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SI- 69

Total No. of Pages : 3

Seat No.	
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**M.Sc. (Part - II) (Semester - III) (CBCS)**  
**Examination, December - 2016**  
**ANALYTICAL CHEMISTRY**  
**Environmental Chemical Analysis and Control**  
**(Elective) (Paper-XIIA,)**  
**Sub Code :61051**

Day and Date : Thursday, 15 - 12 - 2016  
Time : 10.30 a.m to 01.30 p.m.

Total Marks : 80

- Instructions :
- 1) Attempt in all five questions.
  - 2) Question no. One is Compulsory.
  - 3) All questions carry equal marks.
  - 4) Answer to the two section should written in the same answer book and attempt at least two questions from each section.
  - 5) figure to the right indicate marks.
  - 6) Neat labeled diagrams should be drawn wherever necessary.
  - 7) Use of log table and calculator is allowed.

Q1) Answer the following:

[16]

- a) Which organometallic pollutant is responsible for Minamata disease?
- b) What are the end products of an aerobic degradation of organic wastes in water body?
- c) A variety of water containing soluble salts of  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  is called----- of water.
- d) West-Gaeke method is particularly useful for the analysis of ----- gaseous pollutants.
- e) What is poison?
- f) Draw the structure of Cadmium (II) dithiozone complex.
- g) Define the term waste.

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- h) What are the physiological manifestation caused due to Cd and Hg poisoning?
- i) Which instrumental methods used for the monitoring of trace metal pollutants from the air?
- j) How does odour pollution of water is caused?
- k) Sampling and measurement of air pollutants, generally known as-----
- l) Which method is used for the determination of dissolved oxygen (DO)?
- m) What are the major sources of phenolic pollutants in water?
- n) Samples after collection for analysis should not be kept for long time why?
- o) What are the sources of heavy metals in the environment?
- p) Write the full form of VOCs and POCs.

### SECTION- I

- Q2)** a) What are the effects of lead (Pb), Cadmium (Cd) and Mercury (Hg) poisoning on human health? Explain spectrophotometric analysis of cadmium. [8]
- b) What are the effects of heavy toxic metals on human body? [4]
- c) Explain monitoring, sampling and analysis of atmospheric carbon monoxide(CO) and carbon dioxide(CO<sub>2</sub>) pollutant. [4]
- Q3)** a) What are the sources of gaseous pollutants in the atmosphere? Explain monitoring, sampling and analysis of atmospheric sulphur dioxide SO<sub>2</sub> [8]
- b) Explain spectrophotometric analysis of hydrogen sulfide (H<sub>2</sub>S) air pollutant. [4]
- c) Explain Winkler's method of DO analysis. [4]



- Q4) a) What are the major sources of phenolic residues in water? What is phenosolvan? Explain steam gas stripping method. [8]
- b) Explain the nature of industrial effluents given out by various chemical industries. [4]
- c) How do you detect atmospheric  $\text{NO}_x$  Pollutants? Explain analysis of  $\text{NO}_x$  using Chemiluminescence method. [4]

### SECTION- II

- Q5) a) Explain instrumentation, working and applications of Atomic Fluorescence spectrometry and NDIR spectrometer. [8]
- b) What are the sources of air pollutant in the atmosphere? Explain gas stream filtering and gravity separation methods used for removal of particulate matter. [8]
- Q6) a) Distinguish between BOD and COD. Describe determination of chemical oxygen demand (COD) of the waste water. [8]
- b) What are pesticides? Explain analysis of organochlorine pesticide residue? [8]
- Q7) Write short note on (any three): [16]
- a) Microbial treatment of phenolic residue.
  - b) Applications of AAS and ICPS.
  - c) Analysis of hexavalent chromium.
  - d) Odour and its measurement.
  - e) Heavy metal pollution and their physiological manifestations.

