

**ICS 404**

First Semester M.Sc. Degree Examination, December 2018
INDUSTRIAL CHEMISTRY
Environmental, Health and Safety Measures

Time : 3 Hours

Max. Marks : 70

Instructions : 1) Answer **any five** questions from Part – A and **any five** questions from Part – B.

2) Figures to the **right** indicate marks.

PART – A**(5×2=10)**

1. a) What is acid rain ? Mention its effects.
- b) What is the use of chlorofluoro carbons ? Why they have been banned ?
- c) A 50.0 g water sample was evaporated at 105 °C for 3 hours to give a concurrent value of 1.0 g. Calculate the total solids present in the sample.
- d) A 100.0 mL water sample consumed 10.0 mL 0.02 N standard AgNO₃ solution. Calculate the amount of chloride present in one liter of water sample.
- e) What is sampling ? Give its significance.
- f) Mention the chemical composition and application of tear gas.
- g) Name any two personal protective equipments and their applications.
- h) Write the emergency procedure to be followed in case of fire accident in the laboratory.

PART – BAnswer **any five** of the following :**(5×12=60)**

2. a) What is photochemical smog ? How it is formed and what are its effects on environment ?
- b) List the sources of SO_x. Explain the principle and working of limestone injection process in the control of SO_x emission.
- c) Write a note on dispersion of air pollutants. **(5+4+3)**



3. a) What is green house effect ? Discuss the cause, consequence and control of green house effect.
b) Briefly explain the principle and application of wet scrubbers and electrostatic precipitators in the control of NO_x emission. (6+6)
4. a) List out the criteria and standards of water for potable purpose.
b) With the help of chemical reactions, explain the procedure for the determination of hardness of water.
c) What is hydrologic cycle ? Explain. (4+5+3)
5. a) Explain the chemical procedure used in the determination of nitrogen in waste water.
b) Discuss the allowed limits of radiological contaminants in water and their effect on human life when they are present in excess.
c) Explain the principle and gravimetric procedure for the determination of sulphate in water sample. (5+4+3)
6. a) What is MINAS ? Explain the MINAS specifications for sugarcane industries.
b) What is quality control ? Explain the function and responsibilities of quality control department in the pharmaceutical industry.
c) What are remote control systems ? How they are useful in chemical warfare ? (4+5+3)
7. a) Describe the importance and responsibilities of Quality assurance in a chemical industry.
b) Explain the utility of ISO 9000 system in quality control.
c) What is ASTM ? Illustrate the role of ASTM standards in controlling the quality with suitable example. (4+4+4)
8. a) What are explosives ? Bring out the procedure for the disposal of explosives in laboratory with an example.
b) What is the effect of leaking compressed gas cylinders? Explain the emergency response to be followed during the leaking of compressed gas cylinders.
c) Write a note on intellectual property rights. (4+4+4)
9. a) Describe the importance and procedure for verification and segregation of laboratory waste.
b) What are hazardous materials ? Explain the procedure for transportation and incineration of hazardous materials.
c) Why it is important to safeguard and secure the data properly ? Explain. (4+4+4)
-