**N-56092**  
Seat No.________

**M. Sc. (Part - II) Examination**  
April / May – 2003

**Environmental Science : Paper - VIII**  
(*Environmental Modern Analytical Techniques & Instrumentations*)

Time : 3 Hours]  
[Total Marks : 75

**Instruction** : All questions carry equal marks.

1  
(a) Give the classification of errors.  
(b) Calculate the mean of the following sets of the values :  
10.5, 10.4, 10.6, 10.7, 11.8 and 10.8.  
(c) Discuss the standard method of the collection of air samples.

OR

1  
(a) How are water samples collected ?  
(b) Explain least square method.  
(c) Calculate the regression equation, \( y = a + bx \) for the following data :

<table>
<thead>
<tr>
<th>X</th>
<th>0.2</th>
<th>0.4</th>
<th>0.6</th>
<th>0.8</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2  
(a) Explain solvent expaction technique.  
(b) A 0.001 g of the mercury was remained when it was extracted with 20 ml chloroform solution of methylene blue from 25 ml of aqueous solution. Calculate the distribution co-efficient.

N-56092]  
1  
[Contd..
(c) Write a note on gas chromatography.

OR

2 (a) Discuss plate theory?
(b) What are the advantages of HPLC.
(c) Discuss TCD (Thermal Conductivity detector).

3 (a) Explain Beer's Law and calibration curve.
(b) Give the principle of IR and its importance.
(c) Discuss the Fluorimetry.

OR

3 (a) Explain the advantages of graphite furnace atomic absorption spectrometry.
(b) How is arsenic estimated by Hydride Generator technique.
(c) Explain plasma Emission.

4 (a) Explain many dropping electrode.
(b) What are ion selective electrodes?
(c) Show that the glass electrode is a hydrogen ion selectrode.

OR

4 (a) Discuss isotopic dilution technique.
(b) What one its limitation.
(c) A unknown solution of mercury was mixed with 0.6 g of labelled mercury (900 counts per second). The purest form of the merany was isolated which gave 450 counts per second. Calculate the amount of mercury in the sample.
5 Write note on the following: (any two)
(a) Flame photometry
(b) Nephelometry
(c) SO₂ Monitoring
(d) NOX Monitoring.