CODE: SET 1 **KENDRIYA VIDYALAYA SANGATHAN GUWAHATI REGION** **TOTAL PAGES: 3**

HALF YEARLY EXAMINATION 2018-19

CLASS: XII **TIME: 3 HRS**

SUBJECT: CHEMISTRY **MM: 70**

General Instructions:

1. All questions are compulsory.
2. Marks for each question are indicated against it.
3. Question numbers 1 to 5 are very short answer question and carries 1 mark each.
4. Question numbers 6 to 12 are short answer question and carries 2 mark each.
5. Question numbers 13 to 24 are also short answer question and carries 3mark each.
6. Question numbers 25 to 27 are long answer question and carries 5 mark each.
7. Use log tables, if necessary. Use of calculators is not allowed.

Q.1	Which Point defect decreases the density of a crystal?	1M
Q.2	Why ionic solids conduct in molten phase?	1M
Q.3	Which will adsorb more gas, a lump of charcoal or powdered charcoal. Why?	1M
Q.4	What is the expected Van't Hoff factor for $K_4[Fe(CN)_6]$ when it completely dissociates in water?	1M
Q.5	Write the IUPAC name of $[Cr(NH_3)_4Cl_2]^+$	1M
Q.6	Complete the following chemical reaction equations **(i)** XeF_2+H_2O **(ii)** PCl_5+H_2O	2M
Q.7	Differentiate between S_N1 and S_N2 reaction mechanism.	2M
Q.8	Write all the steps involved in the extraction of Cu from Copper pyrites	2M
Q.9	Complete the following chemical equation- **(i)** $MnO_4^- + Fe^{2+} + H^+$ **(ii)** $Cr_2O_7^{2-} + Sn^{2+} + H^+$	2M
Q.10	i) State Henry's law for solubility of a gas in a liquid. ii) At the same temperature hydrogen is more soluble in water than helium, which of them is having a higher value of KH and why?	2M
Q.11	Arrange the Following in increasing order against the properties mentioned :- i. HOClO2 , HOClO , HOCl ,HOClO3 (acidic strength) ii. H—I , H—F, H—Br,H—Cl (Bond Dissociation Enthalpy)	2M
Q.12	[Ni(CO)4] has tetrahedral geometry while [Ni (CN)4]2- is square planar. Explain.	2M
Q.13	Calculate the standard electrode potential of Ni^{2+}/Ni electrode if emf of the cell $Ni(s) \mid Ni^{2+}_{(0.01\ m)} \parallel Cu^{2+}$ (0.1M) $\mid$ Cu(s) is 0.59 V Given $E^o\ Cu^{2+}/Cu$ = +0.34 Volt. OR Calculate the cell emf for the following at 25°C $Zn(s) \mid Zn^{2+}(0.1M) \parallel Cd^{2+}$ (0.01M) $\mid$ Cd(s) Given E^oZn^{2+}/Zn= -0.763 V, $E^o\ Cd^{2+}/Cd$= -0.45 V 1F=96500 C mol^{-1}, R=8.314 $JK^{-1}\ Mol^{-1}$	3M
Q.14	What happens when a) A colloidal solution of $Fe(OH)_3$ and As_2S_3 are mixed. b) A beam of light is passed through a colloidal solution. c) Continuous dialysis of a colloidal solution takes place. **OR** a) An electric current is passed through a colloidal solution. b) Alum is applied to a freshly bleeding wound. c) River water meets sea water.	3M

Q.15	Describe the role of following: i) NaCN in froth floatation process. ii) CO in Mond's process. iii) Cryolite in the metallurgy of aluminium	3M
Q.16	a) Differentiate between amorphous and crystalline solids. b) If X occupies ½ tetrahedral voids and Y occupies 2/3 of the octahedral voids. What is the formula of compound.	3M
Q.17	A) Account for following: i) Of the d^4 species,Cr(II) is strongly reducing while Mn(III) is strongly oxidising. ii) Transition metals and their many compounds form coloured compounds. B) What is Lanthanoid contraction?	3M
Q.18	a) Out of 1M urea and 1M KCl which will have a maximum freezing point and why? **b)** Calculate the freezing point of a solution containing 18 g glucose $C_6H_{12}O_6$ and 68.4 g sucrose $C_{12}H_{22}0_{11}$ in 200g of water the freezing point of pure water is 273 K and K_f for water is 1.86 K Kg mol^{-1}	3M
Q.19	Find the type of lattice and radius of an atom, for a cube having edge length of 400 pm, atomic wt. = 60 and density = 6.23 g/cc.	3M
Q.20	Explain- a. Peptization b. Hardy Schulze Rule c. Electrokinetic potential	3M
Q.21	Define with reaction a) Sandmeyer reaction b) Finkelstein reaction c) Wurtz-Fittig reaction	3M
Q.22	The rate constant of a first order reaction becomes 5 times when the temperature is raised from 350 K to 400 K. Calculate the activation energy of the reaction. Draw the graph representing the effect of catalyst on rate of a reaction.	3M
Q.23	Based on valence bond theory explain the geometry and give the magnetic nature of the given complex: $[Co(CN)_6]^{3-}$	3M
Q.24	Explain – a. KCN gives alkyl cyanide whereas AgCN gives alkyl isocyanide on reaction with alkyl halide. b. Alkyl chlorides gives alcohols on reaction with aqueous KOH but form alkenes in presence of alc. KOH . c. Grignard reagents should be prepared under anhydrous conditions.	3M
Q.25	a) For the reaction A + B → C, it is found that doubling the concentration of A increases the rate by 4 times, and doubling the concentration of B doubles the reaction rate. What is the overall order of the reaction? b) In a certain first order reaction, half the reaction was decomposed in 500 seconds. How long will it take for 90% completion? c) Define rate constant. **OR** a) The half life for a first order reaction is 5×10^4s. What percentage of the initial reactant will react in 2 hours. b) Write the equation for collision theory. c) The half life of radioactive decay of C-14 is 5730 years . An archeological artefact containing wood had only 80% of the C-14 found in living tree .Estimate the age of the sample .	5M
Q.26	**(a)** Draw the structure of (i) $XeOF_2$ (ii) $HClO_4$ **(b)** How would you account for the following : **(i)** NH_3 is a stronger base than PH_3	5M

	(ii) Sulphur has a greater tendency for catenation than oxygen. **(iii)** F_2 is a stronger oxidising agent than Cl_2 **OR** **(a)** Draw the structure of oleum and pyrophosphoric acid. **(b)** Arrange the following in the increasing order of property indicated. **(i)** H-F ,H-Cl ,H-Br ,H-I **(**Acidic nature) **(ii)** NH_3, PH_3 ,AsH_3 ,SbH_3 ,BiH_3 **(**Basic nature) **(iii)** H_2O ,H_2S ,H_2Se ,H_2Te ,H_2Po **(**Boiling point)	
Q.27	**a)** What is fuel cell? Give balanced equations of the occurring reactions. b) How many Coloumbs are required for oxidation of 1 mole of FeO to Fe_2O_3? c) Predict the products of electrolysis obtained at the electrodes in each case when the electrodes used are platinum. (a) An aqueous solution of $AgNO_3$ (b) A dilute aqueous solution of H_2SO_4 **OR** a) At infinite dilution the molar conductance of Na^+ and SO_4^{2-} ions are 50 and 160 S cm^2 mol^{-1} respectively. What will be the molar conductance of sodium sulphate at infinite dilution? b) What is the function of salt bridge?	5M