

ANDHRA EDUCATION SOCIETY SCHOOLS  
NEW DELHI  
SUMMATIVE ASSESSMENT-I (2015-16)  
CLASS - XII  
SUBJECT - CHEMISTRY

Time : 3:00 Hrs.

Max Marks : 70

**Instructions :** i. Questions 1 to 5 each carries one mark.

ii. Questions 6 to 10 each carries Two marks.

iii. Questions 11 to 22 each carries Three marks.

iv. Questions 23 carries four marks (Value based).

v) Questions 24 to 26 each carries Five marks.

1. Write the formula for the following coordination compound.  
Dichlorobis (ethane-1,2-diamine) platinum (iv) nitrate.

2. State the role of silica in the metallurgy of copper.

3. State Kohlrausch law of independent migration of ions.

4. Give evidence (chemical Test) to show that  $[\text{Co}(\text{NH}_3)_5\text{Cl}] \text{SO}_4$  and  $[\text{Co}(\text{NH}_3)_5\text{SO}_4] \text{Cl}$  are ionisation isomers.

5. Why is Zinc (At. no: 30) not considered as transition element?

6. Define Henry's law? Mention its two applications.

7. Write the isomers of the compound having formula  $\text{C}_4\text{H}_9\text{Br}$  and arrange them in the order of increasing  $\text{SN}^1$  reactivity.

OR

i) Write the structure of 4-test-Butyl-3-iodo heptane.

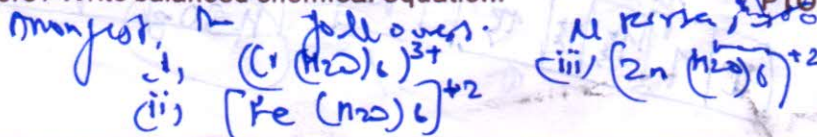
ii) Write the IUPAC name of  $\text{CH}_3\text{CH}=\text{C}(\text{Cl}) \text{CH}_2 \text{CH}(\text{CH}_3)_2$ .

8. Give one example of homogeneous and heterogeneous catalysis.

9. Write two differences between rate and rate constant of a chemical reaction.

10. Mention the conditions required to maximise the yield of ammonia by Haber process.

11. Describe the preparation of potassium dichromate from chromite ore? Write balanced chemical equation.



$\frac{1}{2} = 15$

$\frac{8-10}{2} = 20$

11/11

11/11

conducting var  
 Min  $\Delta_{cryst}$   $\Delta_{cryst}$   
 with  $\Delta_{cryst}$

Fe = 26  
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6 4p^0$

12. Explain giving reasons.
- i. Transition metals form large number of Coordination Compounds. [1][1][1][1]
  - ii. Many transition metals show variable oxidation states. [1][1][1][1]
  - iii) The Enthalpies of atomisation of transition metals are high.

13. i) Mention one chemical test for sulphur dioxide and write equation.  
 (ii) Write the structures of  $H_2SO_4$  and  $H_2S_2O_7$ . [1]

14. Outline the principles of refining of metals by the following methods (i) Zone refining (ii) Electrolytic refining (iii) Vapour phase refining. 15 2  
25 2

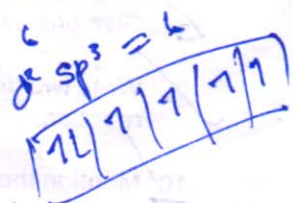
15. On the basis of valence bond Theory (VBT) predict the hybridisation state of metal and magnetic property of  $[Fe(H_2O)_6]^{2+}$  and  $[Fe(CN)_6]^{4-}$  (At - No. of Fe = 26). 21 6  
35 2  
3p 6  
ns 2  
3d 20

OR  
 Discuss briefly giving an example in each case the role of coordination compounds in  
 i) Biological systems (ii) Medicinal Chemistry.  
 iii) Extraction of metals. 4p  
5s

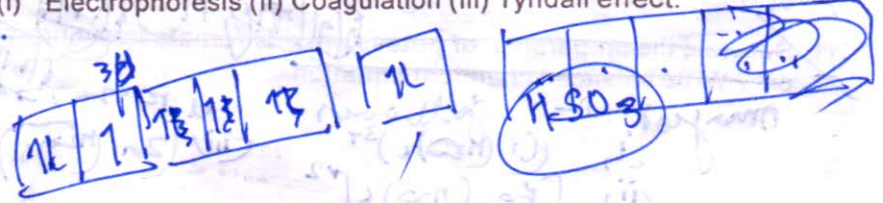
16. (i) How do antiseptics differ from disinfectants? Give one example for each.  
 (ii) Why is use of aspartame limited to cold foods and drinks.

