## **II-TERM EXAMINATION: 2024-25**

## CLASS - XII (CBSE)

Time: 3 hrs.

CHEMISTRY [THEORY]

M.M.: 70

General iii) iii) iii) iv) v) vi) vii) viii)										
T	he follo	owing questions question carrie	are multi s 1 mark. '	SECTION Ple-choice There is r	e que	stions	s with one cor choice in this	rrect answer. section.	Each	
Q.1.	The s	lope in the plot o	of $log \left[ \frac{R_0}{R} \right]$	Vs time	t for	a first	t order reaction	on is :	[1]	
	(a)	$+\frac{K}{2.303}$	(b)	+K		(c)	$-\frac{K}{2.303}$	(d)		
Q.2.	Cons	ider the followin	g reaction						[1]	
		CHO	Anthori							
		O + NaOH	^							
		(O) + NaOH	$\xrightarrow{\Delta}$ A +	В						
	Idon	~					ruc introbed	i to eliment		
		tify A and B. $A = Phenol B =$	Sodium	Renzoate			4 - 1200			
	(a) (b)	A = Benzyl alc			enzoa	te	a sinday			
	(c)	A = Sodium Pl						Table State		
Q.3.	(d) A = Benzyl alcohol B = Benzoic acid  Auto oxidation of chloroform in air and sunlight produces a poisonous gas known as: [1]									
Q.J.	(a)									
		Mustard gas								
	(d)	Phosgene gas						A STORY		
	(c)	Chlorine gas	d or gare. Jenus as all							
0.4	(d)	enmund reduction	n is used	for the pr	epara	tion o	of Aldehyde t	he catalyst u	sed	
Q.4.		is reaction is:	It is asea.	or die pr	-Puru				[1]	
					(b)	Anl	hydrous AlCl	A Sector		
	(a) (c)	Pd-BaSO <sub>4</sub> Iron III oxide		VUG	(d)		SO <sub>4</sub>	3		
O.F			which is	most acid		-,6			[1]	
Q.5.	. 그 1 TO 1 : 이 전에 가면 열면 함께 에로 바로 바로 보다면 하게 되었다. 그 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1									
		OH 			TEN			Titl notes		
	(a)				(b)	CH	I <sub>3</sub> CH <sub>2</sub> OH			
	\ /	0								
		OH				0	H			
		OH				Ĭ	138 P.C. 251300	nor dear me		
		6			(4)	(0	)]			
	(c)	Y			(d)	Y	Transfer of the			
		NO <sub>2</sub>					CH <sub>3</sub>			
Q.6.	From	m the elements o	of 3d series	s given be	low v	which	is diamagnet	ic in Nature:		

(b)

(a)

