



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE
 (AUTONOMOUS) (Grant-in-Aid)
 Affiliated to Sardar Patel University
 VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester II) Internal Examination-2025

SUBJECT CODE:US02IDCHE01SUBJECT NAME: FUNDAMENTALS OF CHEMISTRY-II

Date : 06-03-2025

Day : THURSDAY

Time : 12.45 P.M. TO 01.45 P.M.

Total marks : 20

Note: Figures to the right indicate marks of the question.

Q-1	Write the most appropriate answer from the following multiple-choice questions.	[6]
1	In a co-ordination compound primary valency of a central metal ion is satisfied by : (a) Cation (b) Anion (c) Radical (d) Ligand	
2	Which of the following is used as a catalyst in Friedal-Craft alkylation? (a) Lewis base (b) Zn/Hg, HCl (c) Fe/HCl, heat (d) Lewis acid	
3	Which of the following is use as a catalyst for the nitration of benzene. (a) Conc. HNO ₃ (b) Both Conc. HNO ₃ and Conc. H ₂ SO ₄ (c) Conc. H ₂ SO ₄ (d) None of these.	
4	In Arrhenius plot, intercept is equal to (a) - E _a /R (b) ln k (c) log ₁₀ a (d) ln A	
5	What is the relation between the order of the reaction and stoichiometric coefficients of reactant? (a) no relationship (b) inversely proportional (c) directly proportional to the square (d) directly proportional	
6	Which of the following are the units of the rate constant k of the second order reaction? (a) liter / mole (b) sec ⁻¹ liter / mole (c) sec ⁻¹ (d) sec ⁻¹ mole / liter	
Q-2	(A) In the co-ordination compound [Cr(en)₃][Ni(CN)₆] : (a) The oxidation state of chromium ion and nickel ion are ____ and ____ respectively. (b) The co-ordination number of chromium ion and nickel ion are ____ and ____ respectively. (c) The dentate character of different ligands are ____ and ____. (d) Ionic charge on complex cation and complex anion are ____ and ____. (e) IUPAC name of the compound is ____. (B) What are the limitations of Friedel-Crafts alkylation?	[7]
	OR	
Q-2	(A) Write IUPAC name for : (i) [Cr(H₂O)₄Cl₂]Br (ii) [Pt^{II}(en)₂] [PtCl₆] (B) Give detail stepwise reaction mechanism for sulphonation of benzene.	[7]
Q-3	(A) How elementary processes are classified? (B) Rate constant of decomposition of azomethane is 0.0231 min⁻¹. This reaction is of first order. CH₃-N=N-CH₃ → C₂H₆ + N₂ (1) What fraction of azomethane will be decomposed in 1.5 hours? (2) How long will it take to be 60% completed?	[7]
	OR	
Q-3	Answer the following (A) What is an integrated rate law? Derive integrated rate for second order reaction. (B) For reaction : C₂H₅I + OH⁻ → C₂H₅OH + I⁻ K = 5.03 × 10⁻² M⁻¹Sec⁻¹ at 289° K and K = 6.71 M⁻¹ Sec⁻¹ at 333° K. What is the activation energy of the reaction? (Given : R = 1.987).	[7]