DELHI PUBLIC SCHOOL, JAMMU
ASSIGNMENT PRE-BOARD-I
(2019-2020)

SUBJECT-CHEMISTRY CLASS-XII

General Instructions

(a) All questions are compulsory.

(b) Section A: Q.no. 1 to 20 are very short answer questions (objective type) and carry 1 mark each.
(c) Section B: Q.no. 21 to 27 are short answer questions and carry 2 marks each.
(d) Section C: Q.no. 28 to 34 are long answer questions and carry 3 marks each.
(e) Section D: Q.no. 35 to 37 are also long answer questions and carry 5 marks each.
(f) There is no overall choice. However an internal choice has been provided in two questions of two marks, two questions of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.
(g) Use log tables if necessary, use of calculators is not allowed.

SECTION – A

Questions 1 to 5 are passage questions:

Read the given passage and answer the questions 1 to 5 that follow:

For active metal, corrosion is common phenomenon. Metals like iron, copper, aluminium, silver shows corrosion. There are various methods used to prevent corrosion some of these are galvanization, electroplating, paint with colour, oxides of metal, cathodic protection, etc.

(1) What is rust, chemically?
(2) Is corrosion an electrochemical process?
(3) Is galvanization an electroplating phenomenon? Which metal is used for galvanization?
(4) Copper gets a greenish layer on its surface. What is it chemically?
(5) Silver is usually rusted by which substance?

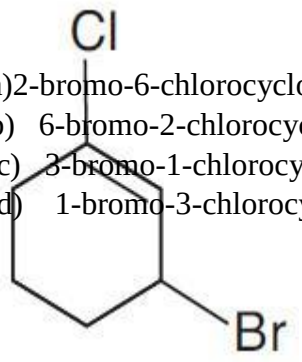
Questions 6 to 10 are one word answers:

(6) Name the substance used as depressant in the separation of two sulphide ores in Froth floatation method.
(7) Name the best reagent used for the separation of 1^0,2^0 and 3^0 amines.

(8) Name an oxoanion having oxidation number of metal equal to its group number.
(9) Which force are involved in holding the drugs to the active site of enzyme.
(10) Which of the following compounds would undergo Cannizzaro reaction:
Benzaldehyde, Cyclohexanone, 2- Methylpentanal.

Questions 11 to 15 are multiple choice questions:

(11) The IUPAC name of the compound shown below is:



(a)2-bromo-6-chlorocyclohex-1-ene
(b) 6-bromo-2-chlorocyclohexene
(c) 3-bromo-1-chlorocyclohexene
(d) 1-bromo-3-chlorocyclohexene

(12) When one mole of $CoCl_3.5NH_3$ was treated with excess of silver nitrate solution, 2 mol of AgCl was precipitated. The formula of the compound is:

(a) $[Co(NH_3)_5Cl_2]Cl$
(b) $[Co(NH_3)_5Cl]Cl_2$
(c) $[Co(NH_3)_4Cl_2]\ (NH_3)Cl$
(d) $[Co(NH_3)_3Cl_3]\ (NH_3)_2$

(13) The absorption maxima of several octahedral complex ions are as follows:

S.No	Compound	λ_{max} nm
1	$[Co(NH3)6]^{3+}$	475
2	$[Co(CN)6]^{3-}$	310
3	$[Co(H2O)6]^{3+}$	490

The crystal field splitting is maximum for:
(a) $[Co(H_2O)_6]^{3+}$
(b) $[Co(CN)_6]^{3-}$
(c) $[Co(NH_3)_6]^{3+}$
d) All the complex ions have the same splitting energy
(14) Predict the number of ions produced per formula unit in an aqueous solution of $[Co(en)_3]$ Cl3
a) 4
(b) 3
(c) 6
(d) 2

(15) The compound having the molecular formula C_3H_9N can represent

(1) Trimethylamine
(2) n-propylamine
(3) Isopropylamine
(4) All of these

Questions 16 to 20 :

(A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
(B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
(C) Assertion is correct, but reason is wrong statement.
(D) Assertion is wrong, but reason is correct statement.

16. Assertion: All Cr–O bond length in $K_2Cr_2O_7$are equal.
Reason: Both the Cr are present in dsp^2 hybrid state.

17. Assertion: FeCl3reacts with KCNS to give blood red colour.
Reason: FeCl3 reacts with KCNS to form potassium ferro-ferricyanide.

18. Assertion: The acidic strength of halogen acids varies in the order
HF>HCl>HBr>HI
Reason: The bond dissociation enthalpy of halogen acids decreases in the order:
HF>HCl>HBr>HI

19. Assertion: C_2H_5OH is a weaker base than phenol but is a stronger nucleophile than phenol.
Reason: In phenol the lone pair of electrons on oxygen is withdrawn towards the ring due to resonance.

20. Assertion: Aryl halides undergo nucleophilic substitution reactions with ease.
Reason: The carbon halogen bond in aryl halides has partial double bonds character.

SECTION: B

21. What are the main constituents of dettol?
22. The rate of a reaction depends upon the temperature and is quantitatively expressed as

$K = Ae^{-Ea/RT}$

i) If a graph is plotted between log k and 1/T, write the expression for the slope of the reaction?
ii) If at under different conditions Ea1 and Ea2 are the activation energy of two reactions If Ea1 = 40 J / mol and Ea2 = 80 J / mol. Which of the two has a larger value of the rate constant?

