



The exam consists of one sheet

Please answer all the following questions

- 1- The organic matter is divided into two groups - Discuss. (10 marks).
- 2- Explain the classical method to extract humic materials from soil or sediments with drawing. (10 marks).
- 3- Discuss and explain the chemical methods for determining the following functional groups:- (10 marks).
 - a - Total acidity
 - b- Carboxyl groups
 - c - Total hydroxyl groups
 - d- Phenolic OH groups
- 4- Identify the E_4 / E_6 ratio of dilute aqueous HA and what is the magnitude of this ratio. (10 marks).
- 5- Indicate what are the functional groups in humic and fulvic acids as shown in infrared (IR) spectra with drawing. (10 marks).
- 6- Compare between the metal complex and metal chelate (10 marks).

With our best wishes

Examiners committee

Prof. Dr. Ahmed A. Taha

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