

2021

**CHEMISTRY**

*(Physical Chemistry)*

[ **Honours** ]

PAPER – VII

*Full Marks : 45*

*Time : 2 hours*

*The figures in the right hand margin indicate marks*

*Candidates are required to give their answers in their own words  
as far as practicable*

*Illustrate the answers wherever necessary*

GROUP – A

Answer any **one** of the following questions : 5 × 1

1. Define stokes and antistokes lines in Raman spectra. 5
2. Entropy is the logarithmic function of thermodynamic probability. Explain. 5

GROUP – B

Answer any **two** of the following questions : 20 × 2

3. Draw and explain 1st four wave function of a particle in 1D box. Find out the expectation value of position and momentum of a particle in 1D box. 20
4. Distinguish between photophysical and photochemical process. Explain different types of photophysical processes by Jablonski diagram. 20
5. Derive Einstein equation for heat capacity of solid elements. Hence show that Dulong-Petit law is a special case of Einstein. What is Debye T<sup>3</sup> law ? 20
6. State Gibbs phase rule and explain the terms. Draw and explain phase diagram of water. 20