SECOND TERMINAL EXAMINATION 2080

Subject : CHEMISTRY **GRADE XII (SCIENCE)** **F.M.: 75**
Time : 3:00 hrs. **SET B** **P.M. : 30**

Group 'A'

Choice the best answer. **[11×1=11]**

1. The molarity of a solution obtained by mixing 50 mL of 24 N Sulphuric acid with 50 mL of water is
   a) 12 M b) 6 M c) 9 M d) 24 M
2. The p^H of 10^{-7} M HCl is
   a) 7 b) 6.55 c) 7.3 d) 6.69
3. What mass of 90% pure $CaCO_3$ is required to neutralize 2 litre deci-normal solution of HCl?
   a) 9 g b) 10 g c) 11.11 g d) 10.11 g
4. 75% of a first order reaction was completed in 32 mins, when was 50% of the reaction completed?
   a) 24 mins b) 16 min c) 8 min d) 4 min
5. A blue colored salt of group II metal ion gives a blue precipitate with NaOH which on boiling gives black precipitate of
   a) Cu_2O b) CuO c) HgO d) ZnO
6. Which of the following species is Lewis acid
   a) CO_2 b) $AlCl_3$ c) Cu^{++} d) All of above
7. Alcohols react with Grignard reagent to form
   a) Alkane b) alkene c) alkyne d) all
8. The most acidic compound among the following is
   a) Phenol b) m-Cresol
   c) p-Nitrophenol d) 2,4,6-trinitrophenol
9. Diethyl ether on treatment with Cl_2 in presence of sunlight gives:
   a) Tetrachloro diethyl ether b) 2,2-dichloro diethyl ether
   c) Perchloro diethyl ether d) Diethyl peroxide
10. Cannizarro's reaction is not given by,
    a) Trimethyl acetaldehyde b) Acetaldehyde
    c) Benzaldehyde d) Formaldehyde
11. The compound which is not isomeric with diethyl ether is
    a) Butanone b) n-propyl methyl ether
    c) Butanol d) All are isomers

Group "B"

Answer the following questions: **[8×5=40]**

12. Solubility product is mainly used for detection of metal ions in qualitative analysis of basic radicals.
    i) Define solubility product constant. [1]
    ii) Write down two applications of it. [2]
    iii) If 80ml of 0.01M $AgNO_3$ are mixed with 20ml of 0.001M NaCl solution. Will AgCl precipitate or not? [K_{SP} for AgCl = 1.5×10^{-10}]
13. For a hypothetical reaction 2M+N → product. The following data are given

Exp. No.	Initial Conc. of M (Mol L^{-1})	Initial conc. Of N (Mol L^{-1})	Initial rate (Mol L^{-1} sec^{-1})
I	0.10	0.20	3×10^2
II	0.30	0.40	3.6×10^3
III	0.30	0.80	1.44×10^4
IV	0.30	1.60	A
V	0.60	0.80	B
VI	0.10	0.40	C

From the above data:
i) Find the over all order of the reaction.
ii) Calculate the value of A, B and C.

14. Zinc is considered as non-typical element and it belong to the element of group II B. [5×1=5]

i) Why are the elements of group II B called volatile metal?

ii) Name the process of concentration of zinc blende during the extraction of Zn.

iii) Write chemical reaction involved in roasting during extraction of zinc.

iv) What is meant by spelter zinc?

v) How is granulated zinc prepared?

15. Write down the chemistry of blue vitrol. [5]

16. i) Derive Normality equation. [2]

ii) 1g of NaOH is added to 2 litter of xM H_2SO_4 solution, so that P^H of the resulting solution is 7. Find the value of X. [3]

17. Write down the isomeric alcohols of $C_4H_{10}O$ and give their IUPAC name. Explain victor-meyer's method to distinguish them.

18. Write the resonating structure of Nitro-benzene and explain why does it give meta substituted product during electrophilic substitution? How is nitro benzene converted to P-hydroxyazobenzene. [1+2+2]

19. Identify A, B, C, D and E in the following reactions sequences. [5]

$$(A) \xrightarrow[Conc.\ H_2SO_4]{Conc.HNO_3} (B) \xrightarrow[\Delta]{Sn/HCl} (C) \xrightarrow[\Delta]{CHCl_3/KOH^{(alc)}} (D) \xrightarrow[\Delta]{Li\ AlH_4} (E)$$

Compound A can be obtained by heating phenol in presence of Zn–dust.

Group "C"

Answer the following: [8×3=24]

20. i) Derive the relationship between P^H and P^{OH}. Calculate the P^H of a saturated solution of $Mg(OH)_2$, K_{SP} for $Mg(OH)_2$ is 8.9×10^{-12}. [2+2]

ii) State ostwald's dilution law. The P^H of 0.1M HCN solution is 5.2. What is value of ionization constant (Ka) for the acid. [1+3]

21. There are three possible isomeric amines of C_3H_9N.

i) Draw the structural formula of the isomer and predict the order of there increasing basic strength in gas medium. [2]

ii) How would you distinguish these isomers by using nitrous acid test? [2]

iii) Separate these isomers by using Hoffmann's method. [4]

22. An unsaturated hydrocarbon (C_3H_6) undergoes markovnikov's rule to give (A). Compound (A) is hydrolyzed with aqueous alkali to yield (B). When (B) is treated with PBr_3, compound (C) is produced. (C) reacts with AgCN(alc) to give compound (D). The compound (D) if reduced with Li AlH_4 produce (E). [1+5+1+1]

i) Define markovnikov's rule.

ii) Identify (A), (B), (C), (D) and (E) with chemical reaction.

iii) How does. E react with nitrous acid.

iv) How would you convert (B) into C_3H_8.