Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

III SEMESTER B.TECH. (CHEMICAL ENGINEERING)

END SEMESTER EXAMINATIONS, DECEMBER 2022

SUBJECT: PHYSICAL AND ORGANIC CHEMISTRY [CHM 2151]

REVISED CREDIT SYSTEM

MAX. MARKS:50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

Q1. I) Derive first order rate constant expression.
ii) Explain the solution properties of chloroform and acetone system showing negative deviation from Raoult's law.(4)

Q2. Derive an equation for the following.
i) The relationship between the free energy of a component of a liquid and free energy in its vapor.
ii) The relationship between the depression in freezing point to the mole fraction of the solute. (4)

Q3. Differentiate between order and molecularity of reaction. (2)

Q4.i) Explain the phase diagram of one component system.
ii) Explain the conductometric titration of mixture of acids against standard sodium hydroxide solution.(4)
Q5. i) Explain the capillary rise method to determine the surface tension.
ii) Explain the phase diagram of two component system forming a eutectic mixture (4)
Q6.Explain the Solubility of phenol water system with temperature. (2)

Q7. Discuss any two types of dyes classified based on applications (4)
Q8. Explain the following:
i) Primary and secondary structure of proteins
ii) Discuss the classification of amino acids. (4)

Q9. Write the structure of Maltose. (2)

Q10. i) Explain the mechanism of electrophilic substitution for the nitration of benzene.

ii) Discuss Arrhenius and Brønsted-Lowry theory of acids and bases with suitable examples (4)

Q11. i) Write the structure and stability of carbanions.

ii) With a suitable example discuss the RS configuration. (4)

Q12. Discuss the structure and basicity of furan and thiophene. (2)

Q13. i) Discuss any two types of structural isomers.

ii) Write pinacol pinacolone and wager meerwein rearrangement reactions of carbocations. (4)

Q14. i) Write the description of the molecular orbital theory of dyes.

ii Discuss the uses of cellulose nitrates and cellulose acetate. (4)

Q15. Explain the hybridization and resonance effect on the acidity of molecules. (2)