		100 100 100				
				a colution t	will have the lowest freezing point.	[1]
Q.7.	Which	of the follow	ving 0.1 M aquec	ous solution v		
	(a)		ferro cyanide			
	(b)	Sodium chl				
	(c)	Magnesium	1 Chioride			F4.7
00	(d)	Glucose	icas reagent is fa	stest with:		[1]
Q.8.		eaction of Lu	Las leageth is to	Brest was		
	(a)	(CH <sub>3</sub> ) <sub>3</sub> COH	H OH			
	(b)	CH, CH, CH	UP OLI			
	(c)	(CH <sub>3</sub> ) <sub>2</sub> CH (	H		t la lacio titi	h
00	(a)	ophilic addi	ition of Grignar	d reagent to	ketones followed by hydrolysis wit	[1]
Q.9.	dilute	e acids forms	tion of Grigital			[1]
	(a)	Alkene				
	(b)	Primary ale	cohol			
	(c)	Tertiary ald	cohol			
	(4)	Secondary	alcohol			[1]
010	Solub	ility of gas i	n liquid decreas	ses with incr	ease in :	[-]
Q.10.	(a)	Pressure		(b)		
	(a) (c)	Both a and	b	(d)	None of the above	
				18 - 12-14-14		[1]
0.11.	CH <sub>3</sub> -C	CH2-C≡ CH	$+H_2O \xrightarrow{II_2^+}$			
	, ,	CIT CIT C	$+H_2O \xrightarrow{Hg^{**}} H$	(b)	CH, - CH, - C - CH,	
	(a)	CH <sub>3</sub> CH <sub>2</sub> C	112011	(5)	CH <sub>3</sub> -CH <sub>2</sub> -C-CH <sub>3</sub>	
					Charles I and Company in Annual Company	
		CH CH	CH C-H	(d)	CH <sub>3</sub> - CH <sub>2</sub> - CH <sub>2</sub> - C - OH	
	(c)	$CH_3 - CH_2$	CH <sub>2</sub> -C-H	(-)		
					0	[1
- 40	TT . C	la of th	o complex hexa	agua chrom	nium (III) chloride is : ICr (H.O).] Cl	[1
Q.12.		ormula of the	1Cl	(b)	[Cr (H <sub>2</sub> O) <sub>6</sub> ] Cl <sub>2</sub> [Cr (H <sub>2</sub> O) <sub>6</sub> Cl]	
	(a)	[Cr (H <sub>2</sub> O) <sub>6</sub> ]		(d)	[Cr (H,O), Cl]	
	(c)	[Cr (H <sub>2</sub> O) <sub>6</sub> ]	mber 13 to 16.			anatio
		Deth Asset	rtion (A) and Re	eason (R) tru	e but Reason (R) is the correct expl	anauo
		Don Asser	ertion (A).		교육이 나타하는 사람들이 되어가 없다고?	
	(A)	of the Acce	CI (101. ().			act
		of the Asse	rtion (A) and Re	eason (R) are	true but Reason (R) is not the corre	ect
	(A) (B)	of the Asser	of Accertion	All	true but Reason (R) is not the corre	ect
	(B)	of the Asser	on of Assertion (	Reason (R) is	s false.	ect
	(B) (C)	of the Asser	(A) is true, but	Reason (R) is Reason (R) is	s false. s true.	
0.12	(B) (C) (D)	of the Asser Both Asser explanation Assertion	(A) is true, but (A) is false but	Reason (R) is Reason (R) is	s false. s true.	ı
Q.13.	(B) (C) (D) Asser	of the Asse Both Asser explanation Assertion Assertion rtion (A):	(A) is true, but (A) is false but P-nitrophenol Nitro group is	Reason (R) is Reason (R) is is less acidic electron with	s false. s true.	ı
Q.13.	(B) (C) (D) Asser	of the Asser Both Asser explanation Assertion Assertion rtion (A):	(A) is true, but (A) is false but P-nitrophenol Nitro group is	Reason (R) is Reason (R) is is less acidic electron with	s false. s true. : than phenol. :hdrawing and helps in the stablisa	tion o
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Q.19.	(a)	Out of chlorobenzene and benzyl chloride which one easily hydrolyse by aqueous NaOH and why?	[2]
	(I-)	Arrange the following in increasing order of their reactivity for nucleophilic	[-]
	(b)	addition reaction.	
		HCHO, CH <sub>3</sub> CHO, CH <sub>3</sub> -C-CH <sub>3</sub> , CH <sub>3</sub> -C-CH <sub>2</sub> -CH <sub>3</sub>	
		Heno, engeno, eng c eng , eng	
		ÖÖÖÖ	
Q.20.	(a)	How will you convert the following:	[2]
		(i) Toluene from chlorobenzene	
		(ii) 3-hydroxybutanal from ethanol	
		OR	;
	(b)	Write major product of each reaction:	
		(i) $CH_3 - CH_2 - CH = CH_2 + HBr \xrightarrow{Peroxide}$	
		(ii) $C_6H_5ONa + C_2H_5Br \longrightarrow$	
Q.21.	Pheno	ol react with dil HNO3 at low temperature the product are separated into two	ide.
7	beake	r. Their boiling point is as follows:	[2]
		Beaker B.P	
		1 489 K	
		2 387 K	
	Predit	the compound present in beaker 1 and 2 why they have different boiling point	nt.
45		SECTION-C	
This s	ection	contains 7 questions with internal choice in one question. The following	
quest	ions ar	e short answer tupe and carry 3 marks each.	
Q.22.		Explain why [Fe(H <sub>2</sub> O) <sub>6</sub> ] <sup>3+</sup> has magnate moment value of 5.92 BM whereas	
255	(-)	[Fe(CN) <sub>4</sub> ] <sup>3-</sup> has a value of 1.73 BM.	[3]
	(b)	Write the hybridisation and magnetic character of $[Co(C_2O_4)_3]^3$ .	
	(c)	What is chelating ligand? Give an example.	
O.23.	The ra	ate constant of a reaction at 227 °C and 427 °C are 0.02 s <sup>-1</sup> and 0.07 s <sup>-1</sup> respective	ely
2.20	calcul	ate Activation energy and half life at 227°C (R = 8.314 JK <sup>-1</sup> mol <sup>-1</sup> )	[3]
0.24.	Write	chemical equations for the following reaction (Do any three)	[3]
	(a)	Williamson synthesis	
	(b)	Finkelstein Reaction	
	(c)	Sand mayer's reaction	
	(d)	Dow's process	
Q.25.		Give a chemical test to distinguish between the following pairs of	
Q.20.	()	compounds:	[3]
		(i) Propanone and propanal	
		(ii) Ethanal and ethanoic acid	
	(b)	Phenol is less acidic than carboxylic acid why?	
0.26	Give	chemical equation for the following:	[3]
2.20.	(i)	Phenol react with bromine water.	
	(ii)	Sodium ehthanoate is heated with soda lime.	
	(iii)	Methanal is heated with conc. NaOH.	
Q.27		Write IUPAC name of these compound:	[3]
		$NO_2$	
		(i) (o)	
		CHO CHO CHOUNCH	
		(ii) $CH_3-CH=C(CH_3)CH_2-CH(OH)CH_3$	
	b)	Give reason: (i) Grignard reagent is stored in dry conditions.	
		11 to a large balling point then compound in	2
		(ii) Aldehydes and ketones have lower boiling point than corresponding	,

