify the number of electrons needed for ^{15}P atom to achieve an octet.
- (4 marks)
- (c) Draw the Lewis structure formula of tetrachloromethane molecule, CCl_4 . Atomic number of C = 6, Cl = 17.
- (10 marks)

- Q4**
- (a) Describe the meaning of Standard Temperature and Pressure (STP). (4 marks)
- (b) Discuss on Boyle's Law and Charles's Law. (6 marks)
- (c) A confined gas at constant temperature, T has a volume of 21.90 L at 761.6 torr. Determine the volume if the pressure is increased to 5.25 atm. (5 marks)
- (d) Calculate the temperature in °C of 9.66 mg of helium (He) gas if it exerts a pressure of 0.450 atm in a 235.0 mL vessel. (5 marks)
- Q5**
- (a) Discuss the differences between specific heat and heat capacity. (4 marks)
- (b) You are supplied with the following apparatus and chemicals.

Voltmeter, connecting wires, copper sulphate solution, zinc sulphate solution, copper electrode, zinc electrode, salt bridge
--

Describe how you will construct a Daniell cell by using the above apparatus. Your description should include the following:

- (i) A labelled diagram. (3 marks)
- (ii) Observation seen at the positive and negative terminal. (6 marks)
- (iii) Half equation for the reactions at both terminals (2 marks)
- (iv) Explanation for the cell equations. (5 marks)

– END OF QUESTION –

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2018/2019
COURSE NAME : CHEMISTRY

PROGRAMME CODE : DAE
COURSE CODE : DAS 12102

TABLE OF DATA

<u>Atomic Mass</u>		
Atom	Symbol	Relative atomic mass (g/mol)
Lithium	Li	7
Nitrogen	N	14
Potassium	K	39
Copper	Cu	64
Oxygen	O	16
<u>Constant</u>		
Gas constant	R	0.0821 L.atm/mol.K