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# CBSE 12th Chemistry 2011 Unsolved Paper Outside Delhi

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TIME - 3HR. | QUESTIONS - 30

THE MARKS ARE MENTIONED ON EACH QUESTION

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SECTION – A

**Q.1. Write the equation showing the relationship between equivalent and concentrate of a strong electrolyte.** *1 mark*

**Q. 2. What is meant by 'shape selective catalysis'.** *1 mark*

**Q. 3. Differentiate between a mineral and an ore.** *1 mark*

**Q. 4. What is meant by 'lanthanoids contraction'.** *1 mark*

**Q. 5. Write the IUPAC name of the following compound:** *1 mark*

$CH_2 = CHCH_2Br$

**Q. 6. Draw the structure of 4-chloropentan-2-one.** *1 mark*

**Q. 7. How would you convert ethanol to ethene?** *1 mark*

**Q. 8. Rearrange the following in an increasing order of their basic strengths:** *1 mark*

$C_6H_5NH_2, C_6H_5N(CH_3)_2, (C_6H_5)_2$ and $CH_3NH_2$.

SECTION B

**Q. 9. Name the parameters that characterize a unit cell.** *2 marks*

**Q. 10. Calculate the packing efficiency of a metal crystal for a simple cubic lattice.** *2 marks*

**Q. 11. Calculate the mole fraction of benzene in solution containing 30% by mass in carbon tetrachloride.** *2 marks*

**Q. 12. What do you understand by the rate law and rate constant of a reaction? Identify the order of a reaction if the units of its rate constant are:** *2 marks*

(i) $L^{-1} mol\, S^{-1}$

(ii) $L\, mol^{-1}\, S^{-1}$

**Q. 13. The thermal decomposition of $HCO_2H$ is a first order reaction with a rate constant of $2.4 \times 10^{-3}\, s^{-1}$ at a certain temperature. Calculate how long will it take for three-fourths of initial quantity of $HCO_2H$ to decompose. (log 0.25 = -0.6021).** *2 marks*

**Q. 14. Describe the principal controlling each of the following processes:** *2 marks*

**(i) Vapour phase refining of titanium metal.**

**(ii) Froth floatation method of concentration of a sulphide ore**

**Q. 15. How would your account for the following:** *2 marks*

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

**(ii) In a transition series of metals, the metal which exhibits the greatest number of oxidation states occur in the middle of the series.**

**Q. 16. Complete the following chemical equation:** *2 marks*

**(i)** $MnO_4^-(aq) + S_2O_3^{2-}(aq) + H_2O(l) \longrightarrow$

**(ii)** $Cr_2O_7^{2-}(aq) + 6Fe^{2+}(aq) + H^+(aq) \longrightarrow$

**Or**

**State reasons for the following:**

**(i) Cu (I) ion is not stable in an aqueous solution.**

**(ii) Unlike** $Cr^{3+}, Mn^{2+}, Fe^{3+}$ and the subsequent other $M^{2+}$ ions of the 3d series of elements, the 4d and the 5d series metals generally do not form stable cationic species.

**Q. 17. Give the preparation and use of PVC (Polyvinyl Chloride)** *2 marks*

**Q. 18. Write the main structure difference between DNA and RNA. Of the four bases, name those which are common to both DNA and RNA.** *2 marks*

SECTION - C

**Q. 19. A solution prepared by dissolving 8.95 mg of a gene fragment in 35.0 mL of water has an osmotic pressure of 0.335 torr at** $25^0C$**. Assuming that the gene fragment is a non-electrolyte, calculate its molar mass.** *3 marks*

**Q. 20. Classify colloids where the dispersion medium is water. State their characteristics and write an example of each of these classes.** *3 marks*

**Or**

**Depict the galvanic cell in which the reaction**

$$2Zn(s) + 2Ag^+(aq) \longrightarrow Zn^{2+}(aq) + 2Ag(s)$$

**Take place. Further, show.**

**(i) Which of the electrodes is negatively charged?**

**(ii) the carries of the current in the cell.**

**(iii) individual reaction at each electrode.**

**Q. 21. How would your account for the following?** *3 marks*

**(i)** $H_2S$ **is more acidic than** $H_2O$

**(ii) The N - O bond in** $NO_2^-$ **is shorter than the N - O bond in** $NO_3^-$**.**

**(iii) Both O2and F2stabilize high oxidation states but the ability of oxygen to stabilize the higher oxidation state exceeds that of fluorine.**

