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# SB-3586

## M. Sc. (Part-II) Examination

**March / April – 2011**

## Environmental Chemistry : Paper-II (S.F.)

*(Water and Air Pollution and Analyses)*

Time : **3** Hours] [Total Marks : **70**

**Instructions**

**(1)**

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
**Fillup strictly the details of ☛ signs on your answer book.**

Name of the Examination :

☛ **M.Sc. (Part - 2)**

Name of the Subject :

☛ **Environmental Chemistry : Paper-2 (S.F.)**

☛ Subject Code No. : **3 5 8 6** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Answer all the questions.

(3) Figure to the right hand side indicate marks.

(4) Give the figure between is required.

1 (a) Describe primary, secondary and tertiary treatment process of sewage. **12**

(b) Give the principle of reverse osmosis method for water purification. Give the flow sheet of this method. Explain how water can be purified by R.O method.

(c) What is water softening ? How is it done ? What are its uses ?

**OR**

1 (a) What do you mean by water treatment system? What is role of activated charcol in water treatment? **12**

(b) How phosphorus is removed from water ?

(c) What is microstaining? How coagulants are used in water treatment ?

2 (a) How can you determine COD (Chemical Oxygen ? Give suitable formula used for its determination. **12**

(b) How plant nutrient plays a vital role in eutrofication? Name various factors which can control eutrofication.

(c) What is total hardness of water ? Differentiate between temporary and permanent hardness of water. How is it determined complexometrically?

**OR**

2 (a) Explain how natural and industrial sources can pollute river water. **12**

(b) Describe hydrologic cycle. Under what conditions precipitation occurs in hydrologic cycle ?

(c) What do you mean by thermal pollution of water ? How does it change the DO level ? What are its bad effects on aquatic life ?

3 (a) How nitrate and nitrite can be determined colorimetrically from polluted water ? **12**

(b) How phosphates are determined in water samples ?

(c) What is dissolved oxygen (DO) ? "Do plays a key role in water pollution activities," Justify. How DO can be determined ?

**OR**

3 (a) How water sampling is done for a good estimation of pollutants present in it ? **12**

(b) How $Cl^-$ and $CN^-$ can be determined using titrimetric analysis ?

(c) Describe the principle of Atomic Absorption Spectroscopy (AAS). How toxic metals can be determined by AAS ?

4 (a) What happens when : **12**

(i) $SO_2$ is photolysed,

(ii) $SO_2$ is exposed to light in presence of $NO_x$ and hydrocarbon.

(b) What is acid rain ? Name important acidifying substances that are deposited from atmosphere.

(c) How oxidation of $SO_2$ takes place in atmosphere ? Give the factors which affect the rate of oxidation of $SO_2$

**OR**

4 (a) Name various sources of NO in atmosphere. **12**
Why NO concentration decreases in polluted area after some time ? Give suitable reactions.

(b) Define air pollution. Describe air pollution system with the help of line diagram. What are the various types of air pollution emission ?

(c) Name origin and all possible sources of CO. How is CO toxic to human beings ?

5 (a) Give the possible structures of Criegec biradical resulted from ethane. **12**

(b) What are major reactions of aromatic hydrocarbons with hydroxy1 radical ? How are they different from reaction between alkene and hydroxy1 radical ?

(c) Write note on organosulfur compounds as atmospheric pollutants.

**OR**

5 (a) What is criegec intermediate ? What are the important reactions of criegec intermediate ? **12**

(b) What are the important aspects of free radical reactions involving hydrocarbon in atmosphere ?

(c) What ate the sources of atmospheric methane ? How termites produce methane ?

6 (a) How will you do the sampling of air ? Explain giving the diagram of air sampling train. **10**

(b) Give the method of analysis of sulfur dioxide from polluted air sample.

**OR**

6 (a) How will you analyse the commercially produced nitrogen oxide ? **10**

(b) How will you determine the concentration of CO from atmospheric air sample ?

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