CBSE Sample Paper – 2015
Class – XII
Subject - Chemistry

3HRS   MM:70

General instructions:

1) *All questions are compulsory.*
2) *Marks for each question are indicated against it.*
3) *Question number 1to 8 are very short –answer questions, carrying 1 mark each. Answer these in one word or about one sentence each.*
4) *Question number 9 to18 are short –answer questions, carrying 2 marks each. Answer these in about 30 words each.*
5) *Question number19 to27 are short –answer questions, carrying 3 marks each. Answer these in about 40 words each.*
6) *Question 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.	Give the IUPAC name of the following compound. $(CH_3)_3CCOC(CH_3)_2CHBr\, CH_3$	1
Q2	Draw the structures of the **1-Bromo-4-sec. butyl-2-methylbenzene** .	1
Q3.	What happens when Gluconic acid is treated with nitric acid?	1
Q4.	Define Zeta potential.	1
Q5	Define synergic bonding.	1
Q6.	Write the reaction of XeF_2 with PF_5.	1
Q7.	Write reaction between 1-methoxy propene with HI followed by dilute NaOH.	1
Q8.	Define Rate constant .	1
Q9.	Why molar conductivity increases and conductivity decreases sharply with increase in dilution for weak electrolyte?	2
Q10.	Explain the following terms with suitable examples: (i) Why amorphous solid are isotropic and crystalline solid are anisotropic in nature . (ii) What happens when Fe_3O_4 heated above 850K?	2
Q11.	An element with molar mass 2.7×10^{-2} kg mol^{-1} forms a cubic unit cell with edge length 405 pm. If its	2

density is $2.7 \times 10^3 \, kgm^{-3}$, Calculate the number of atoms and unit cells in 150 g of element?

Q12. a) What is the difference between molecularity and order of reaction?   2
b) Define temperature coefficient of a reaction.

Q13. Complete the following reaction: 2
i) $XeF_2 + H_2O$ →
ii) $Pt + HNO_{3(conc)} + HCl$ →

Q14. The decomposition of phosphine, PH_3, proceeds according to the following equation: 2
$4PH_3(g) \rightarrow P_4(g) + 6H_2(g)$
It is found that the reaction follows the following rate equation:
Rate = $k[PH_3]$ if initial pressure was 0.5 bar and total pressure at 200 sec was 1.5 bar at 100°C.
The half-life of PH_3 is 37.9 s at 120°C. calculate Ea_f.

Q15. i) Draw the structure of Cyclotrimetaphosphoric acid.   2
ii) Why Perchloric acid is stonger than sulphuric acid?

Q16. Draw all the isomers (geometrical and optical) of: (i) $[CoCl_2(en)_2]^+$,(ii) $[Co(NH_3)Cl(en)_2]^{2+}$ (iii)   2
$[Co(NH_3)_2Cl_2(en)]^+$
           Or
Giving a suitable example for each, explain the following:
(*i*) Tetrahedral Crystal field splitting of d subshell
(*ii*) Linkage isomerism
(*iii*) Ambidentate ligand.

Q17. i) NH_2 group of aniline acetylated is before carrying out nitration?   2
ii) Aniline does not undergo Friedel-Crafts reaction.

Q18. i) Write a short note on Hofmann's bromamide reaction.   2
ii) Write a short note on Carbyl amine reaction.

Q19. i) Write mechanism of hydration of ethene.   3
ii) Convert methaol to butan-1-ol.

Q20. A cell ,$Cu/Cu^{+2}(10^{-3} M) \| Cu^{+2} /Cu$ (0.1molar),:(Given $E°$ Cu^{+2}/Cu =0.34 v)   3
then calculate the following:
i) Concentration of Cu^{+2} if 1.5 v current is passed for 30 minutes.
ii) Calculate Kc=?
iii) E cel=?
           Or
Three electrolytic cells A,B,C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$,respectively are connected
in series. A steady current of 4.5 amperes was passed through them.Calculate the thickness of Ag ,Cu,Zn
plating if a metal plate of area 10 cm^2 is dipped in these cells.
        (At.mas Cu=63.5,Ag=108,Zn=65.39,d of Ag,Cu,Zn are 10.5,9.5,12.5 g/cm^3 respectively)

Q21. i) What happens when a colloidal sol of AgI is mixed with that of $AgNO_3$ sol?   3
ii) What is the difference between gel and sol?

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iii)Write the cause of peptization.

Q22. Describe the role of the following: 3
(*i*) NaCN in the extraction of Ag.
(*ii*) I_2 in the purification of Zirconium.
(iii)Hydrometallurgy in the extraction of aluminium?

