

**Total number of printed pages – 6**      **B. Tech**  
**CPEV 8203**

**Fourth Semester Examination – 2008**

**ENVIRONMENTAL CHEMISTRY**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory  
and any **five** from the rest.*

*The figures in the right-hand margin  
indicate marks.*



1. Briefly answer the following questions : 2×10
- (i) Discuss the temperature profiles of the atmosphere in a diagram.
  - (ii) What is smog and how it is formed ?  
What are the bad effects of smog ?

- (iii) Which two air pollutants comes from automobile exhausts ?
- (iv) Which equipment is very commonly used for the sampling of SPM in the local atmosphere ?
- (v) Explain the term colloidal dispersion ?
- (vi) Name three compounds of orthophosphates and poly phosphates which are commonly encountered in environmental practice ?
- (vii) Which ion is responsible for developing 'crown corrosion' in concrete sewers ?
- (viii) What are the chemicals and equipments used for COD test ? How much time it takes to perform the test ?

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**Contd.**

- (ix) What do you mean by microbial metabolism of heavy metals ?
  - (x) What are the effects of arsenic on human health if it is found in high concentration in drinking water ?
2. Discuss the receptors, sinks and pathways of pollutants in the atmosphere with help of flow diagrams. 10
  3. Discuss the role of oxides of nitrogen, hydrocarbon and oxidants in photo oxidation with the help of the chemical reactions and photolytic cycles. 10
  4. (a) Arrange the pH values (mention approximate pH values) in a sequential order for the following materials : Baking soda, battery acid, distilled water, tomato juice, Sea water, lemon juice and milk. 5

- (b) Discuss the relation of conductivity with total dissolved solids. What is activity coefficient ? 5
5. (a) Write the chemical equations summarizing all the essential reactions involved in the Winkler's method used for the determination of DO. 5
  - (b) The following data were obtained in the analysis of industrial wastewater: After 5 day's incubation at 20°C residual DO in the blanks was 7.8mg/L and in a 0.1 % dilution of the waste was 2.8mg/L. Determine the BOD<sub>5</sub> of the wastewater. 5
  6. (a) Discuss the maximum contaminant levels (MCL) of following trace inorganic contaminants (elements) in water : 5

(i) Chromium

(ii) Lead

(iii) Mercury

(iv) Cadmium

(v) Copper

(b) Discuss the significance of high and low fluoride levels in water supplies. How the concentration of fluoride in water can be determined in the laboratory ? 5

7. (a) What are the common exchangeable cations in the composition of soil and what do you mean by the cation exchange capacity (CEC) of soils. 5

(b) Discuss the Nitrogen cycle and its significance in the improvement of fertility of soils. 5

8. Write short notes on the following : 2.5×4

(i) Radioactive waste

(ii) Peroxy Acetyl Nitrate (PAN)

(iii) Methyl Iso cyanate (MIC)

(iv) Bio-magnification.