(r) Discuss the following terms :

(i) Radiation

(ii) Absorptivity

(iii) Reflectivity

(iv) Transmissivity. 4

UNIT–VI

12. (a) State and explain continuity equation. 6

(b) Draw and explain the construction and working of venturimeter. 6

OR

13. (p) Discuss the Reynold's experiment with Reynold's number. 6

(q) Give construction and working of centrifugal pump. 6

AP–396

B.Sc. (Part–I) Semester–I Examination

1S : 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 **SIX** questions carry 12 marks each.

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

(4) Use of calculator is allowed.

1. (a) Fill in the blanks :

(i) Conversion is always based on _____ reactant.

(ii) The number of gram moles of solute dissolved in one liter of solution is called _____.

(iii) A body which absorbs all the incident radiation is called as _____ body.

(iv) Manometer is used for measurement of ___. 2

(b) Choose the correct alternatives :

(i) One of the following parameters is related to proximate analysis of coal :

(a) Sulfur (b) Hydrogen

(c) Nitrogen (d) Ash

(ii) When Microorganisms digest biomass in the absence of air, they produce either alcohol or ___ gas.

(iii) Electromagnetic radiation from the sun is ____ energy.

(a) Wind (b) Solar
(c) Hydro (d) None of these

(iv) The separation of components of liquid mixture with the help of suitable solvent is carried out by :

(a) Distillation (b) Extraction
(c) Crystallization (d) Filtration. 2

(c) Answer in **one** sentence :

(i) Define fluid mechanics.

(ii) What are the uses of valves ?

(iii) Why anthracite coal is considered to be the highest rank of coal ?

(iv) Define stoichiometry. 4

UNIT–I

2. (a) Define :

(i) Normality

(ii) Equivalent weight

(iii) Molarity

(iv) Molecular weight. 4

7. (p) Discuss the Biomass energy. 4

(q) Explain the following terms :

(i) Heat of reaction

(ii) Heat of formation. 4

(r) Discuss Tidal power. 4

UNIT–IV

8. (a) Discuss the proximate and ultimate analysis of coal. 6

(b) Give the classification and origin of petroleum. 6

OR

9. (p) Explain the coal formation. 6

(q) Discuss the mining of petroleum and uses of petroleum. 6

UNIT–V

10. (a) State and explain Fourier's Law. 4

(b) Discuss Filmwise and Dropwise condensation. 4

(c) Explain concept of heat conduction. 4

OR

11. (p) Describe the phenomenon of pool boiling. 4

(q) Draw and explain the U-tube heat exchanger. 4

(b) Find the equivalent weight of :

(i) H_2SO_4

(ii) NaOH

(iii) HCl

(iv) Na_2CO_3

[Atomic weight : Na = 23, C = 12, O = 16, S = 32, Cl = 35.5]. 4

(c) Find grams of HCl needed to prepare 1 liter 2NHCl solution. 4

OR

3. (p) 98 grams of sulphuric acid (H_2SO_4) are dissolved in water to prepare one liter of solution. Find normality and molarity of the solution. 4

(q) Explain the terms :

(i) Molality

(ii) Multiple units

(iii) Derived physical quantities

(iv) Mole fraction. 4

(r) Find molecular weight of :

(i) H_2SO_4

(ii) Na_2CO_3

(iii) $KMnO_4$

(iv) NaOH. 4

UNIT–II

4. (a) Explain the following terms :

(i) Conversion

(ii) Yield. 4

(b) Give the overall and individual material balance for distillation process. 4

(c) Define extraction. Explain the material balance for extraction with suitable example. 4

OR

5. (p) Explain the following terms with example :

(i) Stoichiometric coefficient

(ii) Stoichiometric ratio. 4

(q) Formaldehyde is produced from methanol in catalytic reactor. The production rate of formaldehyde is 1000 kg/h. If conversion of methanol is 65%, calculate the feed rate of methanol.

Reaction : $CH_3OH \rightarrow HCHO + H_2$ 4

(r) Discuss the limiting and excess reactant. 4

UNIT–III

6. (a) Discuss the heat of solution and heat of combustion. 4

(b) Give the general idea about conventional energy sources. 4

(c) Explain the production of electricity by solar energy. 4

OR