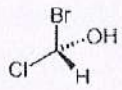
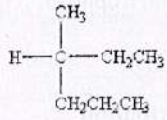
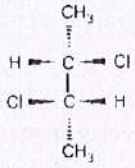
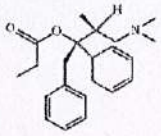
Exam Feb 2023

Exam Code-1221

Subject Code- CH10516 (CHEMISTRY)

Time: 3 hrs. MM: 70

S. No		Questions	Marks	CO	BL	PI
Q1	(a)	Write any four principles of green chemistry.	2	5	1	7.1.2
	(b)	Assign absolute configuration to the chiral carbon present in the following molecules a  b  c  d 	2	1	2,3	1.2.1
	(c)	Identify shape, geometry and type of hybridisation of the following molecules SF_4, SO_3, PO_4^{2-} with suitable diagrams.	3	1	1,3	1.2.1
	(d)	Draw molecular orbital diagrams and give the information about bond order and magnetic nature of the following molecule: N_2, NO, F_2, HCl.	7	1	1,3	1.2.1
		OR				
	(e)	I. Draw Sawhorse and Newman projections of ethane and butane. II. For the compound-2, 3-dichloropentane ($CH_3CH_2CHClCHClCH_3$), a) Draw stereochemical formulas for all the possible stereoisomers, b) Label pair of enantiomers, c) Give R/S designation for each of the stereoisomers.	4+3	1	2,3	1.2.1
Q2	(a)	Giving reaction, compare calgon condition and phosphate conditioning?	2	2	2	1.2.1
	(b)	Presenting chemical reaction, describe any one method of disinfection of water.	2	2	1	1.2.1
	(c)	Draw the chemical structure of the following: I. Metal-EDTA complex II. Eriochrome black –T (EBT) indicator III. Methyl orange Indicator	3	2	1	1.2.1
	(d)	A water sample contains the following salts: $Ca(HCO_3)_2$ = 203 mg/L, $Mg(HCO_3)_2$ = 95 mg/L, $CaSO_4$ = 136 mg/L, $MgCl_2$ = 95 mg/L, $CaCl_2$ = 111 mg/L, KCl = 100 mg/L Calculate the temporary and permanent hardness of water in ppm.	7	2	2,3	1.2.1
		OR				
	(e)	Describe Lime-Soda method of softening of water under following head: (i) Principle (ii) Chemical reactions (iii) Labelled diagram (iv) Advantages	7	2	2	1.2.1
Q3	(a)	Write definition and significance of Drop Point of semi solid lubricants.	2	3	1	1.2.1
	(b)	Giving example, explain principle involved in bimetallic corrosion.	2	3	2	1.2.1
	(c)	Illustrating various examples, write an informative note on Solid Lubricants	3	3	1	1.2.1
	(d)	I. Enlisting various types, write the functions of Greases. II. A lubricating oil of unknown viscosity-index has the Saybolt Universal Viscosity of 60 seconds at 210°F and of 400 seconds at 100°F. The standard pennysylvanian oil has Saybolt Universal Viscosity of 60 seconds at 210°F and 300 seconds at 100°F. The standard gulf oil has a Saybolt Universal Viscosity of 60 seconds at 210°F and 800 seconds at 100°F. Calculate the viscosity-index of oil.	4+3	3	2,3	1.2.1
		OR				
	(e)	Explain, How the nature of metal and environment influencing rate of corrosion?	7	3	2	1.2.1
Q4	(a)	Giving example of each, discuss the classification of nano materials.	2	3	1	1.2.1
	(b)	Giving example of each, define Thermoplastics and Thermosettings.	2	3	1	1.2.1
	(c)	Differentiate between Addition and condensation polymerization.	3	3	2	1.2.1
	(d)	What are Smart Materials? Giving principle of each discuss applications of any five smart materials.	7	3	2	1.2.1
		OR				
	(e)	Taking suitable example, explain how the Cationic and Anionic mechanism of polymerization carried out.	7	3	2	1.2.1

