SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

B. Tech (EC/EE/CE/ME/BT/CS (Cloud computing & Artificial Intelligence)/CS (Data Science & Artificial Intelligence)
I Year (I Sem)

Course Name: Chemistry	**Code: BCY1701**
Time: 02 Hours	**Max Marks: 60**

University Roll No.															

(To be filled by the Student)

Note: Please read instructions carefully:

a) *The question paper has 03 sections and it is compulsory to attempt all sections.*

b) *All questions of Section A are compulsory; questions in Section B and C contain choice.*

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Show crystal field splitting of *d*-orbital in octahedral and tetrahedral complexes.	BL2	CLO3	02
2.	What is meant by fluorescence?	BL1	CLO2	02
3.	What are the differences between ideal gas and real gas?	BL1	CLO3	02
4.	Calculate standard electrode potential at 298K for following chemical cell: $Zn\|Zn^{+2}\|\|Cu^{+2}\|Cu$ [Given: $E^{o}Zn^{+2}\|Zn$= 0.46V, $E^{o}Cu^{+2}\|Cu$= 0.25V.]	BL3	CLO3	02
5.	Define optical activity.	BL1	CLO4	02
Section B: Short Answer Type Questions **Attempt any 03 out of 06 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Calculate the energy levels of the cyclobutadiene molecule by using Huckel molecular orbital theory.	BL3	CLO3	10
2.	Explain selection rules of spectroscopy. Out of NO, HCl, H_2 and N_2 which will exhibit pure rotational spectra?	BL2	CLO2	10
3.	What are the differences between covalent and van der Waals interactions?	BL1	CLO3	10
4.	What is corrosion? Discuss the mechanism of electrochemical corrosion.	BL2	CLO3	10
5.	Compare between configuration and conformation.	BL2	CLO4	10
6.	Outline a reaction sequence for the formation of paracetamol?	BL2	CLO4	10

Section C: Long Answer Type Questions **Attempt any 01 out of 04 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Explain band theory and Calculate CFSE in Δ_o unit for octahedral complexes $[Co(NH_3)_6]^{3-}$ and $[Co(F)_6]^{3-}$.	BL3	CLO3	20
2.	The pure rotational spectrum of gaseous HCl consists of a series of equally spaced line separated by 10.8 cm^{-1}. Find the internuclear distance of the molecule. The atomic masses are : ^{1}H=1.67 X 10^{-27} Kg ; ^{35}Cl=58.06 x 10^{-27} Kg.	BL3	CLO2	20
3.	Explain the terms ionisation energy, electron affinity and electronegativity. How do the ionization energy and electron affinity of the elements vary as we move (i) along a period & (ii) down a group and why?	BL2	CLO1	20
4.	Distinguish S_N1 and S_N2 substitution reactions using suitable examples.	BL4	CLO4	20
