CLASS:XII
SUBJECT: CHEMISTRY
Sample question paper

BLUE PRINT

S.No.	Unit	VSA (1mark) M(Q)	SA I (2marks) M(Q)	SAII (3marks) M(Q)	LA (5marks) M(Q)	Total M(Q)	Total
1	Solutions	5(5)	2(1)			7(2)	23
2.	Electrochemistry			3(1)	5(1)	8(2)	
3.	Chemical kinetics		2(1)	3(1)		5(2)	
4.	Surface chemistry			3(1)		3(1)	
5.	General principles and processes of extraction of metals	1(1)	2(1)			3(2)	19
6.	p block elements		2(1)		5(1)	7(2)	
7.	d- and f- block elements	1(1)	2(1)	3(1)		6(3)	
8.	Co-ordination compounds	1(1)	2(1)			3(2)	
9.	Haloalkanes and haloarenes	3(3)				3(3)	28
10	Alcohols and phenols	1(1)		3(1)		4(2)	
11	Aldehydes and ketones	2(2)			5(1)	7(3)	
12	Compounds containing nitrogen		2(1)	3(1)		5(2)	
13	Biomolecules	3(3)				3(3)	
14	Polymers	3(3)				3(3)	
15	Chemistry in everyday life			3(1)		3(1)	
	TOTAL	**20(20)**	**14(7)**	**21(7)**	**15(3)**	**70(37)**	**70**

SAMPLE QUESTION PAPER (2019-20)
CHEMISTRY
CLASS XII

TIME:-3 HRS   MM:-70

General Instructions:

   a. All questions are compulsory.
   b. Section A: Question No. 1-20 are very short answer of 1 mark each.
   c. Section B: Question No. 21-27 are short answer questions of 2 marks each.
   d. Section C: Question No. 28-34 are long answer questions of 3 marks each.
   e. Section D: Question No. 35-37 are also long answer questions of 5 marks each.
   f. There is no overall choice. However internal choice has been provided in two questions of two marks, two questions of three marks and all the three questions of five marks. 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

Passage based questions (Q. No. 1 to 5)

Read the passage and answer the following questions.
When a non-volatile solute is added to a solvent, the freezing point of thus formed solution is always lower than that of pure solvent. This difference in freezing point is known as depression in freezing point. If ΔT_f^0 is the freezing point temperature of pure solvent and
T_f is the freezing point temperature of the solution when non-volatile solute is added to it, then depression in freezing point (ΔT_f) is given by,
$$\Delta T_f = T_f^0 - T_f$$
For the dilute solutions, $\Delta T_f = K_f m$ (where m is molal concentration of the solution.

SECTION - A

Q1. Why the freezing point of the solution is always lower than that of pure solvent?   **(1)**

Q2. Write the formula relating depression in freezing point with molar mass of solute.   **(1)**

Q3. Define the proportionality constant (K_f).   **(1)**

Q4. Write the unit of K_f.   **(1)**

Q5. Calculate the depression in freezing point of 5% glucose in water. (K_f =13.962).   **(1)**

One Word Answer Type Questions (Q.Nos. 6-10)

Q6. Name a sulphide ore which is not concentrated by froath-floatation process.   **(1)**

Q7. Name the compound which is slowly oxidised by air in presence of light to form phosgene. **(1)**

Q8. Which isomer of [CoCl$_2$(en)$_2$]$^+$ does not show optical isomerism.   **(1)**

Q9. Name the term given for the carbohydrates which differ in configuration at the carbon **(1)** other than two anomeric carbon.

Q10. What type of polymerization reaction occurs in the formation of Teflon polymer. **(1)**

Multiple choice questions (Q.Nos.11 to 15)

Q11. Among the following, the molecule with the highest dipole moment is **(1)**

    a. CH_3Cl

    b. CH_2Cl_2

    c. $CHCl_3$

    d. CCl_4

Q12. CH_3CH_2OH can be converted to CH_3CHO by............ **(1)**

    a. Catalytic hydrogenation

    b. Treatment with $LiAlH_4$

    c. Treatment with Pyridinium Chloro Chromate

    d. Treatment with $KMnO_4$

Q13. Which is the correct IUPAC name of **(1)**

    a. 1-chloro-4-methylbenzene

    b. 4-chloro-1-methylbenzene

    c. 1-methyl-4-chlorobenzene

    d. 4-methyl-1-chlorobenzene

Q14. Dacron is continuous filament yarn used in curtains, dress fabrics and pressure fire hoses. The reaction for preparing Dacron is by combination of which of the following

    a. Hexamethylene diamine and Adipic acid

    b. Caprolactum

    c. Phenol and formaldehyde

    d. Ethylene glycol and terepthalic acid

Q15. When Br_2 is treated with aquous solutions of NaF, NaCl, NaI respectively **(1)**

    a. F_2, Cl_2 and I_2 are liberated

    b. Only F_2 and Cl_2 are liberated

    c. Only I_2 is liberated

    d. Only Cl_2 and I_2 are liberated

Assertion-Reason(Q.Nos.16 to 20)

Following are four options for each question. Out of these, only one is correct. You have to identify the correct statement

    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 incorrect statement.

    d.   Assertion is incorrect, but Reason is correct statement.

