BRAIN INTERNATIONAL SCHOOL
Session 2025-26

PRACTICE PAPER 1
Class XII
Subject – Chemistry (043)

General instructions.

(i) This question paper has 33 questions with internal choice.
(ii) SECTION A consists 16 multiple –choice questions carrying 1mark each.
(iii) SECTION B consists of 5 short answer questions carrying 2 marks each.
(iv) SECTION C consists of 7 short answer questions carrying 3 marks each.
(v) SECTION D consists of 2 case-based questions carrying 4 marks each.
(vi) SECTION E consists of 3 long answer questions carrying 5 marks each.
(vii) All questions are compulsory.
(viii) Use of log table and calculators is not allowed

(Section- A)

The following questions are multiple choice questions with one correct answer. Each question carries 1mark.There is no internal choice in this section.

1. The alpha and beta forms of D(+) Glucose are known as
   (a) Enantiomers (b) Anomers
   (c) Epimers (d) Diastereomers
2. In the polysaccharides, the monosaccharides are linked to each other by:
   (a) Peptide linkage (b)Glycosidic linkage
   (c) Nucleosidic linkage (d) None of these
3. Which of the following give Tollen's test
   (a) Fructose (b) Starch
   (c) Cellulose (d) None of these

4. The e.m.f^0. of the cell at 25^0C

   $Zn \mid Zn^{+2}(0.01M) \parallel Fe^{+2}(0.005M) \mid Fe$

   $E_{(Zn+2 \mid Zn)} = -0.763V$ and $E_{(Fe+2 /Fe)} = 0.44V$

   (a) 1.203V (b)).203V

   (c) -0.523V (d) 2.203V

5. Which of the following is correct for spontaneity of a cell?

(a) ΔG= -ve,E^0=+ve (b) ΔG = +ve, E^0 = 0

(C) Δg = -ve,E^0 = 0 (d)ΔG = +ve, E^0 = -ve

6. The 'spin only'magnetic moment of Co^{2+} $ion_{(aq)}$[Z= 27]

(a) 5.9BM (b)9.5BM

(c) 3.9BM (d)6.0BM

7. Out of the following which is paramagnetic?

(a) SO_2 (b)S_2

(c) N_2 (d)Zn

8. What is the nature of bonding in Grignard reagent?

(a) Covalent bond (b)Ionic bond

(c) Coordinate bond (d)Mix bonding

9. Product formed by reaction of sodium phenoxide with iodo ethane in the presence of polar solvent is:

(a) $C_6H_5OC_2H_5$ (b) $C_2H_5OC_2H_5$

(c) $C_6H_5OC_6H_5$ (d) C_6H_5I

10. Alcohols can be prepared by which of the following:

(a) Hydrolysis of alkenes (b) Reduction of alkenes

(c) Reduction of cyanides (d) Hydrolysis of cyanides

11. Benzyl chloride can be prepared from benzyl alcohol by reaction with:

(a) $PoCl_3$ (b) $SOCl_2$

(c) Cl_2 (d) NaOCl

12. When ethanal reacts with hydrogen cynide followed by hydrogenation then product formed is:

(a) 2-Hydroxy propanamide (b) Propanamine

(c) Butanamine (d) 2- Hydroxy propanamine

Questions 16 to 18 are assertion and reason type:

a) If assertion and reason both are correct and reason is correct explanation of Ass.

b) If assertion and reason both are correct and reason is not correct explanation of Ass.

c) If assertion is correct but reason is incorrect.

d) If assertion and reason both are incorrect.

13. Assertion. Benzene diazonium chloride on warming with H_3PO_2 gives benzene.

Reason. C-N bond is polar.

14. Assertion. Boiling point of three degree amines is less than primary amines..

Reason. Three degree amines have weaker dipole-dipole interaction while primary amines show strong H- bonding .

15. Assertion: Glycogen is polymer of α- D- glucose.

Reason: It provides energy in scarcity of food.

16. Assertion: Fibrous protein does not dissolve in water.

Reason: It is three degree protein.

(Section-B)

This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.

