Supplementary exam.

Reg. No.										

MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

DEPARTMENT OF SCIENCES, I SEMESTER M.Sc. CHEMISTRY
END SEMESTER EXAMINATIONS, JULY 2020

PHYSICAL CHEMISTRY I [CHM 4105]

(REVISED CREDIT SYSTEM-2017)-- Online

Time: 2 hrs | Date:14-07-2020 | MAX. MARKS: 25

Note: (i) Answer **ALL** questions
(ii) Draw diagrams, and write equations wherever necessary.

1. **(a)** Ether boils at 306.5 K at one atmosphere pressure. At what temperature will it boil at a pressure of 750mm, given that the heat of vaporization of ether is 369.86 joules per gram.
(b) Discuss the Bjerrum's theory of ion association and list the outcomes of it. **[1+4]**
2. Deduce Gibbs – Duhem equation. Give its significance. **[5]**
3. **(a)**Discuss the application of the condensed phase rule to the study of succinic nitrile-water- alcohol between 18.5°C and 31°C.
(b) With suitable graphical representation, explain the concentration variation profile of a consecutive reaction. What is meant by induction time of a consecutive reaction? **[2+3]**
4. Derive the rate expression for branched chain reaction. Deduce the conditions for explosion. **[5]**
5. What are the assumptions of B.E.T adsorption isotherm? How this adsorption isotherm is used for the determination of surface area of the catalyst? Explain the mechanism of specific acid catalysis and derive suitable mathematical expression for the same. **[5]**