

**GURU NANAK INSTITUTE OF TECHNOLOGY**

An Autonomous Institute under MAKAUT

2020-2021

**Chemistry-2 (Backlog)****CH(FT)302****TIME ALLOTTED: 3 HOURS****FULL MARKS: 70***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable***GROUP – A****(Multiple Choice Type Questions)**Answer any *ten* from the following, choosing the correct alternative of each question: **10×1=10**

		<b>Marks</b>	<b>CO No</b>
1	(i) Which of the following is a bidentate ligand? a) Ammonia b) Triethylene c) Ethylene diamine d) H <sub>2</sub> O	01	CO5
	(ii) Which one has highest dipole moment? (a) CH <sub>3</sub> I (b) CH <sub>3</sub> Br (c) CH <sub>3</sub> F (d) CH <sub>3</sub> Cl	01	CO4
	(iii) [Co(NH <sub>3</sub> ) <sub>5</sub> Br]SO <sub>4</sub> and [Co(NH <sub>3</sub> ) <sub>5</sub> SO <sub>4</sub> ] Br are the example of (a) Coordination isomer (b) Ionization isomer (c) Linkage isomer (d) Hydration isomer	01	CO5
	(iv) Zinc phosphide is an example of (a) Fumigant (b) Fungicide (c) Rodenticide (d) Antibiotic	01	CO3
	(v) EDTA is an example of (a) Monodentate ligand (b) Bidentate ligand (c) Hexadentate ligand (d) Tetradentate ligand	01	CO5
	(vi) In the Friedel-craft reaction the catalyst used is a (a) Lewis base (b) Lewis acid (c) Metal oxide (d) Organometallic compound	01	CO4

(vii)	Ionic product of water $K_w$ depends on (a) concentration (b) volume (c) temperature (d) density	01	CO1
(viii)	If the concentration of nucleophile is increased the rate of $S_N1$ reaction (a) increases (b) decreases (c) remains same (d) None of the above	01	CO4
(ix)	Which one of the following is not a colligative property? (a) Elevation of boiling point (b) Depression of freezing point (c) Osmotic pressure (d) Lowering of vapour pressure	01	CO1
(x)	Which of the octahedral complexes show optical isomerism (M= metal atom, A,B ligands) (a) $[MA_6]$ (b) $[MA_5B]$ (c) $[MA_4B_2]$ (d) $[MA_3B_3]$	01	CO5
(xi)	Nature of the salt of strong acid and strong base is (a) acidic (b) basic (c) neutral (d) first acidic then basic	01	CO1
(xii)	Tyndal effect will be observed in (a) solution (b) precipitate (c) colloidal sol (d) vapour	01	CO3

**GROUP – B**

**(Short Answer Type Questions)**

Answer any *three* from the following:  $3 \times 5 = 15$

		<b>Marks</b>	<b>CO No</b>
2.	(a) Write the plausible products of the $S_N1$ solvolysis of 3-chlorobut-1-ene.	5	CO4
3.	(a) What is red shift and blue shift in UV-Vis spectroscopy? Give examples.	3	CO2
	(b) What is chemiluminiscence?	2	CO2
4.	(a) $[CoF_6]^{3-}$ is paramagnetic but $[Co(NH_3)_6]^{3+}$ is diamagnetic. Explain.	5	CO5
5.	(a) Compare the basicity of 2,6-dimethyl-4-nitroaniline and N,N-2,6-tetramethyl-4-nitroaniline.	5	CO4
6.	(a) What is Pinacol-pinacolone rearrangement? Explain with mechanism.	5	CO4

**GROUP – C**  
**(Long Answer Type Questions)**

Answer any *three* from the following: **3×15=45**

		<b>Marks</b>	<b>CO No.</b>
7.	(a) Draw and level all types of fundamental vibrations present in polyatomic molecule. What is the significance of finger print region in IR spectroscopy?	5	CO2
	(b) Write down the formula of Potassium dicyanoargentate(I). What is the oxidation number of Fe in $K_3[Fe(C_2O_4)_3]$ .	3	CO5
	(c) Describe the mechanism of Electrophilic substitution reaction of benzene with example. Why nitro benzene gives meta- oriented products?	7	CO4
8.	(a) Explain the splitting of <i>d</i> orbitals in tetrahedral field with proper diagrams.	5	CO5
	(b) What is the effect of solvent on the absorption maxima of UV-Vis spectroscopy?	5	CO2
	(c) What is chemical shift? How does its value change with the presence of –I group?	5	CO2
9.	(a) Benzene undergoes substitution reaction rather than addition reaction. Justify.	5	CO4
	(b) What is benzoin condensation? Describe with mechanism.	5	CO4
	(c) How the carbonyl compounds can be reduced? Explain any two reduction reactions with mechanism.	5	CO4
10.	Write short notes on (any three)	3×5	
	(a) Friedel Craft's reaction		CO4
	(b) NGP reaction		CO4
	(c) Lyophobic and lyophilic sols		CO1
	(d) Van't Hoff's equation		CO1
	(e) Chromophore and auxochrome		CO2
11.	(a) What is the effect of steric repulsion on the absorption maxima in UV spectroscopy? Explain with example.	5	CO2
	(b) What is carbanion? How are they formed? Give some examples.	5	CO4
	(c) Draw the energy profile diagram of $S_N1$ and $S_N2$ reaction.	5	CO4