

CBSE board
Class XII Chemistry
Sample Paper - 14

Time Allowed: 3 Hrs

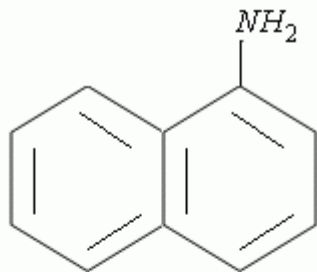
Maximum Marks: 70

1. All questions are compulsory.
2. Question nos. **1 to 8** are very short answer questions and carry 1 mark each
3. Question nos. **9 to 18** are short answer questions and carry 2 marks each.
Use of calculator is not permitted.
4. Question nos. **19 to 27** are also short answer questions and carry 3 marks each
5. Question nos. **28 to 30** are long answer questions and carry 5 marks each
6. Use log tables if necessary, use of calculators is not allowed.

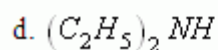
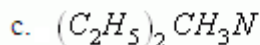
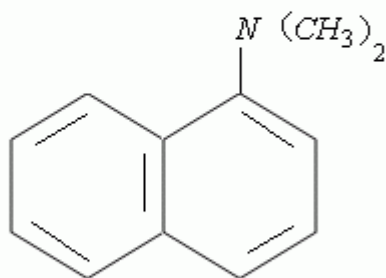
- Q 1.** What is the cause of adsorption?
- Q 2.** Write the reaction of HCHO with Tollen's reagent.
- Q 3.** What product is formed which acetic acid reacts with PCl_5 ?
- Q 4.** Explain why alkyl halides though polar are immiscible with water?
- Q 5.** Give IUPAC name of the compound $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OCH}_3$
- Q 6.** What is oxidation state of Co in complex $[\text{Co}(\text{NH}_3)_2(\text{NO}_2)\text{Cl}]\text{Cl}$
- Q 7.** Name the enzyme which converts sucrose into glucose and fructose.
- Q 8.** The specific rate of a reaction is $6.2 \times 10^{-3} \text{ mol L}^{-1}\text{s}^{-1}$. What is the order of the reaction?
- Q 9.** Time required to decompose SO_2Cl_2 to half of its initial amount is 60 minutes. If the decomposition is a first order reaction, calculate the rate constant of the reaction.
- Q 10.** What happens when:
- (i) Nitroethane is treated with LiAlH_4
 - (ii) Diazonium chloride reacts with phenol in basic medium.
- Q 11.** A first order decomposition reaction takes 40 minutes for 30% decomposition. Calculate its $t_{1/2}$.

Q 12. Classify the following amines as primary, secondary or tertiary amines:

a.



b.



Q 13. Gold (atomic radius = 0.144 nm) crystallises in a face-centred unit cell. What is the length of a side of the unit cell in meter?

OR

Aluminium crystallises in a cubic close-packed structure. Its metallic radius is 125 pm. How many unit cells are there in 1.0 cm³ of aluminium?

Q 14.

(a) Though nitrogen exhibits +5 oxidation state, it does not form pentahalide. Give reason?

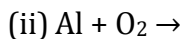
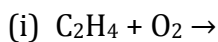
(b) PH₃ has lower boiling point than NH₃. Why?

Q 15. If a current of 0.5 ampere flows through a metallic wire for 2 hours, then how many electrons would flow through the wire?

Q 16. Explain the valencies in coordination compounds given by Werner.

Q 17. State two differences between Schottky and Frenkel defects?

Q 18. Complete the following reactions:



Q 19.

(i) Why are deltas formed at places where river meets sea?

(ii) List two characteristics of catalysts.

(iii) What are macromolecular colloids? Give an example.

OR

Explain the following terms:

(i) Lyophilic sols

(ii) Lyophobic sols

(iii) Emulsions

Q 20. Write the name and structure of monomer/s of each. Give a use of each polymer.

(i) Nylon-6, 6

(ii) Buna-S

Q 21.

