

# EQUILIBRIUM CLASSES BY ANUJ SIR

## SAMPLE –PAPER 2015

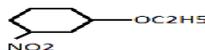
TIME -3 HR.

CBSE- CHEMISTRY

M.M-70

- All questions are compulsory.
- Question Nos. 1 to 5 are very short answer questions and carry 1 mark each.
- Question Nos. 6 to 10 are short answer questions and carry 2 mark each.
- Question Nos. 11 to 22 are short answer questions and carry 3 mark each.
- Question Nos. 23 carry 4 mark each
- Question Nos. 24 to 26 are long answer questions and carry 5 mark each.
- Use log tables if necessary, use of calculators is not allowed.

Q.1 Write IUPAC name of  $[\text{Co}(\text{CN})\text{H}_2\text{O}(\text{en})_2]^{2+}$  and



Q.2 What is the effect of pressure on Crystal solid

Q.3 Draw the structure of  $\text{XeO}_2\text{F}_2$  and  $\text{XeO}_3$

Q.4 What type of isomerism occurs in  $[\text{CoCl}_2(\text{en})_2]^+$

Q.5 What is Henry's Law ? Or What is occlusion?

Q.6 why  $\text{CaCl}_2$  is used to remove snow from roads in hilly area ?

Q.7 What is meant by hcp and ccp?

Q.8 What is the relation b/w  $r$  and  $R$  of tetrahedral and octahedral voids ?

Q.9 What is shape selective catalysis Explain with ZSM-5

Q.10 (a) What is collision theory frequency ?

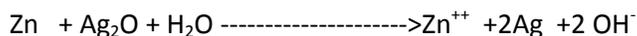
(b) Deduce the shape of  $(\text{HPO}_3)_3$

Q.11 Write short notes

(i) Hardy Schulze Rule

(ii) Peptization

Q.12 (a) Determine the Standard Gibbs free energy and  $E^0$  for the reaction



Given that  $E^0 \text{Ag}^+/\text{Ag} = 0.34 \text{ V}$ ,  $E^0 \text{Zn}^{++}/\text{Zn} = -0.76 \text{ V}$ ,

(b) Two elements A and B forms compound  $\text{AB}_2$  and  $\text{AB}_4$ . When dissolved in 20g of Benzene ( $\text{C}_6\text{H}_6$ ), 1g of  $\text{AB}_2$  lowers the freezing point by 2.3K where as 1.0g of  $\text{AB}_4$  lowers it by 1.3K. The molar depression constant for benzene is  $5.1 \text{Kkg mol}^{-1}$ . Calculate atomic mass of A and B.

Q.13 Predict the product of electrolysis in each of following

- (i) An aqueous solution of  $\text{CuCl}_2$  with Pt electrodes
- (ii) An aqueous solution of  $\text{AgNO}_3$  with Pt electrodes

Q.14 Explain (a) Lanthanoid contraction and its cause

(b) Why  $\text{La}(\text{OH})_3$  is more basic than  $\text{Lu}(\text{OH})_3$

Q.15 Differentiate b/w the roasting and calcination.

Q.16 What is auto reduction and write the reactions occurring in Bessemer converter **OR**

Write chemical reactions occurring in the blast furnace and which reaction is endothermic

Q.17 Arrange the following according to the instruction

- (i)  $\text{F}_2, \text{I}_2, \text{Br}_2, \text{Cl}_2$  (Increasing order of bond enthalpy)
- (ii)  $\text{H}_2\text{S}, \text{H}_2\text{O}, \text{H}_2\text{Te}, \text{H}_2\text{Se}$  (Increasing order of acidic strength)
- (iii)  $\text{NH}_3, \text{PH}_3, \text{AsH}_3, \text{BiH}_3, \text{SbH}_3$  (Increasing order of basic character)

Q.18 Write the manufacture of

- (i)  $\text{K}_2\text{Cr}_2\text{O}_7$  from chromite ore
- (ii)  $\text{KMnO}_4$  by pyrolusite ore

Q.19 (a) Explain  $K_{a2}$  is much less than  $K_{a1}$  for  $\text{H}_2\text{SO}_4$

- (b) Write the mechanism of any two  
(i) Dehydration of alcohol into ether

(ii) Dehydration of alcohols into ethene

(iii) SN2 reaction

Q.20. Explain –

- (i)  $\text{FeF}_6$  is outer orbital complex and  $[\text{Fe}(\text{CN})_6]^{4-}$  is inner orbital complex  
(ii)  $[\text{NiCl}_4]^{2-}$  is tetrahedral and  $[\text{Ni}(\text{CN})_4]^{4-}$  is square planar.  
(iii)  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  is violet in colour

Q.21 Write short notes on

- (i) Gabriel phthalimide synthesis OR Gattermann's Koch reaction  
(ii) Cannizzaro's reaction OR Cross Aldol condensation  
(iii) Carbyl amine reaction OR Clemmensen's Reduction

OR

Distinguish b/w following pairs

Acetaldehyde and acetone

Phenol and Benzoic acid

Formaldehyde and Acetaldehyde

Q.22 Write monomers of

- (i) Natural rubber (ii) PHBV (iii) Buna S rubber (SBR)

OR

Draw the structure of (i)  $\alpha$ -D glucose (ii) Amylopectin (iii) Amylose

Q.23 Alok is 50 years old and has diabetes. He uses saccharine as sweetening

agent in tea and coffee and sugar free in sweets. Gauri too is diabetic. She controls her sugar level in diet by using less sugar and by exercising.

- Who is able to handle diabetes more efficiently and why? (2)
- What value do you derive from this? (1)
- What are the harmful effects of artificial sweeteners (1)

Q.24 (a) Complete the following chemical reactions equations:-

i)

Mn	t/s	0	30	60	90
$O_4^- (aq) + C_2O_4^{2-} (aq) + H^+ (aq) \rightarrow$	[Ester]/mol L <sup>-1</sup>	0.55	0.31	0.71	0.085

ii)  $Cr_2O_7^{2-} (aq) + Fe^{2+} (aq) + H^+ (aq) \rightarrow$

(b) In a pseudo first order hydrolysis of ester in water, the following results were obtained.

- Calculate the average rate of R<sup>n</sup> b/w the time interval 30 to 60 second.
- Calculate the pseudo first order rate constant for hydrolysis of ester. /OR

For a first order R<sup>n</sup>. Show that time required for 99% completion is twice the time required for completion of 90% of R<sup>n</sup>.

Q.25 (a) Silver forms CCP lattice and X- ray studies of its crystals show that the edge length of unit cell is 408.6 pm . calculate the density of crystal

(b) Why ZnO becomes yellow on heating ?

Q.26. .Carry out the following conversions

- But-1-ene in to But-2-ene
- Aniline in to acetanilide

(iii) Methyl Bromide in to 2- Methyl propan-2-ol

(iv) Toluene to Benzoic acid

(v) Formaldehyde into Uropropine.

OR

Explain –

(i) Aniline can not be prepared by Gabriel phalimide Synthesis

(ii) Carboxylic acids are more acidic than phenols

(iii) Tert alkyl halide can not be used in Williamson's synthesis to prepare tert alkyl ether

(iv) Chloroform in kept in air tight dark coloured bottles and ethanol in added.

(v) Alkyl halides on reaction with K.C.N to give cyanide while on reaction with AgCN to give Is cyanide.

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