Class – XII
Chemistry

Time:3hrs   *MM:70*

General instructions:

All questions are compulsory.

Marks for each question are indicated against it.

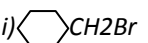*Questions number 1to 8 are very short –answer questions, carrying 1 mark each. Answer these in one word or about one sentence each.*
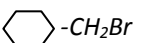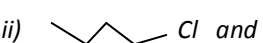
Questions number 9 to18 are short –answer questions, carrying 2 marks each. Answer these in about 30 words each.

Questions number19 to27 are short –answer questions, carrying 3 marks each. Answer these in about 40 words each.

Questions number28 to30 are long-answer questions of 5 marks each. Answer these in about 70 words each.

7 Use log tables, if necessary. Use of calculators is not permitted
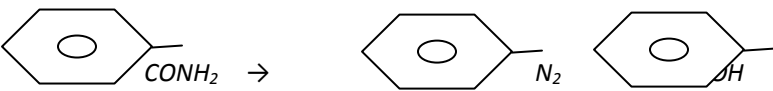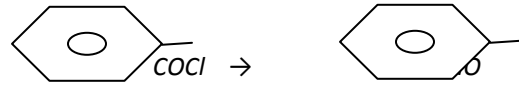
Q1	What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 2/3rd of octahedral voids ?	1
Q2	Define the term overvoltage.	1
Q3	What is the role of dilute NaCN in the extraction of gold ?	1
Q4	Draw the structure of $XeOF_4$.	1

Q5	Give the I.U.P.A.C.name of the following compound.
	
	CH_3——$C=CH$——CH_2-COOH
	            |
	          Br
		1

Q6	Write the structural formula of 3-methyl-2-oxo pentanal.	1
Q7	Arrange the following compounds in increasing order of basic strength in gas phase.	1

	$NH_3, C_6H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N, C_2H_5NH_2$	
Q8	Write the monomers used for getting the following polymer . a) Teflon b) Nylon-6,6	1
Q9	A first order reaction is $3/4^{th}$ completed in 75 minutes. Calculate its $t_{1/2}$.	2
Q10	(i) Write the unit of rate constant for second order reaction. (ii) Explain the role of depressant in the froth floatation method.	2
Q11	i)Draw the structure of BrF_3 molecule. ii)Write the reaction between XeF_4 and O_2F_2 .	2
Q12	i)What happens when P_4 is treated with SO_2Cl_2 ii)How is O_3 estimated quantitatively?	2
Q13	i)Discuss about deviation shows by mixing ethanol and water. ii)Define the term ebullioscopic constant.	2
Q14	Which one in the following pairs of substances undergoes S_N2 substitution reaction faster and why? i) ⬡CH2Br and ⬡-CH_2Br ii) ⌇Cl and I⌇	2
Q15	Complete the following reactions: i) $CH_3CH=C(CH_3)_2$ + HBr peroxide ? → ii)$CH_3CH_2CH_2Cl$ + NaI acetone and heat →	2
Q16	Explain the following : a)Isoelectric point. b) Two strands of DNA are not identical but complimentary to each other. Explain this statement.	2

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Q17	*What do you mean by essential and non essential amino acid give one example of each?*	2
Q18	*What is a biodegradable polymer?Write the monomer of Nylon 6 and Bakelite.*	2
Q19	*If the radius of Copper atom is 127.8 pm and density of copper metal is 8.95 g/cm^3, is the copper unit cell a face centred cubic ,a body centred or simple cubic structure.(Given :At.mass of Cu=63.5,N_A=6.022x10^{23})*	3
Q20	*Determine the amount of K_2SO_4 dissolved in 3.5 liter of water such that its osmotic pressure is 0.80 atm at 27°C,assuming that it is completely dissociated.(Given:At.mass of K=39 u,S=32 u,O=16)*	3
Q21	*Two reactions of the same order have equal pre exponential factors but their activation energies differ by 24.9 kJ/ mol. Calculate the ratio between the rate constants of these reactions at 27°C. (Gas constant R = 8.314 J K^{-1} mol^{-1})*	3
Q22	*Ramesh went to Cinema theatre when it was raining heavily in a car* *and met with an accident due to unbalanced driving with hindered* *beam of light.* *a) Define Tyndall effect.* *b) Ramesh met with an accident. Give Scientific reason?* *c) Mention the value associated with the above situation.*	3
Q23	*Arrange the following in the order of property indicated against each set:* *(i) F2, Cl2, Br2, I2 (increasing bond dissociation enthalpy)* *(ii) H2O, H2S, H2Se, H2Te (increasing acidic character)* *iii)HCl,HBr,HI,HF (increasing reducing character)* *Or*	3