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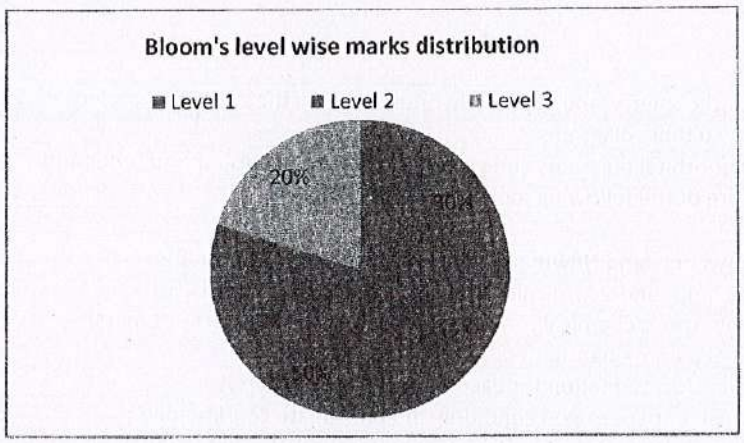
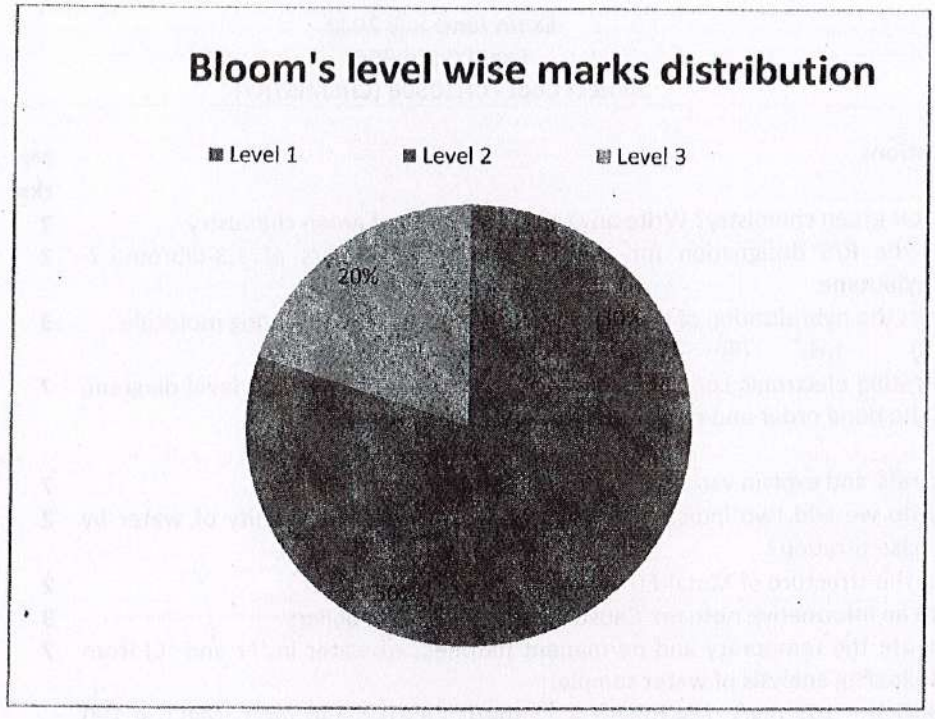
Q5	(a)	Draw and define: Electromagnetic Spectrum.	2	4	2	1.2.1
	(b)	Discuss various absorption and intensity shifts observed in UV-visible spectrum.	2	4	2	1.2.1
	(c)	Predict the no. of fundamental vibrational modes in the following molecules: (i) CO_2 (ii) H_2S (iii) C_2H_2	3	4	2	1.2.1
	(d)	Write the principle of IR spectroscopy and describe various molecular vibrations involved in the technique.	7	4	3	1.2.1
		OR				
	(e)	Discuss Gas-Liquid Chromatography under following heads: (i) Principle involved (ii) Schematic diagram of apparatus (iii) Applications	7	4	2	1.2.1



Exam June-July 2022
Exam Code-956
Subject Code- CH10506 (CHEMISTRY)

