

Roll No

Unique Paper Code : 32177909
Name of the Paper : DSE-Industrial Chemicals & Environment
Name of the Course : B.Sc.(H) Chemistry
Semester : VI
Duration : 3 Hours
Maximum Marks : 75

Instructions for Candidate

(Write your Roll No. on the top immediately on receipt of this question paper.)

1. There are six questions in all. All questions carry equal marks.
2. Attempt any **Four** Questions in all.

Q1. (a) Fill in the blanks (**any five**):

1. is the most important free radical species present in the troposphere.
2. process is used for the industrial production of nitric acid.
3. The heating of earth's atmosphere due to trapped radiation is known as
4. Utilizing enzymes to perform organic synthesis is termed as
5. is a method of refining substances based on differences in their solubility.
6. Acid which is present in maximum amount in acid rain is.....

(b) Explain the following with suitable examples and chemical reactions as required:

- i) Flux and slag
- ii) Coagulation and flocculation
- iii) Cracking

(c) Explain the various processes that take place in the production of iron from iron ore in the blast furnace.

(5, 7.5, 6.25)

Q2.(a) What are the major sources and sinks of CO in atmosphere. Explain a method of estimating CO in air sample.

(b) Explain modified Winkler method for the estimation of dissolved oxygen. What is the importance of dissolved oxygen in a water body and what parameters measure its depletion?

- (c) What is geothermal energy? What are the various ways in which it can be harnessed? Also discuss its advantages and limitations.

(6.25, 6.25, 6.25)

Q3.(a) How can the effluents from the following industries be treated? (any two)

- (i) Dairy Industry
- (ii) Petroleum Industry
- (iii) Fertilizer Industry

(b) Define biocatalyst. Explain two industrial applications of the biocatalysts.

(6.25, 6.25, 6.25)

Q4.(a) Explain the industrial method for the production of potassium dichromate and give its applications.

(b) Draw and explain the biogeochemical cycle of Sulphur.

(c) What are the causes of ozone layer depletion? Explain what happens in the spring season in the stratosphere over Antarctica?

(6.25, 6.25, 6.25)

Q5.(a) Discuss the hazards involved in handling the following:

- (i) Nitrogen
- (ii) Chlorine
- (iii) Hydrogen peroxide

(b) Discuss the different types of nuclear wastes and the methods of their disposal.

(c) Discuss the various methods for removal of particulate matter from a gas stream.

(6, 6.5, 6.25)

Q6.(a) Draw a well labelled diagram of different regions of atmosphere with altitude, temperature variation and the chemical species existing in each layer.

(b) What is sludge digestion? Discuss the methods of further treatment and disposal of digested sludge.

(c) What is meant by coal conversion? Discuss the various methods of coal conversion.

(6, 6.5, 6.25)