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	i)What happen when XeF_4 react with water. ii) Noble gas species which is isostructural with ClO^{-1} iii)Complete the following reaction $PCl_5 + D_2O \longrightarrow$	
Q24	A metal ion Mn+ having d4 valence electronic configuration combines with three bidentate ligands to form a complex compound. Assuming : Pairing energy $< \Delta_0$ (i) Write the electronic configuration of d4 ion. (ii) What type of hybridisation will Mn+ ion has? (iii) Name the type of isomerism exhibited by this complex. or Show the octahedral splitting of octahedral complex.How the pairing energy related with Δ_0 .	3
Q25	i)Explain the mechanism of acid catalysed hydration of ethenel forming ethanol. ii)Convert methanal to propanol by using Grignard's reagent. iii)Write the reaction between phenol and Br_2 (aq).	3
Q26	Giving an example for each describe the following reaction. i)clemensen reduction ii)Etard oxidation iii)Cross Aldol condensation	3
Q27	i)Write the difference between antiseptic and disinfectants with one example in each. ii)What is non ionic detergent.	3
Q28	i) Transition metal compounds generally act as catalyst .(give reason)	5

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b) ii) Discuss the lanthanoid contraction .

iii) $E^0 Mn^{3+}/Mn^{2+}$ has higer positive value than $E^0 Cr^{3+}/Cr^{2+}$ (Atomic number Cr=24,Mn=25)

iv)What is the effect of change in Ph on chromate solution?

V)Why do the transition elements form coloured compounds?Explain.

vi)Write the reaction between $KMnO_4$ and oxalic acid in acidic medium.

Or

Account for the following : (i) Out of the ions Co^{2+}, Sc^{3+} and Cr^{3+} which one would

give coloured aqueous solutions and why ?

(ii) Explain why chromium is a typical hard metal while mercury is a liquid.

(iii) Why in permanganate ion, there is a covalency between manganese and oxygen ? (iV)Why do the transition elements form interstitial compound?

(v) Complete the given reaction :

$$Cr_2O_7^{2-} + H^+ + H_2C_2O_4 \rightarrow \quad \dots\dots\dots\dots$$

Q29	i)Write the anode and cathode reaction of lead storage battery.	5
	ii)Define the molar conductivity .	
	iii)Calculate the equilibrium constant for the reaction	
	$2Cr(s) + 3Cd^{+2} \rightarrow 2Cr^{+3}(s) + 3Cd$	
	[$E^0 Cr^{3+}/Cr = -0.74 V$ and $E^0 Cd^{2+}/Cd = +0.40V$]	
	Or	
	(i) State Kohlrausch's law.	
	(b) Write down the reactions involved in the charging of a lead storage battery.	
	(c) A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using a current of 1.5.0	

amperes for 15 minutes. What mass of Ni is deposited at the cathode.

[At. Wt. Ni = 58.7]

Q30	*Complete the following reaction.*	5

i)

$CONH_2$ → ......N_2 ......OH

ii)

$COCl$ → ......O

iii)Distinguish between the following by suitable chemical test

a)Phenol and aspirin.

b)Benzaldehyde and aniline

Or

i)An organic compound with the molecular formula $C_{10}H_{13}O$ forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction .On vigorous oxidation it gives benzene-1,2,3-tricarboxylic acid.Identify the organic compound.

ii)Arrange the following acid in increasing order of acidity:

$CH_3CH_2CH(Br)COOH,CH_3CHBrCH_2COOH,(CH_3)_2CHCOOH,CH_3CH_2CH_2COOH$

 III)Convert bezaldehyde cinnamic acid.

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