Chemistry Set - 2 , NEB Grade XII

Time : 3 hrs **Full marks : 75**
Pass marks : 27

Group 'A'

Attempt any fifteen questions. [15 x 2 = 30]

1. How would you predict the geometry of ammonia molecule on the basis of VSEPR theory?
2. Which one has higher concentration?
   a. 80g/litre NaOH or 3M NaOH solution
   b. 5.3 g/litre Na_2CO_3 or N/10 Na_2CO_3 solution
3. Why is aqueous solution of $FeCl_3$ acidic?
4. Calculate the no. Of columbs required to deposit 40g of aluminium form molten $AlCl_3$?
5. Define state function and give two correct examples of it.
6. Comment on the statement "The decrease of enthalpy is not the sole critera for the feasibility of the process".
7. Write action of heat on white vitrol.
8. What are antibiotics? Write an example of broad spectrum antibiotic.
9. Give a chemical reaction for hydrolysis of di-peptide.
10. Define the terms:
    a. Activated complex b. Rate of reaction
11. Write an example of friedel craft acylation.
12. Identify A and B in the following reaction and give their IUPAC name.

$$CH_3 - CH = CH_2 \xrightarrow{HBr} A \xrightarrow[\text{dry ether}]{Na/\Delta} B$$

13. Give a suitable chemical test of ethanol that distinguishes it from propanol.
14. Write down isomeric ether of isopropyl alcohol and use Wiliamson's synthesis process for preparation of such ether.
15. Give an example each from aliphatic and aromatic aldehydes which gives Canizzaro's reaction.
16. Why is chloro-acetic acid stronger than acetic acid?
17. What happens when benzoic acid is nitrated?
18. Convert nitrobenzene into p-amino azobenze.
19. Write a chemical test to distinguish aliphatic amine from aromatic amine.
20. Point out any two diffrences between RNA and DNA.
21. What are natural and synthetic dyes? Give an example of each.
22. How is red oxide of copper converted into black oxide and viceversa.

GROUP 'B'

Attempt any five questions. [5 X 5 = 25]

23. How is diethyl ether prepared from laboratory.
24. What happens when Nitrobenzene is reduced in acidic, neutral, alkaline and electrolytic conditions?.
25. X gm of a metal (Equivalent weight=17) was completely dissociated in 100cc of N/2 HCl solution. The volume was then made upto 500cc. It is found that 15cc of the diluted acid solution required 17.5cc of N/10 NaOH for complete neutralization. Find the value of X.
26. What do you mean by degree of ionization? 0.41 gm of NaOH is placed in 100 ml of 0.1 N H_2SO_4. Find the pH of resulting solution.
27. Consider the following reaction.

$$A \xrightarrow[\Delta]{PCl_5} B \xrightarrow[\text{dry ether}]{Mg} C \xrightarrow{CO_2} D \xrightarrow[H_2O/H^+]{\Delta} E$$

The compound A is primary alcohol, which on oxidation gives ethanal. Identify A,B, C,D and E. Convert the above compound , A into methanol and ethyne.

28. Define activation energy. From the experimental data for the reaction:

$2A + B \longrightarrow 2AB$

Experiment	$[A]MolL^{-1}$	$[\boldsymbol{B}]MolL^{-1}$	Rate, $Mol^{-1}s^{-1}$
1	0.5	0.5	1.6×10^{-4}
2	0.5	1	3.2×10^{-4}
3	1	1	3.2×10^{-4}

i.Find overall order of reaction.
ii. Find rate constant.

29. Give chemistry of zinc white.

GROUP 'C'

Attempt any Two questions. [2X 10 = 20]

30. How is pure aniline prepared in laboratory? Identify the major products A,B,C and D in the following reaction sequence.

$$A \xrightarrow{\text{aq. NaOH+Br}_2} B \xrightarrow[0^0\,C]{NaNO_2+HCl} C \xrightarrow[HCl]{CuCl} D$$

The compound D if heated with chloral in presence of acid gives DDT.

31. a. Define the terms:
    i. Electrochemical equivalent
    ii. Standard electrode potential

b. How many columbs are needed to produce

i. 80g of aluminium from Al_2O_3 ?

ii. 24g of magnesium from $MgCl_2$

c. How is the free nergy of a reaction related to with the enthalpy change and entropy change? Discuss the criteria of spontanity and non-spontanity of a reaction on the basis of it's free energy change?

32. a. Show your acquaintance with Canizzaro's reaction and Perkin condensation.

b. How is ethanoic acid prepared from methyl magnesium iodide? What happens when ethanoic acid is :

i. Heated with P_2O_5

ii. Heated with HI in presence of red phosphorus

iii. Passes over heated MnO

iv. Warmed with ethanol in prescence of conc. H_2SO_4

33. Write short note on any two.

a. Distinction of primary, secondary and tertiary alcohol by Victor Meyer method.

b. Rusting iron and its prevention

c. Faraday's law of electrolysis

d. Application of commonium effect in qualitative analysis.

.....