M.Sc. Examination 2018
Semester-I
Environmental Science
Course : MEC-14
(Techniques in Environmental Science)

Time : 3 Hours **Full Marks : 40**

Questions are of value as indicated in the margin

Answer question No. **1** and **any four** from the rest.

1. Write short notes on **any four** of the following. 2×4=8
   a) Standard calibration curve
   b) Principles of electrophoresis
   c) Applications of chromatography
   d) Need for sample preparation
   e) Titrant and Titrand
   f) GC-MS

2. a) What do you mean by monitoring?
   b) What are the objectives of water quality monitoring?
   c) Discuss various sampling techniques you have studied for collecting air samples. 1+4+3=8

3. a) Write the principles of colorimetry.
   b) Illustrate, how colorimetry be used for analyzing gaseous air pollutants?
   c) How can you sample and analyze particulate air pollutants? 1+4+3=8

4. a) Define Chromatography.
   b) What are mobile phase and stationary phase in chromatographic techniques?
   c) Discuss the process of thin layer chromatography. 1+2+5=8

5. a) Discuss the basic principle and process of X-ray diffraction crystallography.
   b) An enzyme examined by means of gel filtration in aqueous buffer at pH 7.0 had an apparent molecular weight of 160,000 Dalton (Da). When examined by SDS-PAGE, 2 bands of apparent molecular weight 20,000 Da and 60,000 Da were formed. Explain these findings. 5+3=8

6. Discuss the following :
   a) The principle for acid digestion for heavy metals.
   b) Which acid is best suited for extracting heavy metals?
   c) Estimation of chromium. 2+3+3=8

7. a) Illustrate different components of AAS.
   b) Differentiate between Flame-AAS and GF-AAS. 5+3=8

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