HISSAN CENTRAL EXAMINATION - 2080 (2024)

Class: XII **Subject: Chemistry** **Subject Code: 3021 D2**

F.M: 75 (11 Marks Obj+ 64 Marks Sub) **Time : 3hrs**

GROUP A

Multiple Choice Question **[11 × 1 = 11]**

Attempt all questions.

Rewrite the correct option in your answer sheet.

1. Which of the following is extensive property?
   a. Temperature b. Specific heat
   c. Heat d. Molar volume
2. Decrease in free energy of a reacting system indicates the reaction to be
   a. A reversible reaction b. An endothermic reaction
   c. A spontaneous reaction d. A non-spontaneous reaction
3. The specificity of enzyme results from their structure
   a. One dimensional b. Two dimensional
   c. Three dimensional d. Quarternary structure
4. A metal M displaces nickel from $NiSO_4$ solution but does not displace Mn from $MnSO_4$ solution.
   The correct order of reducing power is
   a. Mn> Ni > M b. Ni >Mn> M
   c. Mn> M > Ni d. M > Ni >Mn
5. The molecular formula of Rinmann's Green is
   a. $CoZnO_2$ b. ZnO.CO
   c. $ZnCO_3$ d. $ZnSO_4$
6. In the extraction of iron from haematite, the limestone acts as
   a. Reducing agent b. Flux
   c. Slag d. Oxidising agent
7. Nitration of chlorobenzene gives
   a. O-chloronitrobenzene b. P-chloronitrobenzene
   c. M-chloronitrobenzene
   d. Ortho and para- chloronitrobenzene

8. Which of the following compound gives iodoformtest ?
   a. Propanone b. Propanol
   c. Propanal d. Butanal

9. Dimerization of carboxylic acid is due to
   a. Covalent bond b. Vander Waal's bond
   c. Intramolecular hydrogen bond d. Intermolecular hydrogen bond

10. Acetic anhydride is reduced by $LiaAlH_4$ to give
    a. Ethanol b. Ethanoic acid
    c. Ethyl ethanoate d. Ethanol and ethanoic acid
11. Hydrolys of nitroethane gives
    a. Acetic acid and hydroxyl amine b. Methanol and nitrous acid
    c. Ethanol and ammonia d. Ethanal and nitrous oxide

GROUP B

Short Answer Question **[8 × 5 = 40]**

12. It is a crucial task to judge selection of indicator properly in acid-base titration.
    a. What are points to be considered while selecting an indicator properly? [1]
    b. Which indicator is best for titration between HCl and NaOH, why? [2]
    c. 4.9 g H_2SO_4 is present in 500 ml of its solution. Calculate (i) Normality (ii) Molarity. [2]

OR

Salt bridge is a U-shaped glass tube containing inert electrolytic solution
    a. Enlist functions of salt bridge. [2]
    b. What is the main criterian of electrolytes used in salt bridge. [1]
    c. Can a solution of 1 M $ZnSO_4$ be stored in a vessel made up of nickel? [2]

    Given,
    $E^0\ Ni^{++} / Ni = -0.25$ V and $E^0\ Zn^{++} / Zn = -0.76$V

13. P^H value measures the level of acidity or alkanity in aqueous solution.
    a. Define P^H of solution. [1]
    b. Derive the relation between P^H and P^{OH}. [2]
    c. Calculate the P^H of resulting mixture prepared by mixing equal volume of two solution with $P^H = 5$ and $P^H = 10$ respectively. [2]

14. Transition metals generally form coloured compounds. They have variable oxidation state and show catalytic activities.
    a. Why do transition metals form coloured compounds? [2]
    b. Transition metals have variable oxidation state, why? [1]
    c. Give the main reason behind the catalytic nature of transition metal. [1]
    d. Write any two example of inner transition metals. [2]

15. X is a metal that belongs to the first transition series and group 8 of the periodic table, which is second most abundant metal on the earth crust.
    a. Name the main ore of X. [1]

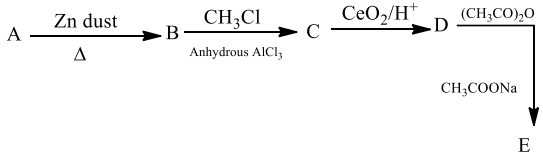
b. Mention the different zone developed inside the blast furnace during extraction of this metal with chemical reaction. [4]

16. a. How is primary alcohol prepared by oxo-process? [2]
    b. Why is boiling point of ethanol greater than its isomeric ether? [1]
    c. What happens when vapours of ethanol is passed over heated alumina at 250^0 C and 350^0 C respectively. [2]

OR

Write down the structural formula of primary, secondary and tertiary amine of each from C_3H_9N. How is Hoffmann's method applied to separate them from their mixture? [2+3]

17. A haloalkane having molecular formula C_3H_7X has two isomers A & B. Isomers B is obtained from secondary alcohol.
    a. Identify isomers A & B. [1]
    b. Convert Isomer A into B. [2]
    c. What happens when the secondary haloalkane is first reacted with alcoholic AgCNand followed by reduction with $LiAlH_4$? [2]
18. A list of compounds are as follows;
    Ethanol, Iodoethane, Ethyl cyanide, Propanoic acid, Propanoic anhydride
    From the above list of compounds, prepare a sequence of reaction chain with suitable conditions and reagents. [5]
19. Identify A, B, C, D and E in the following chemical reaction sequence.



The compound B can be obtained by heating sodium benzoate with soda lime.

GROUP C

Give long answers to the following questions. [3 × 8=24]

20. a. State and explain second law of thermodynamics. [3]
    b. "The decrease of enthalpy is not the sole criteria for the feasibility of the process". Justify the statement. [2]
    c. Calculate the heat of formation of naphthalene from the following data: [3]

$C(s) + O_2(g) \rightarrow CO_2(g)$, $\Delta H = -94.405$ KCal
$H_2(g) + 1/2\ O_2 \rightarrow H_2O(l)$, $\Delta H = -68.3$ KCal
$C_{10}H_8(s) + 12\ O_2(g) \rightarrow 10\ CO_2(g) + 4\ H_2O(l)$. $\Delta H = -1231.6$ KCal

OR

a. Define pseudo-first order reaction. [1]
b. Give an example of pseudo- first order reaction. [1]
c. What is meant by order of reaction. [1]
d. A first order reaction has half-life period of 69.3 seconds. What will be the rate of reaction when the concentration of reactant is 0.2 mole/L? [2]
e. Describe the Collision theory of reaction rate. [3]

21. a. An alkene (A) undergoes ozonolysis to give an aldehyde and ketone as the major products. The aldehyde and ketone are reduced with Zn-Hg/HCl to yield ethane and propane respectively. Identify (A) and give its IUPAC name. What product would you expect when (A) is treated with HBr? [4 +1]

    b. i What happens when aniline is shaken with aqueous Br_2? [1]
    ii Why is amino group of aniline protected before nitration? [2]

OR

Give an example of each of the following reaction. [8 × 1 = 8]

a. Diazotization reaction
b. Baeyer's reagent test
c. Reimer-tiemann's reaction
d. Benzoin condensation
e. Claisen condensation
f. Wurtz-fitting reaction
g. Gattermann's reaction
h. Iodoform test

22. a. Distinguish between antibiotics and sulpha drugs. What is tranquilizer? [2+1]
    b. Write the application of radioactivity in the field of chemistry and medicine. [2]
    c. i Give any two differences between OPC and PPC cement. [2]
    ii. Mention the role of gypsum in manufacturing of cement. [1]

THE END