23. The experimentally determined molar mass for what type of substances is always lower than the true value when water is used as solvent. Explain. Give one example of such a substance and one example of a substance which does not show a large variation from the true value.

24. Write structure of the products formed:

(a) $CH_3CH_2COOH \xrightarrow[\Delta]{c\ell_2, red\ P_4}$

(b) $C_6H_5COC\ell \xrightarrow[\Delta]{H_2, Pd-BaSO_4}$

25. Draw one of the geometrical isomers of the complex $[Pt(en)_2Cl_2]^{2+}$ inactive. Also write the name of this entity according to the IUPACwhich is optically nomenclature.

OR

Discuss the bonding in the coordination entity $[Co(NH_3)_6]^{3+}$ on the basis of valence bond theory. Also, comment on the geometry and spin of the given entity. (Atomic no. of Co= 27)

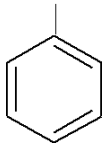
26. What is meant by Vapour phase refining? Write any one example of the process which illustrates this technique, giving the chemical equations involved.

OR

Write and explain the reactions involved in the extraction of gold.

27. Which one of the following compounds will undergo hydrolysis at a faster rate by SN_1mechanism? Justify.

$CH_3CH_2CH_2Cl$ or CH_2Cl



30. Answer the following questions:

(a) Which of the following electrolytes is most effective for the coagulation of AgI/Ag+ sol?
$MgCl_2$, K_2SO_4, $K_4[Fe(CN)_6]$

(b) What happens when a freshly precipitated $Fe(OH)_3$ is shaken with a little amount of dilute solution of $FeCl_3$.

(c) Out of sulphur sol and proteins, which one forms macromolecular colloids?

31. The vapour pressure of benzene at certain temperature is 640mm Hg. To 39.08 of benzene, non-volatile and non-electrolyte solid-weighing 2.175g was added. The vapour pressure of solution was 600mm of Hg. Find the mass of the solute?

32. Identify the product formed when propan-1-ol is treated with Conc.H_2SO_4 at 413 K. Write the mechanism involved for the above reaction.

33. (a)Give chemical tests to distinguish between the following pairs of compounds:

(i) Ethanal and Propanone.

(ii) Pentan-2-one and Pentan-3-one.

(b) Arrange the following compounds in increasing order of their acid strength:
Benzoic acid, 4- Nitrobenzoic acid, 3,4-Dinitrobenzoic acid, 4- Methoxybenzoic acid.

OR

Compare the reactivity of benzaldehyde and ethanal towards nucleophilic addition reactions. Write the cross aldol condensation product between benzaldehyde and ethanal.

34. Define and write an example for the following :

(a) Broad spectrum antibiotics.

(b) Analgesics

SECTION: D

35. (a) The e.m.f. of the following cell at 298 K is 0.1745 V

Fe (s) / Fe^{2+} (0.1 M) // H^+ (x M)/ H_2 (g) (1 bar)/ Pt (s)

Given: E^0Fe^{2+}/ Fe = 0.44V

Calculate the H+ ions concentration of the solution at the electrode where hydrogen is being produced.

(b) Aqueous solution of copper sulphate and silver nitrate are electrolysed by 1 ampere current for 10 minutes in separate electrolytic cells. Will the mass of copper and silver deposited on the cathode be same or different? Explain your answer.

OR

(a) 2 g of benzoic acid (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. KF for benzene is 4.9 K Kg mol-1. What is the percentage association of acid if it forms dimer in solution?

(b) Solutions of two electrolytes 'A' and 'B' are diluted. The limiting molar conductivity of 'B' increases to a smaller extent while that of 'A' increases to a much larger extent comparatively. Which of the two is a strong electrolyte? Justify your answer.

36. An organic compound A' with molecular formula C_7H_7NO reacts with Br_2/aq KOH to give compound B', which upon reaction with $NaNO_2$& HCl at O°C gives C'. Compound C' on heating with CH_3CH_2OH gives a hydrocarbon D'. Compound B' on further reaction with Br_2 water gives white precipitate of compound E'. Identify the compound A, B, C, D&E; also justify your answer by giving relevant chemical equations.

OR

(a) How will you convert:

(i) Aniline into Fluorobenzene.

(ii) Benzamide into Benzylamine.

(iii) Ethanamine to N,N-Diethylethanamine.

(b) Account for the following:

(i) pKb of aniline is more than that of methylamine.

(ii) Ethylamine is soluble in water whereas aniline is not.

(iii) Methylamine in water reacts with ferric chloride to precipitate hydrated ferric oxide.

37. (a) When a chromite ore (A) is fused with an aqueous solution of sodium carbonate in free excess of air, a yellow solution of compound(B) is obtained. This solution is filtered and acidified

with sulphuric acid to form compound (C). Compound (C) on treatment with solution of KCl gives orange crystals of compound (D). Write the chemical formulae of compounds A to D.

(b) Describe the cause of the following variations with respect to lanthanoids and actinoids:

(i) Greater range of oxidation states of actinoids as compared tolanthanoids.

(ii) Greater actinoid contraction as compared to lanthanoid contraction.

(iii) Lower ionisation enthalpy of early actinoids as compared to the early lanthanoids.

OR

Give reasons for the following:-

(i) Transition metals have high enthalpy of hydration.

(ii) Zn, Cd and Hg are not regarded as transition metal. (be

(iii) d lock lements exhibit a large number of oxidation state than f block elements.

(iv)The second and third members in each group of transition element have similar atomic radii. (v) K2 [PtCl6] is well known compound whereas the corresponding Ni compound is not known.