**Q.22. Explain the following terms giving a suitable example in each case:** *3 marks*

**(i) Ambident ligand**

**(ii) Denticity of a ligand**

**(iii) Crystal field splitting in an octahedral field.**

**Q.23. Rearrange the compounds of each of the following sets in order of reactivity towards $S_{N}2$ displacement:** *3 marks*

**(i) 2-Bromo-2-methylbutane, 1-Bromopentane, 2-Bromopentane.**
**(ii) 1-Bromo-3-methylbutane, 2-Bromo-2-methylbutane, 3-Bromo-2-methylbutane**
**(iii) 1-Bromobutane, 1-Bromo-2, 2-dimethylpropane, 1-Bromo-2-methylbutane**

**Q. 24. How would you obtain the following:** *3 marks*

**(i) Benzoquinone from phenol**
**(ii) 2-Methylpropan-2-ol from methyl magnesium bromide**
**(iii) Propan-2-ol from propene**

**Q. 25. Name the reagents used in the following reactions:** *3 marks*

**(i) Benzyl alcohol to benzoic acid.**
**(ii) Dehydration of propan-2-ol to propene.**
**(iii) Butan-2-one to butan-2-ol.**

**Q. 26. Draw the structures of the monomers of the following polymers:** *3 marks*

**(i) Polythene**
**(ii) PVC**
**(iii) Teflon**

**Q. 27. Explain the term, target molecules or drug targets as used in medicinal chemistry.** *3 marks*

SECTION - D

**Q. 28. (a) What type of a battery is lead storage battery? Write the anode and cathode reactions and the overall cell reaction occurring in the operation of a lead storage battery.**

**(b) Calculate the potential for half-cell containing**

$$0.10M\ K_2Cr_2O_7(aq)\ MCr^{3+}(aq)\ and\ 1.0\times10^{-4}M\ H^+(aq)$$

**The half-cell reaction is**

$$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6e^- \longrightarrow 2Cr^{3+}(aq) + 7H_2O\ (l),$$

**And the standard electrode potential is given $E^0 = 1.33\ V$.** *5 marks*

**Or**

**(a) How many moles of mercury will be produced by electrolyzing 1.0M Hg $(NO_3)_2$ solution with a current of 2.00 A for 3 hours?[Hg $(NO_3)_2 = 200.6mol^{-1}$]**

**(b) A voltaic cell is set up at $25^0$C with the following half-cells $Al^{3+}(0.001M)$ and $Ni^{2+}(0.50M)$. Write an equation for the reaction that occurs when the cell generates an electric current and determine the cell potential.**

$$(Given: E^0_{\frac{Ni^{2+}}{Ni}} = 25^0, E^0_{Al^{3+}/Al} = -1.66V)$$

**Q. 29. (a) Complete the following chemical equations:** *5 marks*

(i) $HgCl_2 + PH_3 \longrightarrow$

(ii) $SO_3 + H_2SO_4 \longrightarrow$

(iii) $XeF_4 + H_2O \longrightarrow$

**(b) Draw the structure of**

(i) $(HPO_3)_3$

(ii) $BrF_3$

**OR**

**(a) What happens when**

**(i) Chlorine gas is passed through a hot connect rated solution of NaOH?**

**(ii) Sulphur dioxide gas is passed through an aqueous solution of a Fe (III)salt?**

**(b) Answer the following:**

**(i) Why is the basicity of $H_3PO_3$ and why?**

**(ii) Why does fluorine not play the role of a central atom in interhalogen compounds?**

**(iii) Why do noble gases have low boiling points?**

**Q. 30. (a) Illustrate the following name reactions:** *5 marks*

**(i) Cannizzaro's reaction**

**(ii) Clemmensen reduction**

**(b) How would you obtain the following:**

**(i) But-2-enal from ethanal**

**(ii) Butanoic acid from butanol**

**(iii) Benzoic acid from ethylbenzene**

**Or**

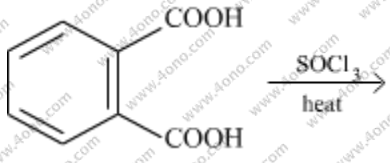
**(a) Give chemical tests to distinguish between the following:**

**(i) Benzoic acid and ethyl benzoate**

**(ii) Benzaldehyde and acetophenone.**

**(b) Complete each synthesis by giving missing reagents or products in the following:**

**(i)**




**(ii)** $C_6H_5CHO \xrightarrow{H_2NCONHNH_2}$

**(iii)**



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