17. (a)What is abnormal molar mass ?
(b)What is anoxia ?
18. (a)Give one example of the swarts reaction.
(b)How benzyl alcohol can be prepared from toluene?
19. Convert:

(a)Ethyl alcohol to diethylether (b)Phenol to salicylic acid

Or

Write the chemical distinguish test between following pair of compounds;

(a)Isopropyl alcohol and propyl alcohol

(b) secondary and primary alcohol

20. (a)Aniline undergoes bromination in o- and p- position but if a strong acid is present in reaction mixture then it gives m- bromoaniline. Explain

(b)Account for the fact that it is difficult to prepare pure amines by ammonolysis of alkylhalide.

21.An organic compound has formula $C_4H_6O_2$it gives tollen's test as well as iodoform test.Draw its molecular structure and show reactions.

(Section-C)

22. Give possible explanation for each of the following:

(a)Cyclohexanone forms cynohydrin and gives good yield but 2,2,6 – trimethyl Cyclohexanone does not.

(b)There are two NH_2 groups in semicarbazide. However, only one is involved in the reaction with carbonyl compounds.

(c)During the preparation of esters from carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester should be removed as soon as it is formed.

Or

Describe the following:

(a) Aldol condensation (b)Cannizaro reaction

23. How are the following conversions achieved:

(a)Acetone to propene

(b)Ethaol to ethene

(c)Propanal to butanal

24. For a decomposition reaction the values of rate constant k at different temperatures are given below

$k_1 = 2.15 \times 10^{-8}$ L $mol^{-1}s^{-1}$at 650 K

$k_2 = 2.39 \times 10^{-7}$ $Lmol^{-1}$ s^{-1} at 700K

Calculate the value of activation energy for this reaction.[$R = 8.314Jk^{-1}mol^{-1}$]

25. For the complex $[NiCl_4]^{2-}$, write

(a)The IUPAC name

(b)The type of hybridization

(c)Shape of complex

26. How temperature and catalyst effect rate of reaction? Explain drawing graph.

27. Find charge required in following processes:

(a) 1mole $Cr_2O_7^{2-}$ converts into Cr^{3+}

(b) 1mole water into oxygen gas.

(c)1mole H_2O_2 into oxygen gas.

28. Give reason for the following:

(a) Halo arenes do not show nucleophilic substitution reaction.

(b)Chloroform cannot use as anaesthetic substance.

(c)P-Dichlorobenzene shows higher M.P. than o-Dichlorobenzene.

(Section-D)

The following questions are case-based study type each of 4(1+1+2)marks having internal choice in one part.

29. Transition elements are located from third to twelfth group in periodic table ,last electron inters into d-sub shell in electronic configuration. these show variable oxidation states there these cane form coordinate compounds. Coordinate compounds show two type of valencies, primary as well as secondary. These compounds are useful as chlorophyll and haemoglobin.In aqueous solution these do not completely convert into its ions.

(a) What is the coordination number of iron in $[Fe\ (EDTA)]^{-}$?

Or

Write the name of a complex compound used in chemotherapy.

(b). Arrange the following in the increasing order of electrical conductivity in solution.
$[Ni(NH_3)_6]Cl_2$; $[Co(NH_3)_6]Cl_3$ and $[CoCl_2(en)_2]$ Cl

(c). Explain the following :
$[Fe(CN)_6]^{3-}$ is an inner orbital complex whereas $[FeF_6]^{3-}$ is an outer Orbital complex.

30. There are two type of cells one which convert chemical energy into electrical energy and other convert electrical energy into chemical energy. Primary shells cannot be recharged like dry cell while secondary cells can be recharged like lead storage battery. There are third type which are known as fuel cells these convert heat energy into electrical energy these show high efficiency.

(a)Name the cell which is used in hearing aids.

(b)Why does the conductivity of a solution decreases with dilution?

Or

Give the importance of fuel cells over ordinary batteries.

(c). Give the factors which affect corrosion of silver and copper.

(Section-E)

31. (a)Ethylene glycol is better than ethanol to prepare antifreeze mixture. Explain.

(b)Explain the following terms:

(i)Edema (ii) Bends formation in scuba divers (iii) Haemolysis

32. (a)Write the electronic configuration of Cr^{3+} ion (atomic number of Cr = 24)?
(b) Explain $CuSO_4$. $5H_2O$ is blue while $ZnSO_4$ is colourless?

