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**CHEMISTRY COACHING CIRCLE**

S.C.O. 208 (TF) Sector 24-D, Chandigarh. Ph. No. 0172-2713289 (O).

**CHEMISTRY BOARD EXAMINATION PAPER -1 (Test-39)**

Time Allowed:

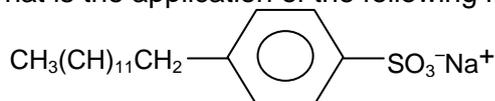
3 hours Maximum Marks: 70

**General Instructions:**

- All questions are compulsory.
- Questions number 1 to 5 are very short answer questions and carry 1 mark each.
- Questions number 6 to 10 are short answer questions and carry 2 marks each.
- Questions number 11 to 22 are also short answer questions and carry 3 marks each.
- Question number 23 is a value based question and carry 4 marks.
- Questions number 24 to 26 are long answer questions and carry 5 marks each.

1. What is the chemical name of antiseptic chloroxylenol ?

2. What is the application of the following molecule in everyday life ?



3. Name the polymer used for making medicinal Capsule.

4. Which vitamin is helpful in healing wound and cuts ? What is the chemical name of this vitamin?

5. Write the IUPAC name of  $[\text{Co}(\text{NH}_3)_4\text{Br}_2][\text{ZnCl}_4]$ .

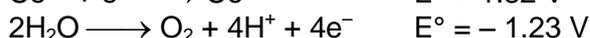
6. (i) Although  $-\text{NH}_2$  gp is an ortho and para directing gp, nitration of aniline gives ortho, para and meta derivatives.

(ii) Explain why is Chlorobenzene difficult to hydrolyse than ethyl chloride ?

7. (i)  $\text{SnO}_2$  forms a positively charged colloidal sol in acidic medium and a negatively charged sol in the basic medium. Why?

(ii) Why physical adsorption is multimolecular whereas chemisorption is unimolecular ?

8. Given that :



Explain why  $\text{Co}^{3+}$  is not stable in aqueous solution ?

9. (i) Iodine is more soluble in KI, than  $\text{H}_2\text{O}$ .

(ii)  $\text{R}_3\text{P} = \text{O}$  exist but  $\text{R}_3\text{N} = \text{O}$  can not exist.

10. Chloro acetic acid is a monoprotic acid and has (ionisation constant)  $K_a = 1.36 \times 10^{-3}$ . Calculate b.p. of 0.01 M aqueous solution? (Molal elevation constant is  $K_b = 0.51 \text{ k kg/mol}$ )

11. (i) Free energies of formation ( $\Delta_f G$ ) of  $\text{MgO}(\text{s})$  and  $\text{CO}(\text{g})$  at 1273 K and 2273 K are given below :

$$\Delta_f G \text{ MgO}(\text{s}) = -941 \text{ KJ/mol at 1273 K}$$

$$= -344 \text{ KJ/mol at 2273 K}$$

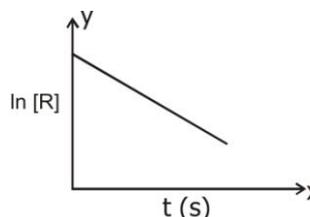
$$\Delta_f G \text{ CO}(\text{g}) = -439 \text{ KJ/mol at 1273 K}$$

$$= -628 \text{ KJ/mol at 2273 K}$$

On the basis of the above data, predict the temperature at which carbon can be used as reducing agent for  $\text{MgO}(\text{s})$ .

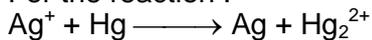
- (ii) In the process of extraction of gold, Roasted gold ore :
- $$\text{Roasted gold ore} + \text{CN}^- + \text{H}_2\text{O} \xrightarrow{\text{O}_2} [\text{X}] + \text{OH}^-$$
- $$[\text{X}] + \text{Zn} \longrightarrow [\text{Y}] + \text{Au}$$
- Identify the complexes [X] & [Y].
12. (a) Which of the following two compounds would react faster by  $\text{S}_\text{N}^2$  pathway : 1-bromobutane (OR) 2-bromobutane.
- (b) Allyl Chloride is more reactive than n-propyl Chloride towards nucleophilic substitution reactions. Explain.
- (c) Sulphanilic acid has acidic as well as basic group; but it is soluble in alkali but insoluble in mineral acids. Explain.
13. (i) Why are aliphatic amines more basic than aromatic amines ?
- (ii) How can we produce nitro benzene from phenol ?
- (iii) Di-tert butyl ether cannot be made by Williamson's synthesis. Explain why ?
14. (i) Why is  $\text{Cr}^{2+}$  reducing and  $\text{Mn}^{3+}$  oxidising when both have  $d^4$  configuration ?
- (ii) In  $\text{MnO}_4^-$  ion all the bonds formed between Mn and Oxygen are covalent. Give reason.
- (iii) Beside +3 oxidation state Terbium Tb also shows +4 oxidation state. (Atomic no. = 65)
- Or**
- (i) How do  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols differ in terms of their oxidation reaction and dehydrogenation ?
- (ii) A metal which is strongly attracted by a magnet is attacked slowly by the HCl liberating a gas and producing a blue solution. The addition of water to this solution causes it to turn pink, the metal is
15. (i) Arrange the following polymer in increasing order of their molecular forces :
- (a) nylon-6, 6, Buna-S, polythene.
- (b) nylon-6, Neoprene, polyvinyl chloride.
- (ii) Why should we always use purest monomer in free radical mechanism?
16. (i) How can tri substitution of Bromine be prevented in aniline?
- OR**
- How can we prepare mono bromo aniline?
- (ii) Explain the order of basicity of the following compounds in (i) Gaseous phase and (ii) in aqueous soln. :
- $(\text{CH}_3)_3\text{N}$ ,  $(\text{CH}_3)_2\text{NH}$ ,  $\text{CH}_3\text{NH}_2$ ,  $\text{NH}_3$
17. (i) Why are aldehydes more reactive than ketones ?
- (ii) Give the composition of Fehling A and Fehling B ?
- (iii) Name one reagent which can distinguish between 2-pentanone and 3-pentanone ?
18. (i) Why is Sulphuric acid not used during reaction of alcohol with KI?
- (ii) Arrange in order of property indicated:
- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$ ,  $(\text{CH}_3)_3\text{CBr}$ ,  $(\text{CH}_3)_3\text{CCH}_2\text{Br}$
- (Increasing boiling point)
- (iii)  $\text{CH}_3\text{F}$ ,  $\text{CH}_3\text{I}$ ,  $\text{CH}_3\text{Cl}$ ,  $\text{CH}_3\text{Br}$  (nucleophilic substitution)
19. (i)  $\text{K}_2\text{Pt}^{+4}\text{Cl}_6$  is well known compound and corresponding  $\text{Ni}^{+4}$  Salt is unknown? Whereas  $\text{Ni}^{+2}$  is more stable than  $\text{Pt}^{+2}$ .
- (ii) Why gold, Pt are dissolved in aqua Regia ?
20. For a certain chemical reaction variation in concentration in [R] VS time plot is given below. For this reaction write :