Q23. i)Why fluorine does not show +ve oxidation state?   3
ii)What happens when PCl_5 react with heavy water?
iii)How can you detect presence of NO_3^-?

Q24. i)Define enantiomer .Calculate no. of optically active stereo isomers in 2,3 dichloro butane.   3
ii)Arrange the following in increasing order of reactivity towards SN^1:
 $(CH_3)_2CHI, CH_2=CHCH_2I, C_6H_5CH_2I$
iii)Prepare 1-Fluoro propane from 2-Chloropropane

Q25. i)What is tincture of iodine?What is its use?   3
ii)Write the composition of dettol soap.
iii)Write uses of equanil.

Q26. Pradeep had very high fever. He was given strong antibiotics. But after recovering from fever he was not   3
able to digest food and was feeling too weak.The grandmother who lived in his neighborhood suggested him
to take lots of milk, egg, fruits and vegetables.
a. Why?
b. What is the remedy for this?
c. What was the value that Pradeep had by taking fruits and vegetables?

Q27.   i)   Distinguish between the terms thermoplastic and thermosetting plastic and give an example of each.   3
       ii) Write the monomer of nylon 6.
       iii) Write the monomer of glyptal.

Q28. i)The actinoids exhibits more number of oxidation states in general than the lanthanoids.   5
ii)Write the cause and consequences of lanthanoid contraction.
iii) With same (d^4) configuration Cr (II) is reducing whereas Mn (III) is oxidising.
iv)How to prepare $K_2Cr_2O_7$ from chromite ore.
v)Why trend of melting point is minimum and oxidation number is maximum in middle of transition series.
                                                    Or
(*a*) Complete the following chemical equations:
(*i*) $Fe^{3+} + I^- + H^+$ →
(*ii*) $Cr_2O_7^{2-} + Sn^{+2} + H^+$ →
(i)Why Ce(iv) is more stable than Ce (II)?
iv) On the basis of data given below comment on the stability of Fe^{3+} in acid solution as compared to that of
Cr^{3+} or Mn^{3+}.
[Cr^{2+}/Cr =-0.9V, Cr^{3+}/Cr^{2+}= -0.4 V,Mn^{2+}/Mn= -1.2V ,Mn^{3+}/Mn^{2+} =+1.5V,Fe^{2+}/Fe= -0.4V ,
Fe^{3+}/Fe^{2+}= +0.8 V]

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v)Write the reaction of Mngnous ion with peroxydisulphuric acid .

Q29. i)Write the mechanism of esterification.   5

ii)Distinguish between methyl benzoate and isopropyl benzoate .

iii)An organic compound (A) with molecular formula $C6H_{12}$ when treated with O_3 ,zinc and water gives compound B &C boyh forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide,B reduces Tollens' or Fehlings' reagent but C does not reduces Tollens' or Fehlings' reagent ,B and C on treating with diluted alkali followed by heating gives D and E are isomer of each other decolourise bromine water or Baeyer's reagent, but only $D(C_6H_{10}O)$ can give iodoform test to give $(F)[C_5H_7O_2Na]$. Identify the compounds (A), (B) , (C),D,E and explain the reactions involved.

<div align="center">Or</div>

i) Arrange the following compounds in increasing order of their reactivity in nucleophilic addition reactions: Acetaldehyde,Acetone,Benzaldehyde, p-Tolualdehyde, p-Nitrobenzaldehyde,Acetophenone.

ii)Convert Benazaldehyde to cinnamic acid(3-phenyl prop-2 enoic acid.(in two step)

iii)Describe Cannizzaro reaction with example.

iv)Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol. Why?

v)Ethanal to 3-hydroxy butanoic acid.(in two step)

Q30. a)Define cryoscopic constant constant ,write its unit.   5

b)Define Henry law.Write one application.

c) 72.5 g of phenol is dissolved in 1 kg of a solvent (k_f = 14)which leads to dimerization of phenol and freezing point is lowered by 7 kelvin.What percent of total phenol is present in dimeric form?

<div align="center">Or</div>

a) What is meant by negative deviation from Raoult's law ?Draw diagram to illustrate the relationship between vapour pressure and mole fraction of carbon disulphide and acetone in a solution to represent negative or positive deviation ?

b)1.22 g of benzoic acid is dissolved in (i) 100 g acetone (K_b for acetone = 1.7) and (ii)100 g benzene (K_b for benzene = 2.6).The elevation in boiling points T_b is 0.17°C and 0.13°C respectively.

(a) What are the molecular weights of benzoic acid in both the solutions?

(b) What do you deduce out of it in terms of structure of benzoic acid?

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