

## OBE Sample Paper

Name of Paper: Industrial Chemicals & Environment  
Name of Course: B.Sc. (H) Chemistry (DSE)  
Semester: VI  
Maximum Marks: 75

Attempt any four questions.

All questions carry equal marks.

- (a) Most people are aware that atmospheric  $\text{CO}_2$  contributes to global warming and climate change. In what respect, however, is the atmosphere's  $\text{CO}_2$  part of earth's natural capital, that is, where would be without it? What crucial natural phenomenon causes a slight, but perceptible change in atmospheric  $\text{CO}_2$  levels over the course of a year?

(b) How is hypo is manufactured? What are the main applications of hypo and what precautions should be kept in mind while using it?

(c) What basic phenomenon is responsible for nuclear energy? What keeps the process going?

6.25 X 3
- (a) In the case of Blast furnace, show how carbon reduces iron oxide at all temperatures.

(b) Define biocatalyst and explain its importance in chemical industry with suitable example.

(c) What is BOD? Give the difference between carbonaceous BOD and nitrification BOD. 5 day BOD of some wastewater was found to be 200mg/L. If the reaction rate constant  $K = 0.22/\text{day}$ , find ultimate BOD.

6.25 X 3
- (a) How are semiconductors are refined by Van Arkel de Boer's filament growth method?

(b) CO is more dangerous than  $\text{CO}_2$ . Why? Explain chemistry behind it.

(c) What is oleum? Outline the contact process for manufacturing sulphuric acid. What are the main applications of sulphuric acid?

6.25 X 3
- (a) "Thermal power plants are deemed essential for generation of electricity, an important energy resource in our economy. But they also produce wastes which are harmful for the environment." Elucidate. Suggest measures for minimizing hazards from these wastes and utilizing some of these wastes.

(b) How is sludge disposed during secondary treatment of water, explain with reactions?

(c) A factory was started near a village. Suddenly villagers started feeling the presence of irritating vapors in the village and cases of headache, chest pain, cough, dryness of throat and breathing problems increased. Villagers blamed the emissions from the chimney of the factory for such problems. Explain what could happened. Give chemical equations for the support of your explanation.

6.25 X 3
- (a) What is eutrophication and how can it be controlled? What is Liebig's Law? How can Liebig's law be explained with eutrophication as an example?

(b) Outline the Cryogenic air separation.

(c) List some medicinal uses of  $\text{KMnO}_4$ . How it is prepared?

6.25 X 3
- (a) Illustrate the different regions of atmosphere, specify the different chemical species and biota present in the different regions.

(b) Bottled water is a product with enormous annual sales. What are the advantages of using this source of drinking water? What are the environmental disadvantages of this product?

(c) In a given sample of bleaching powder, the percentage of available chlorine is 49. What volume of chlorine obtained if 10 g of the sample is treated with HCl at *N.T.P.*?

6.25 X 3