

B.Sc. (Part-II) Semester-III Examination
3S : INDUSTRIAL CHEMISTRY (R/V)
(Unit Processes and Process Equipments)

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) Give chemical equations and draw diagram wherever necessary.
(4) Use of calculator is allowed.

1. (A) Fill in the blanks :—

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- (i) In hydrogenation of vegetable oil, glycerides of unsaturated fatty acid are converted into glycerides of _____ acid.
- (ii) The mixed acid used in nitration is composed of HNO_3 and _____.
- (iii) McLeod gauge is generally used in the measurement of high _____.
- (iv) Composting is the aerobic and _____ decomposition of organic matter present in the refuse by microorganisms.

(B) Choose the correct alternative :—

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- (i) Halogenation reactions involve the use of :
 - (a) Chlorine
 - (b) Bromine
 - (c) Iodine
 - (d) All of these
- (ii) Which of the following is not an oxidising agent ?
 - (a) KMnO_4
 - (b) $\text{K}_2\text{Cr}_2\text{O}_7$
 - (c) HCl
 - (d) HNO_3
- (iii) Evolution of hydrogen type corrosion occurs in this environment :
 - (a) Acidic
 - (b) Basic
 - (c) Neutral
 - (d) All of these
- (iv) Which of the following is a vigorous hydrogenation catalyst ?
 - (a) Copper
 - (b) Nickel
 - (c) Palladium
 - (d) Platinum

(C) Answer in **ONE** sentence :—

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- (i) What is sulphonation ?
- (ii) Why the hardening of vegetable oil is carried out ?
- (iii) Give the sources of radioactive waste.
- (iv) Define passivity.

UNIT—I

2. (A) What is alkylation ? Discuss any three alkylating agents. 4
(B) Explain the manufacture of m-nitroaniline. 4
(C) Give an account of continuous nitration. 4

OR

3. (P) Discuss the manufacture of p-nitroacetanilide from acetanilide. 4
(Q) Describe cathodic reduction method of amination. 4
(R) Explain the vapour phase mechanism of alkylation. 4

UNIT—II

4. (A) Give an account of sulphonation of benzene. 4
(B) What is bromination ? Explain any three types of brominating agent. 4
(C) Discuss the thermodynamics of hydrolysis. 4

OR

5. (P) Explain any four factors affecting sulfonation. 4
(Q) Give an account of various hydrolysing agents. 4
(R) Discuss the manufacture of chlorobenzene. 4

UNIT—III

6. (A) Explain the manufacture of benzoic acid. 4
(B) Discuss the manufacture of methanol from carbon monoxide and hydrogen. 4
(C) What is esterification ? Explain the esterification of organic acid with olefin. 4

OR

7. (P) Give an account of vigorous and mild hydrogenation catalysts. 4
(Q) Discuss the manufacture of vinyl acetate. 4
(R) What is oxidation ? Explain any three types of oxidative reactions. 4

UNIT—IV

8. (A) Draw and explain glass thermometer. 4
(B) Discuss float type liquid level gauge. 4
(C) Draw and explain manometer. 4

OR

9. (P) Describe radiation pyrometer with diagram. 4
(Q) Give an account of Pirani gauge used in the measurement of pressure. 4
(R) Explain bell type liquid level gauge. 4

10. (A) Give the mechanism of corrosion by hydrogen evolution. 4
(B) Describe underground corrosion. 4
(C) Draw and explain manufacturing process of oil paints. 4

OR

11. (P) Define corrosion. Discuss galvanic corrosion. 4
(Q) Discuss the factors affecting corrosion. 4
(R) Describe chemical and physical passivity. 4

UNIT—VI

12. (A) Define solid waste. Explain the types of solid waste with suitable examples. 4
(B) Explain composting as a solid waste treatment. 4
(C) Discuss biomedical waste. 4

OR

13. (P) Explain the method of industrial solid waste treatment and disposal by incineration. 4
(Q) Describe the types of hazardous solid waste. 4
(R) Give an account of recycling and reuse of solid waste. 4

