



**CHM 301: INSTRUMENTATION AND ANALYTICAL CHEMISTRY I**

**TIME ALLOWED: 1 Hour**

**DATE: 25/01/2025**

**Instructions:** Attempt **ALL** the questions. Each question carries **10 marks**

- 1 (a) Explain briefly how information about an analyte can be acquired in an instrumental analysis based on electron excitation. *Amount of radiation as emission absorption occur*
- (b) Name the most commonly used source of monochromatic light in Atomic absorption Spectrophotometry. *hollow cathode lamp* (ii) With the aid of a properly labelled diagram, explain how the source of the monochromatic light functions.
2. The complete removal of 0.2 g of iodine from 50 cm<sup>3</sup> of an aqueous solution of iodine and sodium chloride is carried out using CCl<sub>4</sub>/H<sub>2</sub>O; the value of D was given as 85.
- (a) Calculate the efficiency using: (i) 15 cm<sup>3</sup> of CCl<sub>4</sub> once; (ii) batch extraction three times.
- (b) Which method out of the two in (a) above will be more efficient?
3. (a) In not more than 10 lines, state the differences among Absorption, Emission, and Scattering in Spectroscopy.
- (b) List and explain any five limitations of Beer-Lambert Law.

*15 cm<sup>3</sup> 0.2*