(a) Convert acetic acid to acetone. Give chemical equation of (b) Distinguish between acetone and acetaldehyde with one good chemical test.  (c) Do the following conversions:  (i) Acetophenone to ethyl benzene  (ii) Cyclohexanone to cyclohexanone oxime  OR  Write chemical equation for the following:  (i) Wolff kishner reduction  (ii) Aldol condensation  Q.30. The nature of bonding, structure of the coordination compound can be explained to some extent by valence bond theory. The central metal atom/ion makes available a number of vacant orbitals equal to its coordiantion number. The appropriate atomic orbitals (s, p and d) of the metal hybridise to give a set of equivalent orbitals of definite geometry such as square planer tetrahed: al, octahedral and so on. A strong covalent bond is formed only when the orbitals overlap to the maximum extent. The d orbitals involved in the hybridisation may be either inner d orbitals ie. (n-1) d or outer d orbitals ie nd. The complexes formed are called inner orbital complex (low spin complex) and outer orbital complex (high spin complex) respectively. Further the complexes can be paramagnetic or diamagnetic in nature. The draw backs of this theory are that this involves number of assumptions and also does not explain the colour of the complex. Answer the following questions:  (a) Predict state of hybridisation and magnetic moment of [COF <sub>6</sub> ] <sup>1-1</sup> (b) Write IUPAC name of [Co (en) <sub>2</sub> Cl Br]  (c) Using valence bond theory find shape and hybridisation of [Ni (NH <sub>2</sub> ) <sub>6</sub> ] <sup>2+1</sup> (At no of Ni = 28)  OR  Find coordination number and oxidation number of cr in [Cr (OX) <sub>2</sub> Cl <sub>2</sub> ] <sup>3-1</sup> SECTION-E  The following questions are long answer type and carry 5 marks each. All questions have an internal choice.  Q.31. Attempt any five from the following:  (ii) Zn, Cd, Hg has low heat of atomisation why?  Transition metals forms coloured ions why?  Transition metals forms complexes why?			2000 Learning tion Calculate the time for	
The following questions are case-based questions Read the passage carefully and answer the questions that follow.  Q.29. Ketone play a prominent role in organic chemistry. The ketone moiety is extremely common in natural product and pharmaceuticals and in dyes, fragrondes and flavours of is also a versatile reaction centre in organic synthesis. Many frequently used reaction including Wolf-kischner reduction, Mannich reaction Wittig reaction and grignard reaction describe a wide array of transformations of ketone. The development of a practical route to ketone from feed stock chemicals has long been a subject of interest. Carboxylic acid and organohalides are bench -stable feedstock chemicals commonly used in organic synthesis. When producing ketone from carboxylic acid and organohalides, the stoichiometric approach requires preparation of necessary intermediates such as amides or aldehydes and grignard reagents.  **Answer the following questions:**  (a) Convert acetic acid to acetone. Give chemical equation only.  (b) Distinguish between acetone and acetaldehyde with one good chemical test.  (c) Do the following conversions:  (i) Acetophenone to ethyl benzene  (ii) Cyclohexanone to cyclohexanone oxime  OR  Write chemical equation for the following:  (i) Wolff kishner reduction  (ii) Aldol condensation  Q.30. The nature of bonding, structure of the coordination compound can be explained to some extent by valence bond theory. The central metal atom/ion makes available a number of vacant orbitals equal to its coordination number. The appropriate atomic orbitals (s, p and d) of the metal hybridise to give a set of equivalent orbitals of definite geometry such as square planer tetrahed-il, octahedral and so on. A strong covalent bond is formed only when the orbitals overlap to the maximum extent. The d orbitals involved in the hybridisation may be either inner d orbitals ic. (n-1) dor outer d orbitals involved in the hybridisation may be either inner d orbital complex (low spin complex) and outer orbital complex (hi	Q.28.	A first 80% d	ecomposition ( $\log 7 = 0.043$ , $\log 2 = 0.007$ ).	[3]
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(b) Write IUPAC name of [Co (Ch) <sub>2</sub> and [Co (C		(a)		[1]
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(ii) Transition metals forms coloured ions why?  Transition metal forms complexes why?	Q.31		7n Cd Ho has low fleat of atomisation wity.	
Transition metal forms complexes why?			Transition metals forms coloured ions why?	
(III) Halling Cold		The second second second	Transition metal forms complexes why?	19
(iv) La (OH) <sub>3</sub> is more basic than Lu (OH) <sub>3</sub> .			La (OH) <sub>3</sub> is more basic than Lu (OH) <sub>3</sub> .	

