

UNIVERSITY OF JAFFNA
BACHELOR OF PHARMACY
FIRST YEAR SECOND SEMESTER EXAMINATION - FEBRUARY 2014
PHACH 1206 PHARMACEUTICAL CHEMISTRY

Date: 07.03.2014

Time: 3 Hours

ANSWER ALL SIX QUESTIONS

Answer "Part A" and "Part B" in separate answer books.

Part A

- 1 1.1 Explain followings:
 - 1.1.1 Law of mass conservation (10 Marks)
 - 1.1.2 Law of definite compositions (10 Marks)
 - 1.1.3 Law of multiple proportions (10 Marks)
 - 1.2 Postulate Dalton's atomic theory. (40 Marks)
 - 1.3 How the Dalton's theory explains mass laws (30 Marks)
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- 2 2.1 Use a diagram to illustrate the experiment that lead to the discovery of electron. (40 Marks)
 - 2.2 Describe Rutherford's experiment. (40 Marks)
 - 2.3 Calculate the wavelength of the yellow sodium emission, which has a frequency of $5.09 \times 10^{14}/s$?
Note: The electromagnetic radiation moves at the speed of 3×10^8 m/s (20 Marks)
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- 3 3.1 Describe the consequences of impurities in pharmaceutical products. (20 Marks)
 - 3.2 Describe how impurities can be introduced to pharmaceutical products during manufacturing. (50 Marks)
 - Briefly describe the limit test for Cl^- and SO_4^{2-} . (30 Marks)

Part B

- 4.1 Give the IUPAC name of following compounds and ions
 - 4.3.1 $CoCl(NO_2)(NH_3)_4$ (05 Marks)
 - 4.3.2 $Pt(NH_3)BrCl(CH_3NH_2)$ (05 Marks)
 - 4.3.3 $[Cu(NH_3)_2(en)]Br_2$ (05 Marks)
 - 4.3.4 $K_2[Cu(CN)_4]$ (05 Marks)
- 4.2 Describe the following with example.
 - 4.2.1 Monodentate ligand (20 Marks)
 - 4.2.4 Hexadentate ligand (20 Marks)
- 4.3 Diagrammatically illustrate the isomerism of
 - 4.4.1 $[Co(NH_3)_5(NO_2)]Cl_2$ (20 Marks)
 - 4.4.2 $[Cr(OH_2)_6]Cl_3$ (20 Marks)

- 5 5.1 5.1.1 What is molecular orbital theory? (15 Marks)
- 5.2 For N_2 , O_2^+ , O_2^- molecules
- 5.2.1 Write down the molecular orbital electronic configuration (15 Marks)
- 5.2.2 Indicate the highest occupied molecular (HOMO) orbital conformation. (15 Marks)
- 5.2.3 Calculate the bond order of the above molecules. (15 Marks)
- 5.3 Sketch the molecular energy level of
- 5.3.1. CO. (20 Marks)
- 5.3.2. NO (20 Marks)
- 6 6.1 Briefly describe
- 6.1.1 valence bond (VB) theory. (10 Marks)
- 6.1.2 valence shell electron pair repulsion (VSEPR) theory. (10 Marks)
- 6.2 Describe the molecular geometry of NH_3 by using VB and VESPR theory. (40 Marks)
- 6.3 Use the VESPER theory to illustrate the following molecules /ions; H_2O , CO_3^{2-} (40 Marks)