Q16. **Assertion :** Ambidentate ligands lead to linkage isomerism.

    Reason : The ionization sphere is different in different linkage isomers. **(1)**

Q17. **Assertion :** Formic acid reduces Tollen's Reagent**.**

    Reason : Compounds containing CHO group reduces Tollen's reagent. **(1)**

Q18. **Assertion :** The two strands of DNA are complimentary.

    Reason : Cytosine always pairs with Guanine and Thymine pairs with Adenine **(1)**

Q19. **Assertion :** β-Glycosidic linkage is present in Maltose.

    Reason : Maltose is compound of two glucose units in which C-1 of one glucose unit

       is linked to C-4 of another glucose unit. **(1)**

Q20. **Assertion: 1, 3**-Butadiene is the monomer for natural rubber.

   **Reason** : Natural rubber is formed through anionic addition polymerisation **(1)**.

SECTION B

Q21. Vapour pressure of water at 293K is 17.535mmHg. Calculate the vapour pressure of water at 293K when 25 gm of glucose is dissolved in 450 gm.of water. **(2)**

OR

H$_2$S a toxic gas with rotten egg like smell is used for qualitative analysis. If the solubility of H$_2$S in water at STP is 0.195 m, calculate Henry's law constant.

Q22. Consider the diagram for a reaction $A_2 + B_2 \rightleftharpoons 2AB$ and calculate
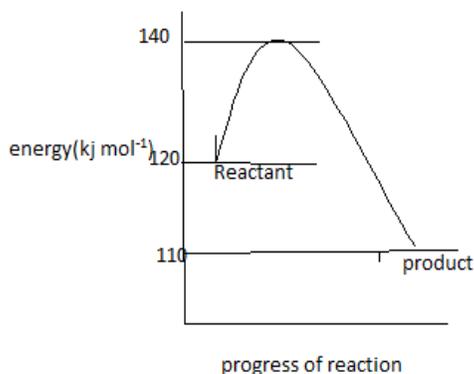
(a.) ΔE of the reaction

(b.) The energy of activation for forward and backward reactions. **(1+1)**

Q23. Give the principle of following methods **(1+1)**

(a) Van Arkel method

(b) Vapour phase refining

Q24. Complete the following equations **(1+1)**

(a) $Cr_2O_7^{-2} + 6I^- + 14 H^+ \longrightarrow$

(b) $2MnO_4^- + 5SO_2 + 16H^+ \longrightarrow$

Q25. $[NiCl_4]^{2-}$ is green while $[Ni(CN)_4]^{2-}$ is diamagnetic. Explain why? **(1+1)**

OR

Write the IUPAC name of $[Cr(NH_3)_2Cl_2(en)]^+$ and draw the structure of its optical isomers.

Q26. Tert-Butyl bromide reacts with aq. NaOH by SN^1 mechanism while n-Butyl bromide reacts by SN^2 mechanism. Explain with reason. **(2)**

Q27. Give the structures of A and B in the following reaction: **(½+½+1)**

(a) $C_6H_5NO_2$ $\underrightarrow{Fe/HCl}$ A $\underrightarrow{NaNO+HCl}$ B

(b) Arrange the following in increasing order of their basic strength in gas phase

$C_6H_5NH_2$, $C_6H_5N(CH_3)$, $(C_6H_5)_2NH$ and CH_3NH_2
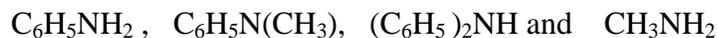
SECTION C

Q28. State Kohlrausch's law of independent migration of ions. Calculate the molar conductivity of a solution of $MgCl_2$ at infinite dilution .Given that the molar ionic conductivities of $\lambda^0(Mg^{+2}) = 106.1S\ cm^2\ mol^{-1}$ and $\lambda^0(Cl^-) = 76.3\ S\ cm^2\ mol^{-1}$.

(1+2)

Q29. The following data was obtained during the first order thermal decomposition of SO_2Cl_2 at constant volume

$$SO_2Cl_2\ (g) \longrightarrow SO_2\ (g)\ +\ Cl_2(g)$$

Experiment	Time /s	Total Pressure /atm
1	0	0.5
2	100	0.6

Calculate the rate of reaction when total pressure is 0.65.   **(3)**

Q30. (a) How does a solid catalyst enhance the rate of combination of gaseous molecules?

   (b) Give one example each of associated and multi-molecular colloid.

   (c) Write the dispersed phase and dispersion medium of

   i) Smoke   ii)Milk.   **(1+1+1)**

Q31. How would you account for the following?   **(1+1+1)**

i.   With the same *d*-orbital configuration (d^4) Cr^{2+} is a reducing agent while Mn^{3+} is an oxidizing agent.

ii.   The actinoids exhibit a larger number of oxidation states than the corresponding members in the lanthanoid series.

iii.   Most of the transition metal ions exhibit characteristic colours in aqueous solutions.

