



International Islamic University Chittagong
Department of Pharmacy

B. Pharm (Hon's) Program

Final Examination

Spring Semester 2019

Course Code: Pharm-4709

Course Title: **Pharmaceutical Analysis-III**

Time: 2 hours 30 minutes

Full Marks: 50

(Answer of separate groups should be given in separate scripts. Figures on right margin indicate marks)

Group A *(Answer any two questions from the followings)* **Marks: 20**

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|----|--|-----|
| 1. | a) What is X-ray? How it is generated? | 3 |
| | b) Derive Bragg's equation. | 4 |
| | c) Briefly discuss the rotating crystal method for x-ray crystallography. | 3 |
| 2. | a) Why it is necessary to use a modulator in atomic absorption spectroscopy (AAS)? | 3 |
| | b) Explain why some anions causes interference in AAS. | 2 |
| | c) Briefly describe the principle of AAS. | 3 |
| | d) Describe the radiation sources used for AAS. | 2 |
| 3. | a) A specific metal atom can be determined from a mixture of different metals using AAS. How it is possible? | 3 |
| | b) What are the applications of x-ray crystallography in pharmaceutical analysis? | 2.5 |
| | c) How does the atomizer works in AAS? | 2.5 |
| | d) Write down the equation for quantitative determination by AAS? | 2 |

Group B *(Answer any three questions from the followings)* **Marks: 30**

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| 4. | a) Derive the equation to find Larmor frequency. | 4 |
| | b) Briefly outline the basic principle of Nuclear Magnetic Resonance (NMR) spectroscopy. | 4 |
| | c) Introduce Tetramethylsilane (TMS) and why it is used in NMR spectroscopy? | 2 |
| 5. | a) Explain the spin-spin splitting rule with suitable example. | 4 |
| | b) What is coupling constant? Why it is called a constant? | 1+1 |
| | c) How many peaks would appear for 1-chloro propane in H^1 NMR spectroscopy? What do you mean by deshielding of proton resonances? | 2+2 |
| 6. | a) Describe the phenomenon of magnetic anisotropy with examples. | 5 |
| | b) What are chemically equivalent protons? | 1 |
| | c) Discuss the (n+1) rule using 1,1,2 trichloroethane as example. | 4 |
| 7. | a) Define microbiological assay. What is International Unit (IU)? | 3 |
| | b) What are the validation criteria of microbiological assay? | 2.5 |
| | c) Describe the turbidimetric method for microbiological assay of antibiotics. | 4.5 |