Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER I
SESSION 2020/2021

COURSE NAME	:	GENERAL CHEMISTRY
COURSE CODE	:	BWD 11403
PROGRAMME CODE	:	BWD
EXAMINATION DATE	:	JANUARY / FEBRUARY 2021
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS **OPEN BOOK EXAMINATION**

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THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 In a laboratory experimental, you are required to measure the volume of 250 ml of distilled water. However, the volumetric flask given to you has two etched mark (**Figure Q1**) due to production error. Explain the suitable method could be used to determine which etch mark is accurate/correct.

(10 marks)

Q2 Fikri has drawn an electronic configuration of element X which have nine electrons as in **Figure Q2**.

(a) Identify if the electron configuration drawn by Fikri is correct.

(1 mark)

(b) Explain your answer in **Q2**(a).

(9 marks)

Q3 The arrangement of element in periodic table upon the similarities in their properties is called classification of elements.

(a) Name **ONE (1)** element classified as alkaline earth metal.

(1 mark)

(c) Name **ONE (1)** element with both metals and non-metals attributes.

(1 mark)

(d) Discuss the trend of atomic radius of elements across the third period.

(8 marks)

Q4 (a) Explain how would you determine the mass of 10.0 million sulfur dioxide, SO_2 molecules in grams.

(5 marks)

(b) Phosphorus burns with excess oxygen to form tetraphosphorus, P_4. Describe the steps to determine the mass of phosphorus which shall reacts with 1.50 moles of oxygen, O_2 in accordance to the aforementioned reaction.

(5 marks)

Q5 Fatin is required to prepare silver bromide, AgBr compound. This compound is insoluble in water, therefore Fatin plan to prepare it by using precipitation reaction, which involves of mixing two solution of water-soluble compounds which are, 0.115 M silver nitrate, $AgNO_3$ and 0.125 M calcium bromide, $CaBr_2$.

(a) Express this reaction in a balanced chemical equation.

(2 marks)

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(b) If Fatin found that there are 0.50 M $AgNO_3$ in reagent bottle, explain how can Fatin prepare 50 mL of 0.115 M $AgNO_3$ before the reaction can be conducted.

(3 marks)

(c) Describe how would Fatin determine the volume of calcium bromide that should be used to conduct the reaction.

(5 marks)

Q6 (a) Demonstrate a diagram to depict the interaction occurs when a molecule of PH_3 and HCl are attracted together.

(2 marks)

(b) Draw the possible resonance structures for $SnCl_3^-$. Determine the formal charges on each atom in the resonance structures.

(8 marks)

Q7 Oxygen and carbon monoxide are colourless, odourless and tasteless gases. As opposed to oxygen gas, which is essential to a living organism, carbon monoxide can causes death due to poisonous attributes. In blood circulation, the carbon monoxide molecules can easily manipulate red blood cells rather than oxygen molecules. By using the relationship of Lewis structure, resonance structure and chemical bond concept, discuss the situation.

(10 marks)

Q8 Potassium bromide (KBr) is illegally used in food and pharmaceutical industries as an additive agent. It is because it has potential to influence several pathways in organism living memory formation. The formation of KBr is produced from the reaction between hydrogen bromide (HBr) with potassium hydroxide (KOH) substances, and the water is produced as a by-product.

(a) Express the correct neutralization reaction of KOH formation included their phases.

(2 marks)

(b) Define Arrhenius acid-base and Brønsted-Lowry acid-base theories.

(4 marks)

(c) Determine the substances involved either acid or base according to:
(i) Arrhenius acid-base theory.
(ii) Brønsted-Lowry acid-base theory.

(4 marks)

Q9 (a) Calculate the concentration of hydroxonium ion (H_3O^+), if the pH of a lemon sample is 2.29.

(4 marks)

(b) The concentration of H^+ ions in a liquid detergent is 0.0065 M. Calculate the pOH.

(6 marks)

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Q10 When 0.100 mol of ammonia is being diluted with water to make 1000 mL of solution, the concentration of hydroxide ion is equal to 1.35×10^{-3} M. Determine the value of K_b of ammonia.

(10 marks)

– **END OF QUESTIONS** –

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Figure Q1

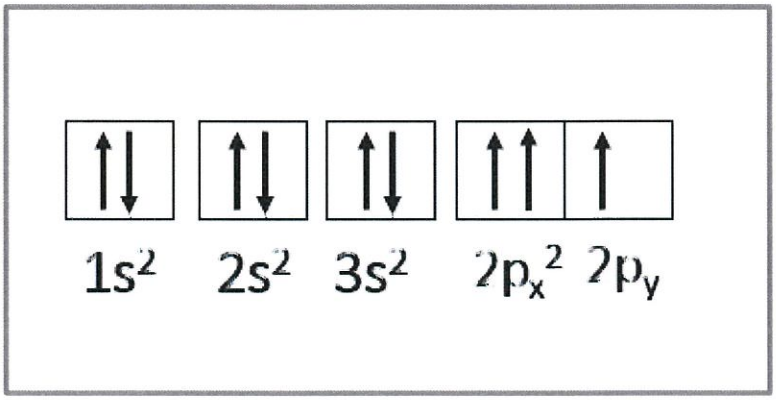

Figure Q2

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