

- (b) Explain intergranular corrosion along with its mechanism and causes. Write the measures to prevent this corrosion.

8×2=16

7. (a) What is corrosion fatigue ? How can this corrosion be controlled ? Explain the mechanism.
- (b) Explain microbial induced corrosion in detail.

8×2=16

Unit IV

8. (a) Explain the process of corrosion in boilers and condensate pipe lines.
- (b) Write in detail about the corrosion due to acid.

8×2=16

9. (a) What is process of atmospheric corrosion in fertilizer industries ? Explain.
- (b) Write in detail about the process of corrosion during metal surface cleaning and descaling.

8×2=16



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M.Sc. EXAMINATION, 2025

(Fourth Semester)

(2023-24 Onwards)

(Regular & Re-appear)

CHEMISTRY

Physical Chemistry Special-VI

Electrochemistry and Corrosion

Time : 3 Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Define Crevice Corrosion.
- (b) Write the equation relating ionic drift velocity and current density.

- (c) Define corrosion potential.
- (d) Write the preventive measures for intergranular corrosion.
- (e) What is wet and dry corrosion ?
- (f) Explain Walden's Rule briefly.
- (g) Define corrosion current density.
- (h) What is uniform corrosion ? $2 \times 8 = 16$

Unit I

- 2. (a) Explain the rate process approach for ionic conductivity in detail.
- (b) State and derive Nernst-Einstein equation.
 $8 \times 2 = 16$
- 3. (a) Write down the Planck-Henderson equation for potential diffusion.
- (b) Derive the relationship between ionic drift and diffusion potential. $8 \times 2 = 16$

Unit II

- 4. (a) What are Pourbaix diagram ? Explain Pourbaix diagram of any metal and explain advantages of these diagrams.
- (b) What is mixed potential theory ? Make use of mixed potential theory to describe polarization of a corroding electrode.
 $8 \times 2 = 16$
- 5. (a) What do you mean by concentration polarization ? Show the concentration polarization of anode.
- (b) What are Tafel slopes ? How can we measure corrosion rate using these slopes ? $8 \times 2 = 16$

Unit III

- 6. (a) What is stress corrosion ? What are the causes of stress corrosion ? Explain its mechanism and prevention methods.