



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech.
Branch Code: CHE	Pattern: 2023
Name of Course: Chemical Reactions and Synthesis II	Course Code: 2307212
Max. Marks: 30	Duration: 1.15 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 01 page.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1 a) Discuss any two parameters used to measure efficiency of green chemistry. (4) CO1
- 1 b) Explain cyclic structure of  $\alpha$ -D (+) Glucopyranose (3) CO1

**Question No. 2**

- 2 a) Give the traditional and green pathway for synthesis of adipic acid (4) CO1
- 2 b) Give the traditional and green pathway for synthesis of polycarbonate (4) CO1

**OR**

- 2 c) Discuss any two factors that affect rate of enzyme catalysed reaction (4) CO1
- 2 d) Explain how the structural differences in components of starch affect the solubility (4) CO1

**Question No. 3**

- 3 a) Why do transition metals exhibit variable oxidation states? Explain the factors that contribute to this property (4) CO2
- 3 b) Discuss the postulates of Werner's theory of coordination compounds. (3) CO2

**Question No. 4**

- 4 a) Which compounds (i)  $[\text{Mn}(\text{CO})_5]$  (ii)  $[\text{Fe}(\text{CN})_6]^{4-}$  obeying and disobeying the EAN rule (Atomic number of Mn and Fe are 25 and 26) (4) CO2
- 4 b) Write IUPAC name of the given complex (i)  $[\text{Ag}(\text{NH}_3)_2]^+$  (ii)  $[\text{Co}(\text{NH}_3)_4 \text{Cl}_2]^{+1}$  (4) CO2

**OR**

- 4 c) Using VBT, explain the type of hybridization, geometry and magnetic property of  $[\text{NiCl}_4]^{2-}$  (4) CO2
- 4 d) Discuss the crystal field splitting of d-orbitals in octahedral complexes with diagram (4) CO2

..... End of question paper.....