Time: 3 hrs. **MM: 70**

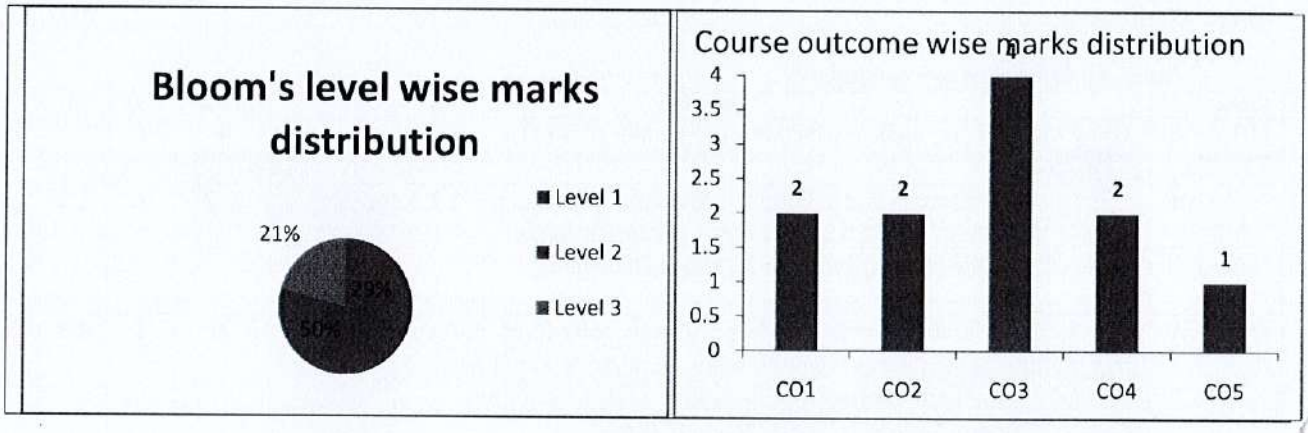
S. No		Questions	Marks	CO	BL	PI
Q1	(a)	What is green chemistry? Write any three principles of green chemistry.	2	1	1	7.1.2
	(b)	Give the R/S designation for each of the stereoisomers of 1,3-dibromo-2-methylbutane.	2	1	2,3	1.1.1
	(c)	Predict the hybridization of central atom and shape of the following molecule: (i) NH_4^+ (ii) H_2O (iii) $SnCl_2$	3	1	1,3	1.2.1
	(d)	Illustrating electronic configuration and molecular orbital energy level diagram, find the bond order and magnetic behaviour of NO.	7	1	1,3	1.2.1
		OR				
	(e)	Illustrate and explain various conformational isomers of *n*-butane.	7	1	2,3	1.2.1
Q2	(a)	Why do we add two indicators during determination of alkalinity of water by acid base titration?	2	1,2	2	1.2.1
	(b)	Draw the structure of Metal-EDTA complex and Indicator EBT.	2	1,2	1	1.2.1
	(c)	Write an informative note on: Caustic Embrittlement in boilers.	3	1,2	1	1.2.1
	(d)	Calculate the temporary and permanent hardness of water in °Fr and °Cl from the following analysis of water sample: $Ca(HCO_3)_2$ = 165 mg/L, $Mg(HCO_3)_2$ = 73 mg/L, $CaSO_4$ = 140 mg/L, $MgCl_2$ = 100 mg/L, $MgSO_4$ = 50 mg/L, $CaCl_2$ = 139 mg/L, KCl = 100 mg/L	7	2	2,3	1.1.1
		OR				
	(e)	Describe ion exchange method of softening of water under following head: (i) Principle involved (ii) structure of resins and chemical reactions (iii) labelled diagram (iv) Advantages and disadvantages.	7	1,2	2	1.2.1
Q3	(a)	Giving significance, define Flash point of an oil.	2	3	1	1.2.1
	(b)	Write an informative note on waterline corrosion.	2	1,3	1	1.2.1
	(c)	Give reason why Steel bolts should not be used in Copper equipments?	3	1,3	2	1.2.1
	(d)	I. Explain, types and significance of Cutting fluids. II. A lubricating oil of unknown viscosity-index has the Saybolt Universal Viscosity of 60 seconds at 210°F and of 60 seconds at 100°F. The standard pennysylvanian oil has Saybolt Universal Viscosity of 60 seconds at 210°F and 500 seconds at 100°F. The standard gulf oil has a Saybolt Universal Viscosity of 60 seconds at 210°F and 800 seconds at 100°F. Calculate the viscosity-index of oil.	3+4	1,3	2,3	1.1.1
		OR				
	(e)	Taking suitable example, explain electrochemical theory of wet corrosion in detail.	7	1,3	2	1.2.1
Q4	(a)	Giving chemical structure of Polyester, discuss its uses.	2	1,3	1	1.2.1
	(b)	Giving function of each, discuss any two types of smart material.	2	3	1	1.2.1
	(c)	Differentiate between Thermoplastics and Thermosettings.	3	1,3	2	1.2.1
	(d)	Enlisting various applications, discuss any two methods of synthesis of nano material.	7	1,3	2	1.2.1
		OR				
	(e)	Taking suitable example, explain Addition and condensation polymerization.	7	1,3	2	1.2.1
Q5	(a)	Find out the number of fundamental vibrations for C_6H_6, H_2S, C_2H_2 and N_2O.	2	1,4	2	1.1.1
	(b)	Discuss fundamental principles involved in chromatographic separation.	2	1,4	2	1.2.1
	(c)	Discuss various electronic transitions involved in UV-visible region.	3	1,4	2	1.2.1
	(d)	Calculate the approximate stretching frequency and wave no of C–H single bond. Force constant $=5.0\times10^5$ gm sec^{-2}	7	1,4	3	1.1.1
		OR				
	(e)	Discuss Atomic Absorption Spectroscopy under following heads: (i) Principle involved (ii) Schematic diagram of apparatus (iii) Applications	7	1,4	2	1.2.1


