

Sahodya School

QP-10

SUMMATIVE ASSESSMENT-I (2014-15)

CLASS: XII SUBJECT: CHEMISTRY

TIME: 3HOUR

M.M:70

General Instructions:-

- a) QNo 1 to 5 carry 1 mark each.
- b) QNo 6 to 10 carries 2 marks each.
- c) QNo 11 to 22 carries 3 marks each.
- d) QNo 23 carries 4 marks each.
- e) QNo 24 to 26 carries 5 marks each.

Use log tables Where ever necessary.

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Q1. Which of the following aqueous solution has higher freezing point.

- a) 1m NaCl
- b) 1m glucose
- c) 1m K_2SO_4

Q2. State Henry's law.

Q3. Why does a mercury cell give a constant potential difference through out the life.

Q4. Write the IUPAC Name of $Na_3[Fe(CN)_3Br_2(NO_2)]$

Q5. Write the IUPAC Name of $OHC - CH_2 - CH(CHO)CH_2 - CHO$.

Q6. Calculate the packing efficiency of body centred cubic unit cell.

Q7. State Kohlrausch's law and mention its application.

Q8. Compare the following regarding lanthanoids and actinoids.

- a) Oxidation state
- b) Ionization enthalpy

Q9. Draw diagram showing crystal field splitting in octahedral complex. What will be electronic configuration of d^4 when $\Delta_0 < p$.

Q10. What is SN^2 reaction? Explain SN^2 mechanism with example.

Q11. a) What is F-centre?

- b) Distinguish between Schottky defect and Frenkel defect.

Q12. Niobium crystallises to have BCC structure with density of $8.55g/cm^3$. Calculate the radius of Niobium atom. If atomic mass of Niobium is 93u.

Q13. A solution of glucose in water is labelled 10% W/W. What would be the molality and mole fraction of each component in the solution? If the density of solution is $1.2g/ml$, then What shall be the molarity of the solution.

Q14. Conductivity of $0.00241M$ acetic acid is $7.896 \times 10^{-5} S cm^{-1}$. Calculate its molar conductivity and if $\Lambda^{\circ m}$ of acetic acid is $390.5 S cm^2 mol^{-1}$, what is its dissociation constant?

Q15. Account for the following

- a) Cu^+ Ion is not stable in aqueous solution.

- b) Zr and H_f have almost same atomic radii.
c) Transition metals and their many compounds act as good catalyst.

Q16. Discuss the hybridization state, shape and magnetic behaviour of the following co-ordination entities on the basis of Valence bond theory.

- a) $[\text{Ni}(\text{CN})_6]^{4-}$ b) $[\text{Fe}(\text{CN})_6]^{4-}$ c) $[\text{Cu}(\text{NH}_3)_4]^{2+}$

Q17. Covert the following:-

- a) Toluene to benzylalcohol.
b) Benzene to p-bromonitrobenzene.
c) 2-bromopropane to 1-bromopropane.

Q18. Account the following

- a) Benzylchloride is more reactive than cyclohexyl chloride towards SN^1 -reaction.
b) Grignard reagent should be prepared under anhydrous condition.
c) Chlorobenzene has less dipole moment than chloroethane.

Q19. Write a short note on the following

- a) Hydroboration oxidation.
b) Reimer – Tieman reaction.
c) Williamson's synthesis.

Q20. Propose the mechanism involved in dehydration of ethanol to ethoxyethane.

Q21. Distinguish between the following pairs of organic compounds by suitable chemical test.

- a) propan-1-ol and propan-2-ol.
b) Butan-2-ol and 2 – methylbutan-2-ol.
c) phenol and benzylalcohol.

Q22. An organic compound with the molecular formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous Oxidation, it gives 1,2-benzenedicarboxylic acid. Identify the compound and Write the reactions involved.

Q23. Rajat and his father went to a shop to purchase a battery for inverter. Shopkeeper showed them two types of batteries, One with lead plates and other with cadmium plates. The cadmium battery was more expensive than the lead battery. Rajat's father wanted to purchase lead battery as it was cheaper.

- a) As a student of chemistry, Why would you suggest to Rajat's father to buy the cadmium plate battery. Give two reasons.
b) What are the values associated with the above decision?

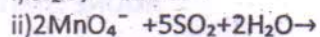
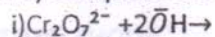
Q24. a) Define the following terms.

- i) Mole-fraction ii) Molal elevation constant (K_b)
b) Heptane and octane form ideal solution, at 373K, the vapour pressure of the two liquid components are 105.2 kPa and 46.8 kPa respectively. What will be the vapour pressure of a mixture of 26g of heptane and 35g of octane.

OR

- a) Distinguish between Minimum boiling azeotrope and maximum boiling azeotrope.
b) Determine the Osmotic pressure of solution prepared by dissolving 25mg of K_2SO_4 in 2 litre of water at 25°C , assuming that it is completely dissociated.

Q25. a) Complete the following equations:



b) Account for the following:

i) Zn is not considered as a transition element.

ii) Transition metals form a large number of complexes.

iii) Co(III) is stable in aqueous solution but in the presence of complexing reagents, it is easily oxidised.

OR

a) Write the chemical equations involved in preparation of $\text{K}_2\text{Cr}_2\text{O}_7$ from its important ore.

b) Out of Mn^{3+} and Cr^{3+} which is more paramagnetic and why?

c) Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

Q26. a) Write the products formed when $\text{CH}_3\text{-CHO}$ reacts with following.

i) HCN ii) $\text{H}_2\text{N-OH}$ iii) $\text{CH}_3\text{-CHO}$ in the presence of dilute NaOH.

b) Give the chemical tests to distinguish between the following pair of compounds.

i) Benzoic acid and benzyl alcohol.

ii) propanal and propanone.

OR

a) Account for the following :

i) $\text{Cl-CH}_2\text{COOH}$ is a stronger acid than CH_3COOH .

ii) Carboxylic acids do not give reactions of carbonyl group.

b) Write the chemical equations to illustrate following:

i) Rosenmund reaction

ii) Cannizzaro's reaction

iii) Hell Volhard Zelinsky reaction.