UNIVERSITY OF JAFFNA
BACHELOR OF PHARMACY
FOURTH YEAR FIRST SEMESTER EXAMINATION
PHAPA 4114 PHARMACEUTICAL ANALYSIS - PAPER II

Date: 18.09.2018 **Time: 2 Hours**

Answer All Six Questions.

1. 1.1 Write the principle of the Gas Chromatography (GC). (20 Marks)

   1.2 List five (05) applications of the GC. (20 Marks)

   1.3 Briefly describe the following components of the GC.

   1.3.1 Flame ionisation detector (20 Marks)

   1.3.2 Electron capture detector (20 Marks)

   1.3.3 Split and splitless injection (20 Marks)

2. 2.1 How the structural information is obtained from the ^{1}H NMR. (20 Marks)

   2.2 Explain the effect of π electrons on the values of the chemical shifts for following molecules.

   2.2.1 C_6H_6 (10 Marks)

   2.2.2 $CH \equiv CH$ (10 Marks)

   2.3 Draw and describe the following NMR spectrums for the aspirin molecule.

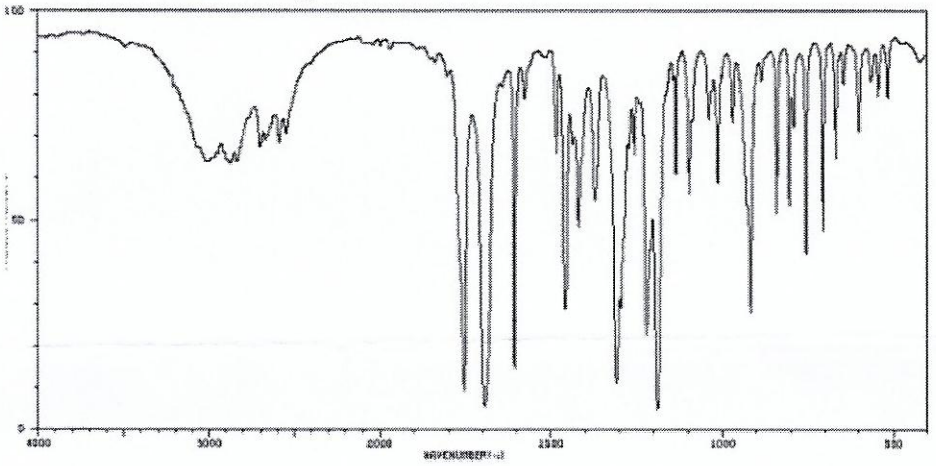
   2.3.1 ^{1}H NMR (40 Marks)

   2.3.2 ^{13}C NMR (20 Marks)

3. 3.1 Give the principle of the Infrared (IR) spectroscopy. (20 Marks)

   3.2 Explain why N-H bond absorb higher frequency of IR radiation. (20 Marks)

   3.3 The IR of the $C_9H_8O_4$ is given below.



   Identify and describe four (04) peaks that are consistent with the molecular formula. (30 Marks)

   3.4 Predict the position of IR peaks of following compounds.

   3.4.1 CH_3CONH_2 (15 Marks)

   3.4.2 $CH_3CH_2CH{=}CHCOOH$ (15 Marks)

4. 4.1 Give the principle of Ultraviolet (UV) spectroscopy. (20 Marks)

4.2 List five (05) factors that affect the absorbance of a substance in the UV spectroscopy. (20 Marks)

4.2 Describe the instrumentation of the UV with the help of a schematic diagram. (60 Marks)

5. 5.1 Give the principle of the mass spectrometry (MS). (20 Marks)

5.2 Describe one ionisation technique each for volatile and non-volatile samples that are used in MS. (30 Marks)

5.3 List four (04) advantages of Matrix Laser Desorption Ionisation Mass Spectrometry (MALDI). (20 Marks)

5.4 Briefly describe the Time of Flight Mass Detector (TOF – MS) used in MALDI. (30 Marks)

6. 6.1 Define the terms "Quality Assurance" and "Quality Control". (20 Marks)

6.2 List five (05) factors that determine the quality of a drug. (20 Marks)

6.3 Briefly describe the benefits of quality control of pharmaceuticals. (30 Marks)

6.4 Describe the thermal shock and internal bursting pressure tests for containers. (30 Marks)

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