(c) In 3d series (Sc to Zn), the enthalpy of atomization of Zn is low. Why?

Or

(a) The +3 oxidation state of lanthanum (Z = 57), gadolinium (Z = 64) and lutetium (Z = 71) are especially stable. Why?

(b) Mention one consequence of Lanthanide Contraction?

(c) The first ionization enthalpies of 5*d*– series elements is higher than those of 3*d* and 4*d* series elements why?

33. (a)Give name of products when benzaldehyde react with Conc.NaOH.

(b)Why ketones are less reactive than aldehydes for reaction with $NaHSO_3$.

(c)Why ketones show more B.P. than aldehydes?

(d)Formic acid shows Tollen's test

(e)Why 2,2-Dimethylpropanal does not show Aldol condensation.

Or

(a) Write the equations for reaction to convert acetophenone into ethyl benzene.

(b) Explain the following terms:

(i)Acetal (ii) immine

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PRACTICE PAPER 2
Class XII
Subject – Chemistry (043)

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(iv) SECTION C consists of 7 short answer questions carrying 3 marks each.
(v) SECTION D consists of 2 case-based questions carrying 4 marks each.
(vi) SECTION E consists of 3 long answer questions carrying 5 marks each.
(vii) All questions are compulsory.
(viii) Use of log table and calculators is not allowed

(Section- A)

The following questions are multiple choice questions with one correct answer. Each question carries 1mark.There is no internal choice in this section.

1. A primary alkyl halide would prefer to undergo
   (a) SN^1 reaction (b) SN^2 reaction
   (c) α- elimination (d) racmisation
2. Phenol can be distinguished by the reagent
   (a) bromine water (b) ferric chloride solution
   (c) iron metal (d) Chlorine water
3. Which compound will form if chloroform is kept in open?
   (a) guanine gas (b) cytosine gas
   (c) Phosgene gas (d) Phosmyne gas
4. Identify the compound 'Y' in the following reaction.
   C_6H_5-NH_2 $\frac{NaNO2+HCl}{273-274k}$ 'X' $\frac{Cu2Cl2}{HCl}$ 'Y'
   (a)C_6H_5-Cl (b)C_6H_6
   (c)m- dichlorobenzene (d)P- dichlorobenzene
5. The compounds Chloroethane and chloroethene can be distinguished by reacting with:
   (a) $AgNO_3 + HNO_3$ (b) $AgCl + HNO_3$
   (c) $CuCl_2 + HCl$ (d) NaOH (aq)
6. Phenol on reacting with NaOH(aq) will give:
   (a) Sodium phenoxide (b) α-D Phenol
   (c)β-D Phenol (d) Sodium propoxide

7. Which of the following is strong field legend.

(a) CO (b) F

(c) NO_2 (d) Glycine

8. Which of the following transition metal ion is not coloured?

(a)Cu^{+} (b) V^{3+}

(c) Co^{2+} (d) Ni^{2+}

9.Which of the following pairs has the same ionic size?

(a)Fe^{2+},Ni^{2+} (b) Zr^{4+},Ti^{4+}

(c)Zr^{4+},Hf^{4+} (d) Zn^{2+},Hf^{4+}

10.$e^{-Ea/RT}$ represents;

(a) energy of activation (b)total number of collisions

(c) effective number of collisions (d) enthalpy of reaction

11. An electrochemical cell behave like an electrolytic cell when.

(a)Ecell = Eexternal (b)Ecell = 0

(c)Eexternal > Ecell (d) Eexternal< Ecell

12.To deposit 6g of Mg in process of electrolysis require:

(a) 1F (b) 2F

(c)0.5F (d) 0.25F

Questions 13 to 16 are assertion and reason type:

(a) a) If assertion and reason both are correct and reason is correct explanation of Ass.

(b) b) If assertion and reason both are correct and reason is not correct explanation of Ass.

(c) c) If assertion is correct but reason is incorrect.

(d) d) If assertion and reason both are incorrect.

13. Assertion: Mixture of Ethoxy ethane and water will show positive deviation.
Reason: Inter molecular force of attraction will be less.

14. Assertion: Phenol on reacting with sulphonyl chloride will produce chlorobenzene .

Reason: -OH group will replace by Cl.