17. How will you bring about the following conversions  
 (i) Aniline to Chlorobenzene.  
 (ii) But-1-ene to But-2-ene (iii) propene to propan-1-ol

18. Write the cell reaction and calculate the emf of the following cell at 298 K.  
 $Fe(s) / Fe^{2+} (0.001M) // H^+ (0.1M) / H_2 (1bar) / pt(s)$   
 $E^0 Fe^{2+} / Fe = -0.44V$



19. Explain the following terms.  
 (i) Electrophoresis (ii) Coagulation (iii) Tyndall effect.



20. The conductivity of  $0.001028 \text{ mol L}^{-1}$  acetic acid is  $4.95 \times 10^{-5} \text{ S cm}^{-1}$ . Calculate its dissociation constant if  $\Lambda_m^0$  for acetic acid is  $390.5 \text{ Scm}^2 \text{ mol}^{-1}$ .

21. Aluminium Crystallises in cubic close packed structure. Its metallic radius is  $125 \text{ pm}$ .

- What is the length of the side of the Unit cell.
- How many unit cells are there in  $1.00 \text{ cm}^3$  of Al.

22. What is a semiconductor? Describe the two main types of semiconductors taking example and contrast their conduction mechanism.

23. Mrs. Veena has two small children who crawl on the floor. She told her domestic servant Mrs Sonia that simple brooming the floor is not enough. After brooming she should sprinkle some phenylene (commercial name) on the floor and rub the floor with a clean cloth soaked in phenylene (It is also called phenyl). After reading the above passage, answer the following questions.

- What active chemical constituent does commercial phenylene contain and what are the advantages of its use.
- What values are displayed by Mrs. Veena by asking sonia to mop the floor with phenylene.
- Give a commercial method of preparation of the active constituent of phenylene.

24. (a) Define the following terms.

- Reverse osmosis
- Molality.

(b) A solution containing  $15 \text{ g}$  urea ( $\text{NH}_2\text{CONH}_2$ ) per litre of solution in water has the same osmotic pressure as the solution of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) in water. Calculate the mass of glucose present in one litre of its solution (At mass of  $\text{C}=12$ ,  $\text{O}=16$ ,  $\text{N}=14$ )

OR

(a) Define the following terms.

- Mole fraction
- Ideal solution.

(b)  $15 \text{ g}$  of an unknown molecular substance is dissolved in  $450 \text{ g}$  of water. The resulting solution freezes at  $-0.34^\circ\text{C}$ . What is the molar mass of the material? ( $k_f$  for water =  $1.86 \text{ K kg mol}^{-1}$ ).

Handwritten calculations for question 24(b):

$k_f = 1.86 \text{ K kg mol}^{-1}$

$\Delta T_f = 0.34$

$\frac{75}{3} = 25$

$273 - 0.34 = 272.66$

$\frac{450}{18} = 25$

$\frac{225}{9} = 25$

$\frac{450}{18} = 25$

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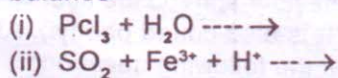
$\frac{225}{9} = 25$

25. (a) Define the following.
- order of a reaction
  - Molecularity of
- b) The rate constant for a first order reaction is  $60\text{S}^{-1}$ . How much time will it take to reduce the initial concentration of the reactant to its  $\frac{1}{16}$ th value.

OR

- a) Define the following.
- Activation energy
  - Effective collisions.
- b) The rate of a reaction quadruples when the temperature changes from  $293\text{K}$  to  $313\text{K}$ . Calculate the energy of activation of the reaction assuming that it does not change with temperature.

26. (a) Complete the following chemical reaction equations and balance



- (b) Account for the following.
- $\text{PCl}_5$  is more covalent than  $\text{PCl}_3$ .
  - The two O - O bond lengths in the ozone molecule are equal.
  - Helium is used in diving apparatus.

OR

- (a) Draw the structures of the following.
- $\text{XeF}_4$
  - $\text{PCl}_5$
  - $\text{SF}_4$
  - $\text{BrF}_3$
- (b) Account for the following.
- $\text{H}_3\text{PO}_3$  is dibasic / diprotic
  - $\text{NH}_3$  is more basic than  $\text{PH}_3$ .
  - Ozone is a powerful oxidising agent.

$$k = \frac{2.303 \log 2}{t_{1/2}}$$

$$k = \frac{2.303}{t} \log \left( \frac{a}{a-x} \right)$$