(a) Why is the reduction of a metal oxide easier if the metal formed is in liquid state at the temperature of reduction?

(b) Explain liquation method?

(c) Explain Mond's process for refining nickel?

Q 22. What happens when:

(a) Concentrated H_2SO_4 is added to calcium fluoride

(b) SO_3 is passed through water

(c) PCl_3 is reacted with moisture

Q.23.

(i) Name the forces that are involved in holding the drugs to the active site of enzymes?

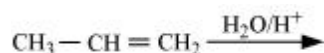
- (ii) Name the drug used for treatment of typhoid. What type of drug it is?
- (iii) What are the consequences of using non-biodegradable detergents?

Q 24. Write the equations for the preparation of 1-iodobutane from:

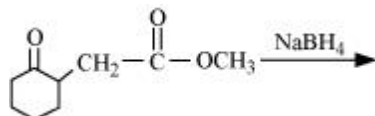
- (i) 1-butanol
- (ii) 1-chlorobutane
- (iii) but-1-ene

Q 25. Write structures of the products of the following reactions:

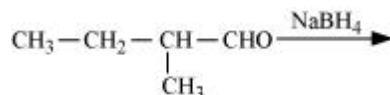
(i)



(ii)



(iii)



Q 26.

- (i) The two strands in DNA are not identical but are complementary. Explain.
- (ii) Define essential amino acids and non-essential amino acids. Give one example of each?

Q 27.

- (i) Give one example of primary and secondary battery each.
- (ii) Write the reactions taking place at anode and cathode in a mercury cell.

Q 28. How will you bring about the following conversions in not more than two steps?

- (i) Propanone to propene
- (ii) Benzoic acid to benzaldehyde
- (iii) Ethanol to 3-hydroxybutanal

(iv) Benzene to *m*-nitroacetophenone

(v) Benzaldehyde to benzophenone

OR

Q 28.

(i) What is meant by the following terms? Give an example.

(a) Acetal

(b) Aldol

(ii) Explain by giving the reactions of the following:

(a) Benzoyl chloride is hydrogenated over catalyst palladium on barium sulphate.

(b) Carboxylic acid when treated with bromine in presence of FeBr_3

(c) Acidic hydrolysis of ethyl benzoate.

Q 29.

(a) Will the elevation in boiling point be same if 0.1 mole of sodium chloride or 0.1 mole of sugar is dissolved in 1 L of water? Explain.

(b) 0.5 g KCl was dissolved in 100 g of water and the solution originally at 200°C , froze at 0.240°C . Calculate the percentage ionization of salt. K_f per 1000g water = $1.86 \text{ K kg mol}^{-1}$, Atomic mas of K = 39, Cl = 35.5

OR

Q 29.

(a) Which colligative property is preferred for the molar mass determination of macromolecules? Give two reasons.

(b) What is the mass of non-volatile solute which should be dissolved in 114 g octane to reduce its vapour pressure to 80%. Molar mass of solute is 40.

Q 30.

(a) Which out of $\text{Lu}(\text{OH})_3$ and $\text{La}(\text{OH})_3$ is more basic and why?

(b) In the series Sc ($Z = 21$) to Zn ($Z = 30$), the enthalpy of atomization of zinc is the lowest, i.e., 126 kJ mol^{-1} . Why?

(c) The $E^\circ (\text{M}^{2+}/\text{M})$ value for copper is positive ($+0.34\text{V}$). What is possibly the reason for this? (Hint: consider its high $\Delta_a H^\circ$ and low $\Delta_{\text{hyd}} H^\circ$)

OR**Q 30.**

(a) Write the steps involved in the preparation of:

(i) $\text{K}_2\text{Cr}_2\text{O}_7$ from Na_2CrO_4

(ii) KMnO_4 from K_2MnO_4

(b) Explain how the colour of $\text{K}_2\text{Cr}_2\text{O}_7$ solution depends on the pH of the solution?