Roll No.										

Paper Code: MTEV-023/ENV14G

M.TECH

(SEM I) ODD SEMESTER EXAMINATION 2016-2017

INSTRUMENTAL METHOD OF ANALYSIS

[Time: 3 Hours] **[Max Marks: 70]**

Note: Attempt all five questions. All questions carry equal marks.

Q.1 Attempt any **TWO** parts of the following:- **[7x2=14]**

a) What is the principal behind polarographic analysis? List at least four different substances in water that can be determined by polarographic analysis?
b) What is atomic emission Spectroscopy? What are its advantages and disadvantages? Also give some of its applications.
c) What are the different regions of infrared radiation? Explain various types of stretching and bending vibrations with suitable examples.

Q.2 Attempt any **TWO** parts of the following:- **[7x2=14]**

a) Discuss the principal of gas chromatography. What are the main differences between gas chromatography and High pressure liquid chromatography?
b) How do you select a stationary phase for a given sample and which detector offers the greatest sensitivity for the most samples in gas chromatography and why?
c) Explain the working of gas-liquid chromatography, and how it differs from gas-solid chromatography?

Q. 3 Attempt any **TWO** parts of the following: - **[7x2=14]**

a) What is the principle of EPR? Discuss some important applications of EPR. What are the limitations of EPR?
b) What are the advantages of using Electrode less discharge lamps over Hollow cathode lamps as light sources in atomic absorption spectroscopy?
c) Explain flame photometry and discuss its application in instrumental method of analysis.

.Q.4 Attempt any **TWO** parts of the following: - **[7x2=14]**

a) An aliquot of a solution containing a light absorbing substance at a concentration of 5 gm/dm^3 was placed in 2 cm light path cuvette. The cuvette was placed in spectrophotometer and a beam of light of wavelength was passed through the cuvette containing the solution. A transmission value of 80% was recorded. What is (i) the absorbance of the solution and (ii) the molar extinction coefficient if the molecular mass of the substance is known to be 410?
b) What is the basic difference between optical method and emission method of analysis? State the Beer Lambert law with its limitations and deviations.
c) What are two different methods for measuring turbidity in water? Explain any two of them in detail.

Q.5 Write short notes on any **FOUR**:- **[3.5x4=14]**

a) Emission spectroscopy
b) TOC analyser
c) X-ray fluorescence
d) Ion chromatography
e) Potentiometric analysis
f) Electromagnetic spectrum