AS–1379

B.Sc. (Part—I) Semester—II Examination
INDUSTRIAL CHEMISTRY (R/V)

Time : Three Hours]   [Maximum Marks : 80

N.B. :— (1) Question No. 1 is compulsory and carries 8 marks.

(2) Remaining all questions carry 12 marks.

(3) Give chemical equations and draw diagrams wherever necessary.

(4) Use of scientific calculator is allowed.

1.   (A) Fill in the blanks :—

(i) Physical adsorption is caused by intermolecular _____ force.

(ii) _____ is the unit operation that involves the concentration of a solution consisting a non-volatile solute and a volatile solvent.

(iii) The solute rich product of liquid-liquid extraction is called as _____ phase.

(iv) In size reduction, particles of solids are cut or broken into _____ pieces.   2

(B) Choose the correct alternative :—

(i) Milk is an example of :

(a) Sol   (b) Miscelles

(c) Gel   (d) Emulsion

(ii) A propeller is an :

(a) Axial flow, low speed impeller

(b) Radial flow, high speed impeller

(c) Axial flow, high speed impeller

(d) Radial flow, low speed impeller

1   (Contd.)

(iii) Which of the following statements with respect to catalysis is not true ?

    (a) A catalyst is specific in its action

    (b) A catalyst is more effective when finely divided

    (c) Change in temperature alters rate of catalysis

    (d) A catalyst remains changed in mass and chemical composition at the end of the reaction

(iv) Which one of the following is the most effective washing technique in filter presses ?

    (a) Simple washing   (b) Thorough washing

    (c) Partial washing   (d) Differential washing   2

(C) Answer in **ONE** sentence :

    (i) State Kick's law.

    (ii) Define filtration

    (iii) What is catalyst deactivation ?

    (iv) What do you mean by solubility ?   4

UNIT—I

2. (A) Discuss single and multiple effect evaporation.   4

   (B) Explain Bubble cap plate with suitable diagram.   4

   (C) Describe construction and working of agitated film evaporator.   4

OR

3. (P) Explain Flash distillation.   4

   (Q) Give an account of simple or differential distillation.   4

   (R) Draw the sketch of climbing film evaporator and explain it.   4

UNIT—II

4. (A) Discuss packed column extractor.   4

   (B) What do you mean by single and multistage extraction ? Explain.   4

   (C) Describe percolation tank.   4

OR

5. (P) Explain continuous countercurrent decantation. 4

(Q) Discuss the properties of a solvent to be used in liquid-liquid extraction. 4

(R) Describe construction and working of rotocel. 4

UNIT—III

6. (A) Explain the following :—

(i) Moisture content on wet and dry basis

(ii) Drying of porous solids. 6

(B) Give an account of Sweson-Walker crystalliser with its construction and working. 6

OR

7. (P) Discuss tray dryer with neat labelled diagram. 6

(Q) Describe construction and working of Oslo-Cooler crystalliser. 6

UNIT—IV

8. (A) What is Screening ? Distinguish between ideal and actual screens. 4

(B) Give the characteristics of filter medium. 4

(C) Discuss jaw crusher. 4

OR

9. (P) Describe grizzly screen with diagram. 4

(Q) Give an account of rotary drum filter. 4

(R) Explain smooth roll crusher. 4

UNIT—V

10. (A) Explain turbine impellers with their types. 6

(B) Discuss the mixing of solids with liquids and explain banbury mixer. 6

OR

11. (P) Give an account of double arm Kneader (Kneading machine). 6

(Q) Describe ribbon blender with its diagram. 6

UNIT—VI

12. (A) Discuss any four properties of a catalyst.   4

     (B) Explain with example :—

        (i) Autocatalysis

        (ii) Negative catalysis.   4

     (C) Give the applications of gels and emulsions.   4

OR

13. (P) Explain the mechanism of adsorption.   4

     (Q) Describe Langmuir adsorption isotherm.   4

     (R) Give an account of adsorption theory of catalysis.   4