

**M.Sc. III Semester Degree Examination, April/May - 2023****INDUSTRIAL CHEMISTRY****Paper No. : DSE-1C : Quality Control, Environment, Health and Safety Measures****(New Syllabus)**

Time : 3 Hours

Maximum Marks : 70

**Note :** Answer **any five** of the following questions with Question No. 1 (Q.1) **compulsory**, each question carries **equal** marks.

1. (a) Explain the various parameters considered in the validation of analytical methods.  
(b) What is six sigma concept ? Discuss its salient features.  
(c) Enumerate the responsibilities and functions of quality assurance.  
(d) Describe the characteristics of ISO 14000 series of standards. **4+3+3+4=14**
2. (a) Illustrate the principle and working of potentiometer.  
(b) What is the function of water deioniser ? Explain the mechanism and working of water deionisers.  
(c) Briefly explain the procedure involved in the storing of different types of chemicals, glassware and solvents. **5+5+4=14**
3. (a) What is photochemical smog ? Explain the mechanism of its formation.  
(b) (i) List and classify the major sources of air pollution.  
(ii) Illustrate the procedure involved in sampling of particulate and gaseous pollutants from ambient pollution system.  
(c) Mention the side effects of CO. Discuss the procedure for its monitoring and analysis. **4+5+5=14**
4. (a) What was the reason for Bhopal gas tragedy ? Explain its causes and consequences.  
(b) (i) What are personal protective equipments ? Name the equipments used while using hazardous and radioactive materials.  
(ii) List and explain any one tool used for evaluating thermal explosion.  
(c) Classify the toxic substances. With suitable examples, discuss the effects of toxic substances on biological systems. **4+5+5=14**

5. (a) Account on the main causes and the processes responsible for the degradation of soil quality.  
(b) What is eutrophication ? Explain its causes, control and consequences.  
(c) How the irrigation water contaminates soil quality ? Explain with examples. **5+5+4=14**
6. (a) What is the principle of gravimetric analysis ? Explain the influence of solubility product on precipitation.  
(b) Write a note on calibration of glassware and its importance.  
(c) With neat schematics, discuss the principle and working of scrubbers in the analysis of particulate matter. **5+4+5=14**
7. (a) Briefly explain the salient features of the Factories Act.  
(b) What are runaway reactions ? With a suitable case study, explain their impact and side effects.  
(c) How phosphorus fertilizers improve the growth of plants ? Explain the dose-response curve for macronutrients. **4+5+5=14**
8. (a) What is sampling ? How sample is prepared for analysis in a laboratory ? Explain.  
(b) Enumerate on the effects of air pollution on vegetation and materials.  
(c) What is flow diagram ? Explain the importance of flow diagram and control systems in process plant design. **4+5+5=14**

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