- (i) What are the units of rate constant ?
- (ii) Give the relationship between  $k$  and  $t_{1/2}$ .
- (iii) What does the slope of the above line indicate?



21. Give reasons for the following observations:
- Physisorption decreases with increase in temperature
  - Addition of alum purifies the water.
  - Brownian movement provides stability to the colloidal solution

22. For the reaction :



$$(\text{Ag}^+/\text{Ag}) \quad E^\circ = 0.80 \text{ V}; \quad (E_{\text{Hg}_2^{2+}/\text{Hg}}^\circ) \quad E^\circ = 0.79 \text{ V}$$

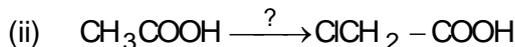
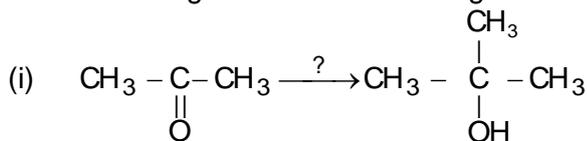
Predict the direction in which the reaction will proceed if :

$$[\text{Ag}^+] = 10^{-1} \text{ mol/h} \quad [\text{Hg}_2^{2+}] = 10^{-3} \text{ mol/h}$$

23. Give reasons :

- Window glass of old building look milky.
- Window glass of old building is thick at bottom.
- $\text{CaCl}_2$  will introduce Schottky defect if added to AgCl crystal.

24. Name the reagents used in following reactions:



- (iii) An element with density  $10 \text{ g cm}^{-3}$  forms a cubic unit cell with edge length of  $3 \times 10^{-8} \text{ cm}$ . What is the nature of the cubic unit cell if the atomic mass of the element is  $81 \text{ g mol}^{-1}$ ?

Or

Explain following name reactions

- Wolf Kishner Reduction
  - Sandmeyer Reaction
  - Cannizzaro Reaction
  - Iodoform Test
  - Carbylamine Reaction
25. A wellknown orange crystalline compound (A) when burnt impart violet colour to flame. (A) on treating (B) and conc.  $\text{H}_2\text{SO}_4$  gives red gas (C) which gives red yellow solution (D) with alkaline water. (D) on treating with acetic acid and lead acetate gives yellow ppt. (E). (B) sublimes on heating. Also on heating (B) with NaOH gas (F) is formed which gives white fumes with HCl. What are (A) to (F) ?
26. Explain:
- Why ZnO turn yellow on heating
  - Henry's law of solubility
  - What is the difference between schottky defect & Frenkel defect
  - Why lyophobic sols are less stable than lyophilic sols
  - Why  $\text{K}_3[\text{Fe}(\text{CN})_6]_{(\text{aq})}$  solution have lower B.pt. than  $\text{K}_4[\text{Fe}(\text{CN})_6]$

Or

- (a) Calculate the emf for the given cell at  $25^\circ\text{C}$   
 $\text{Cr}|\text{Cr}^{3+} (0.1 \text{ M}) || \text{Fe}^{2+} (0.01 \text{ M}) | \text{Fe}$   
[Given,  $E_{\text{Cr}^{3+}/\text{Cr}}^\ominus = -0.74 \text{ V}$ ;  $E_{\text{Fe}^{2+}/\text{Fe}}^\ominus = -0.44 \text{ V}$ ]
- What type of a battery is the lead storage battery? Write the anode and the cathode reactions and the overall reaction occurring in a lead storage battery when current is drawn from it.
  - Given an example of a fuel cell and write the cathode and anode reactions from it.