

(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

IS : 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. 5

OR

9. (p) Explain the coal formation. 6
(q) Discuss the mining of petroleum and uses of petroleum. 6

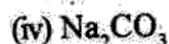
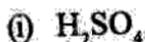
UNIT-V

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 :



[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 :

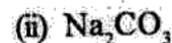
(i) Molality

(ii) Multiple units

(iii) Derived physical quantities

(iv) Mole fraction. 4

(r) Find molecular weight of :



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 : $\text{CH}_3\text{OH} \rightarrow \text{HCHO} + \text{H}_2$ 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