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

Fourth Semester Examination – 2008

ENVIRONMENTAL CHEMISTRY

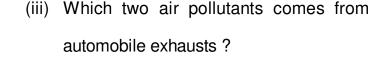
Full Marks - 70

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?



- (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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- (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 ?
- Discuss the receptors, sinks and pathways of pollutants in the atmosphere with help of flow diagrams.
- Discuss the role of oxides of nitrogen, hydrocarbon and oxidants in photo oxidation with the help of the chemical reactions and photolytic cycles.
- (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.

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- (b) Discuss the relation of conductivity with total dissolved solids. What is activity coefficient?
- (a) Write the chemical equations summarizing all the essential reactions involved in the Winkler's method used for the determination of DO.
 - (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 BOD₅ of the wastewater.
- 6. (a) Discuss the maximum contaminant levels (MCL) of following trace inorganic contaminants (elements) in water: 5

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

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- 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.

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