	(v) (vi)		KMnO <sub>4</sub> and K <sub>2</sub> MnO <sub>4</sub> which one is paramagnetic and why? geometrical isomers of [Co (en) <sub>2</sub> $C\ell_2$ ] <sup>+</sup> .				
	(vii)		o transition elements show variable oxidation state?				
Q.32.		X 2	Give reason:	[3]			
Q.02.	(4)	17	(1) formic acid is more acidic than acetic acid why?				
a a - 1			(2) Presence of NO <sub>2</sub> group at ortho and para position in aryl hal increases its reactivity for nucleophilic substitution.	ide			
			(3) Alcohols are soluble in water why?	101			
			Give equation for following:	[2]			
		` '	(1) Ethanoic acid is heated with ethanol in presence of ions sulphuri	c acid.			
			(2) Phenol react with acetylchloride in presence of pyridine.				
			OR	in a time			
	(b)	An organic compound A having molecular formula C <sub>3</sub> H <sub>6</sub> O gives lodoform reaction and forms a compound B. B on heating with Ag powder give compound C. C reacts with dil H <sub>2</sub> SO <sub>4</sub> and HgSO <sub>4</sub> to obtain D. D undergoes Aldol condensation to form E. Identify B, C, D, E and write the balanced chemical euqtions for the involved name reactions.					
Q.33.	(a)	(i)	Define Pseudo unimolecular reaction with example.	[1]			
	(-)	(ii)	What is effect of catalyst on activation energy of reaction.	[1]			
			log R \( \sum_{\text{time}} \) Consider the following:	[3]			
			(a) What is the order of Reaction				
			(b) What is value of slope				
			(c) What is unit of rate constant				
	* 100		OR STATE OR STATE OF THE OR ST				
	(b)	(i)	Define ideal solution.	[1]			
	(0)	(ii)	Why are aquatic species more comfortable in cold water in compar	rison			
		()	to warm water.	[1]			
		(iii)	Calculate mass of CaCl, (molar mass = 111) to be dissolved in 500	gm of			
		()	water to lower its freezing point by 2k assuming that CaCl <sub>2</sub> underg	goes			
			complete dissociation (K, for water = 1.86 K kg mol <sup>-1</sup> )	[3]			

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