Bloom's level wise marks distribution
Level 1
Level 2
Level 3
20%
60%
56%

ONLINE FEB 2022 EXAMINATION
Exam Code-2236
Subject Code- CH10506 (CHEMISTRY)

Time: 90 Minutes **MM: 40**

Note: All Questions are compulsory.

S. No.		Questions	Marks	CO	BL	PI
Q.1	A	Using MO diagram explain which is more stable: O_2^+ or O_2?	4	1	1,2	1.5.1
	B	i. Draw Newman and Sawhorse projection formulae for 1,2,3,4- tetra bromobutane **OR** 1,2- di bromo 1-chloro ethane. ii. Draw the structure of 2(E), 4(Z), 6(E)-Octatriene.	2+2	1	1,2	1.5.1
Q.2	A	Calculate the amount of lime(92% pure) and soda (98% pure) required for treatment of 30,000 litres of water, whose analysis is as follows: $Ca(HCO_3)_2$=40.5ppm, $Mg(HCO_3)_2$=36.55ppm, $MgSO_4$=30.0ppm, $CaSO_4$=34.0ppm, $CaCl_2$=27.75ppm, NaCl=10.0ppm	4	2	2,3	1.2.1
	B	Giving reaction of each, explain the function of the following in water treatment (a) Bleaching powder (b) Calgon (c) Sodium aluminate (d) Chloramine	4	2,5	1,2	1.5.1
Q.3	A	Explain, how Corrosion can be minimised by using the following techniques? (a) Using inhibitors (b) by design and material selection.	4	3	1	1.5.1
	B	Calculate the viscosity-index of oil when it has the Saybolt universal viscosity of 86 seconds at 210 °F and of 600 seconds at 100 °F. The high viscosity-index standard Pennsylvanian oil has Saybolt universal viscosity of 86 seconds at 98.9 °F and 400 seconds at 100 °F. The low viscosity-index standard gulf oil has a Saybolt universal viscosity of 86 seconds at 210 °F and 800 seconds at 100 °F.	4	3	3,4	1.2.1
Q.4	A	Giving suitable examples of each, explain Addition and Condensation methods of polymerization.	4	3	1,2	1.5.1
	B	Explain the bottom up and top down approaches for syntheses of nanomaterials. Enlist advantages and disadvantages of each method.	4	3	2,3	1.5.1
Q.5	A	Enlist types of fundamental vibrations that a molecule exhibit. Find out the number of fundamental vibrations for Chloroform and Methanol.	2+2	4	1,2	1.2.1
	B	Draw the schematic diagram of a GLC apparatus. Discuss the principle of column chromatography and suggest how will you separate a compound from a given mixture?	2+2	4	1,4	1.5.1

Bllom's Taxonomy Chart