



THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

PGC 5525

PHYSICAL CHEMISTRY-III

Max: 75 mks

Time: 3 hrs

SECTION A

Answer ANY FIVE questions

(5 X 15 = 75)

1. a) Derive Onsager reciprocity equation. Validate and verify Onsager equation. (9)
b) How will you determine the fugacity of real gas? (6)
2. How did Hinshelwood overcome the difficulty faced by Lindemann-Christiansen hypothesis and discuss the contribution made by RRK theory to unimolecular reactions in detail.
3. Explain and Derive Debye-Huckel Onsager equation.
4. Derive Butler-Volmer equation. Discuss the significance of Tafel plots.
5. Define liquid junction potential. How does it arise? Derive an expression for the same. How it can be eliminated?
6. a) Derive Stern-Volmer equation for the bimolecular collisional quenching. (7)
b) Using Frank-Condon principle explain the shift in O-O transition due to solvent interaction in two states of different polarity. (8)
7. a) Discuss the theories of hydrogen overvoltage. (7)
b) What do you mean by chemical potential? Derive Gibbs-Duhem equation. (8)