OR

Explain the following:

i.   The transition elements have great tendency for complex formation.

ii. There is a gradual decrease in the atomic sizes of transition elements in a series with increasing atomic numbers.

iii. Lanthanum and Lutetium do not show colouration in solutions.

(At. No.: La= 57, Lu = 71)

Q.32 Write the mechanism of acid-catalysed dehydration of ethanol to yield ethene.

OR

Account for the following **(1+1+1)**

i. Propanol has higher boiling point than butane

ii. Ortho-nitrophenol is more acidic than ortho-methoxyphenol

iii. (iii)Preparation of ethers by acid dehydration of secondary or tertiary alcohols .
not a suitable method

Q33. Give one chemical test each to distinguish between the compounds in the following pairs:

i. Methylamine and dimethylamine. **(1+1+1)**

ii. Phenol and Acetic acid

iii. Acetaldehyde and Benzaldehyde

Q34. Describe the following with one example in each case. **(1+1+1)**

a. Disinfectants

b. Broad Spectrum Antibiotics

c. Tranquilizers

SECTION D

Q35.

a. Predict the products of electrolysis of aqueous solution of $AgNO_3$ using platinum electrode.

b. How much charge is required for reduction of 1 mol of MnO_4^- to Mn^{+2}

c. Write the Nernst equation and determine the e.m.f. of the following cell at 298 K:

$$Mg\,(s)\,|\,Mg^{2+}\,(0.001\ M)\,||\,Cu^{2+}\,(0.0001\ M)\,|\,Cu\,(s)$$

$$(\text{Given}: E^{\circ}_{Mg^{2+}/Mg} = -2.375\ V, E^{\circ}_{Cu^{2+}/Cu} = +0.34\ V)$$ **(1+1+3)**

OR

a. Define conductivity and molar conductivity for the solution of an electrolyte. How do they vary when the concentration of electrolyte in the solution increases?

b. Three conductivity cells A, B and C containing solutions of zinc sulphate, Silver Nitrate and Copper Sulphate respectively are connected in series. A steady current of 1.5 amperes is passed through them until 1.45 g of Silver is deposited at the cathode of cell B. How long did the current flow? What mass of copper and what mass of zinc got deposited in their respective cells?

(Atomic mass : Zn = 65.4 u, Ag =108 u, Cu = 63.5 u)   **(2+3)**

Q.36)

a. Draw the structures of the following: **(2+1+1+1)**

   (i) XeO_3

   (ii) $HClO_4$

b. Give an explanation for each of the following observations:

   i. SO_3 has zero dipole moment.

   ii.   Noble gases form compounds with fluorine and oxygen only?

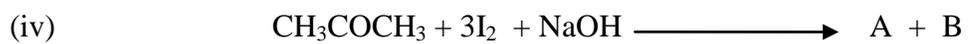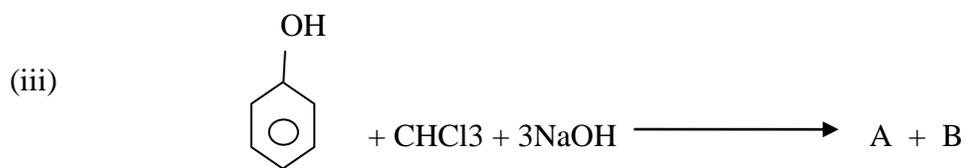   iii. ICI is more reactive than I_2.

OR

(a) Write chemical equations for the following processes

   (i)   Chlorine reacts with hot and concentrated sodium hydroxide solution.

   (ii) XeF_2 is hydrolysed completely.

(b) Arrange the following in the increasing order of property indicated :

   a) HF, HCl, HBr, HI (increasing bond dissociation enthalpy)

   b) H_2O, H_2S, H_2Se, H_2Te (increasing order of acid strength)

   c) F_2, Cl_2, Br_2, I_2 (increasing bond dissociation enthalpy)

Q.37) . (*a*) How will you bring about the following conversions**:**   **(2+1+1+1+1)**

   (*i*) Ethanol to 3-hydroxybutanal

   (*ii*) Benzaldehyde to Benzophenone.

(b)Complete the following reactions

(i) $$\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{2\ CH_3\text{-}C\text{-}CHO}} \xrightarrow{\text{NaOHconc.}} A\ +\ B$$

(iii)

OH
$\bigcirc$ + CHCl3 + 3NaOH $\longrightarrow$ A + B

(iv) $CH_3COCH_3 + 3I_2 + NaOH \longrightarrow$ A + B

OR

(a) Illustrate the following name reactions giving a chemical equation in each case:

(i) Clemmenson's reduction (ii) Cannizaro's reaction

(*b*) Describe how the following conversions can be brought about:

(*i*) Cyclohexanol to cyclohexan-1-one

(*ii*) Ethylbenzene to benzoic acid

(iii)Propanamide to ethyl amine

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