AT–353

B.Sc. Part—II Semester–IV Examination

4S : INDUSTRIAL CHEMISTRY (R/V)

(Material Science and Industrial Pollution)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) Question No. **1** is compulsory and carries **8** marks

(2) Remaining all six questions carry **12** marks each.

(3) Draw well labelled diagrams wherever necessary.

(4) Use of scientific calculator is allowed.

1. (A) Fill in the blanks : 2

(i) Polyvinyl chloride is formed by polymerisation of _____ _____ .

(ii) Long form of T.O.S. as water quality parameter is _ _____ .

(iii) Fire clay bricks contain 50 to 60 percent _ _____ oxide.

(iv) Emission from motor vehicle is a major source of carbon _ _____ pollutant.

(B) Choose the appropriate answer from the given alternatives in each subquestion : 2

(i) Total dissolved solids can be reduced by which method ?

(a) Distillation (b) Ion exchange

(c) Electrolysis (d) All of these.

(ii) To manufacture cement by wet process, how much percent of water is used to prepare slurry.

(a) 5 to 10 % (b) 15 to 20%

(c) 50 to 60% (d) 30 to 40%

(iii) Most commercial glasses consist of :

(a) Lime (b) Soda

(c) Silica (d) All of these

(iv) Which of the following is primary air pollutant ?

(a) SO_x (b) NO_x

(c) CO_x (d) All of these.

(C) Answer the following questions in one sentence : 4

(i) Define Dissolved Oxygen (D.O.) ?

(ii) What is function of accelerators in cement ?

(iii) Give examples of two natural polymers.

(iv) Define addition polymerisation.

UNIT—I

2. (A) How are ceramics manufactured ? Describe the process with diagram. 4

(B) Give composition and properties of : 4

(i) Optical glass (ii) Soda lime glass.

(C) Give applications of fire clay bricks. Define refractories. 4

OR

3. (P) Give [illegible] ceramics. 4

(Q) Describe the [illegible] process of refractories. 4

(R) Give an account on raw material and composition of glass. 4

UNIT—II

4. (A) Describe wet process to manufacture cement. 4

(B) What is heat of hydration of cement ? Discuss in detail. 4

(C) Explain types of cement. 4

OR

5. (P) Give an account on additives for cement. 4

(Q) Explain the tests for compressive strength. 4

(R) Give raw materials and composition of cement. 4

UNIT—III

6. (A) Discuss thermosetting and thermoplastic polymers with example. 4

(B) Describe manufacturing process of teflon with diagram. 4

(C) How are polymers classified on basis of occurrence ? Discuss in detail. 4

OR

7. (P) Describe manufacturing process of poly vinyl chloride. 4

(Q) Give reactions and raw materials involved in manufacture of nylon 6 : 6. 4

(R) How are polymers classified on basis of polymerisation processes ? Discuss in detail. 4

UNIT—IV

8. (A) What is chemical oxygen demand of water ? How is it determined ? 4

(B) Explain sources and effects of phenols as water pollutant. 4

(C) Give IS and WHO parameter for water quality. 4

OR

9. (P) Discuss natural sources of water and their properties. 4

(Q) What is alkalinity of water ? How is it determined ? Explain. 4

(R) Discuss water pollution due to paper industry. 4

UNIT—V

10. (A) Explain following methods of waste water treatment :

(i) Sterilization (ii) Activated Sludge. 6

(B) Give principle, construction and working with diagram of trickling filter. 6

OR

11. (P) Explain coagulation and ion exchange as waste water treatment method. 6

(Q) Explain following methods for waste water treatment : 6

(i) Sedimentation (ii) Ion exchange.

UNIT—VI

12. (A) Discuss sources and effects of COx as air pollutant. 4

(B) Explain principle, construction and working of electrostatic precipitator. Draw labelled diagram. 4

(C) Discuss adsorption and absorption methods in air pollution monitoring. 4

OR

13. (P) Discuss sources and effects of SOx as air pollutant ? 4

(Q) Explain principle, construction and working of filter mist eliminator. 4

(R) Explain causes and effects of greenhouse effects. 4

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