15. Assertion: Phenol on nitration forms –o,-p and m- derivatives.
Reason: -OH group is activating group.

16. Assertion: Electrical conductivity of CH3COOH sol. Will not increase on dilution.
Reason: Number of ions increase many times on dilution.

(Section-B)

This section contains 5 questions of 2mark each.

17. When 1 mole of NaCl is added to 1 litre water, the boiling point increases?
When 1 mole of CH_3OH is added to 1 litre water, the boiling point decreases? Suggest reasons.

18. Give a chemical test to distinguish between the following pairs of compounds:

(a) chlorobenzene and cyclohexylchloride.

(b) vinyl chloride and ethyl chloride.

19. Describe the following reactions with example :
    (a) Hydroboration oxidation of Propene.
    (b) Acid catalysed dehydration of alcohols at 413K.
20. How will you bring about the following conversions?
    (a) benzene to chlorobenzene
    (b) Chlorobenzene to di-phenyl
21. Write the reaction of phenol with following compounds:
    (a) conc.Nitric acid
    (b) Ethanoic anhydride

(Section-C)

The following questions are short answer type with one internal choice carry 3 marks each.

22. Explain, why
    (a) Less reactive metal should not coat to protect Fe from corrosion.
    (b) Magnesium pieces should tie with underground iron pipes.

23. Write short notes on the following
    (a) Sendmeyer reaction (b) Gatterman Coach reaction
24. A reaction has half-life of 20 min.
    (a) Calculate the rate constant for the first order reaction.
    (b) What fraction of reactant will be left after an hour of the reaction? [$\log^{-1}$ 0.9027=8.011]
25. Derive integrated form for first order gaseous reaction.
26. Explain crystal field theory show splitting of d-subshell for octahedral complex.
27. Give reason for the following:
    (a) Inspite of having hydroxyl group phenol is almost insoluble in water.
    (b)2-methoxy-2-methyl propane on reacting with HI gives products against rule bigger goes with smaller.
    (c) 2-chloro-2-methyl propane on reacting with sodium methoxide does not produce ether.
28. (a) Write the molecular structure of compound formed by reaction of CH_3Cl and AgCN
    (b) Write the molecular structure of compound formed by reaction of CH_3Cl and KCN .
    (c) Write the molecular structure of compound formed by reaction of Propanol with PCC.

(Section-D)

The following section has two case-based study types questions each of 4(1+1+2)marks with one internal choice.

29. Electrical conductivity is two types, by flowing of electrons in metals other by flowing of ions in the solutions. If temperature is increased then electrical conductivity of metals is

decreased but of solutions increase because viscosity of solvent decrease. Molar conductivity of solutions is due to conductivity of all the ions present in 1M solution. Molar conductivity of strong electrolyte increase very less on dilution but of weak electrolyte increase many times.

(a) Write the Debey's-Huckle –Osangar equation.

(b) Define Kohlrausch law independent motion of ions.

(c) Find time required to deposit 0.0208g silver by flowing 2A current.[molar mass Ag=108g/mole]

30. Transition metals are located between s-block and p- block elements and properties transits between these two therefore these are known as transition elements, properties of these depends on unpaired electrons like colour, catalytic property, coordinate compounds formation. These are elastic and tensile. Compounds of these like potassium permagnate and potassium dichromate are used as good oxidising agents in organic chemistry.

(a) Which d- block elements of first series show highest melting point.

(b) Find spin magnetic moment of ferric ion.

(c) What is lanthanoid contraction? Give reason for it.

(Section-E)

31. An organic compound 'A' having formula C_6H_6O forms two compounds 'B' and 'C' on reacting itself in di. NaOH solution and $CHCl_3$,compound 'B' on reacting with CH_3Cl forms compound 'D'which gives Lucas test. While compound 'C'on reacting with mild oxidizing forms compound 'E'.Find molecular structure of A,B,C and D also write chemical equation for evolved reactions.

32. Calculate the boiling point of Aluminium chloride solution which dissociate 90% containing 20g solute in 200g water [Kb = 0.52kkgmol^{-1}, At.wt. of Al= 27g and of Cl = 35.5g]

33. Write the balanced chemical equations to prepare potassium dichromate.Also write its balanced chemical equation with $C_2O_4^{2-}$ in acidic medium.