



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

CHE/CHS 3615

PHYSICAL CHEMISTRY-IV

Time: 3 Hours

Max Marks: 75

Answer **ANY FIVE** Questions

(5 X 15 = 75)

- Derive Bohr equation for the energy of electron in hydrogen like atom. (10)
 - Describe Sommerfeld's extension of Bohr theory. (5)
- Discuss the characteristics of any five operators in quantum mechanics.? (5)
 - Solve the Schrödinger wave equation of a particle in an infinite one-dimensional box of width 'a'. (10)
- Derive Mark-Kuhn-Houwink equation and explain how it helps us to determine the molecular weight of polymers.
 - What are conducting polymers? Discuss the electrical conductivity of polyacetylene
- Derive Gibb's phase rule. (8)
 - With neat diagram explain the phase diagram of water system. (7)
- Enumerate the applications of self-assembled monolayers. (5)
 - What is CNT? Differentiate between single walled and multi walled CNTs and discuss their applications (10)
- Describe the Milliken's oil drop technique. (5)
 - What are the postulates of quantum mechanics? (5)
 - Explain a system with more than two Eutectic temperatures with appropriate phase diagram. (5)
- Describe the determination of molecular weight of a polymer by light scattering method. (10) b) Discuss the role of nanopores in medicine. (5)
